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ABSTRACT

This issue contains five articles that address environmental concerns. "Poverty and Environmental Decline" (Alan Durning) analyzes accelerating environmental decline and discusses the need for action at every level to reverse global deterioration. "Integrated Pest Management (IPM) Made Easy" (Cesar Galvan, Peter Kenmore) explains how Filipino nongovernmental organizations (NGOs) are spearheading a new training approach to make IPM training accessible to local rice farmers. "Popular Epidemiology" (Phil Brown, Dick Clapp) is a report on the politics of organizing against toxic waste-induced disease in Woburn, Massachusetts. "Toxic Trade-Off" outlines the growing business in toxic waste products between the northern and southern areas of the world. "Less Is More" (Miguel Altieri, Andres Yurjevic) examines the problems of peasant agroecological methods on peasant farming communities. The issue also includes "Reports on...Natural Resources and Economic Opportunity: Lessons from the Sahelian Experience" (Asif Shaikh, Kjell Christophersen), two book reports, and "From the Field: Indonesia's Batefoot Environmental Impact Assessment" (Davis Baltz). (NLA)

REPORTS

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World Education

Editorial

The 1980s were a watershed for the environmental protection movement worldwide. Growing problems, new data and better communications have raised the public consciousness around environmental issues as never before. There is an increasing awareness of the need to take urgent action as the realization dawns that many of our resources are not renewable and that they are rapidly being depleted.

At the same time, it is clear that the protection of our environment, like many things we care about, is ultimately a political issue. Protecting the environment inevitably becomes a question of by whom and for whom and is often framed as a choice between ecological concerns and what are seen as the more pressing issues of economic development. Environmental preservation, however, is *not* a trade-off for economic growth and the elimination of poverty in the South, but rather, these two issues are inextricably bound together. Without serious attempts to preserve the environment, meaningful economic growth and sustainable development become less and less feasible. Similarly, the elimination of poverty is a crucial step towards environmental preservation as poor people often have no choice but to destroy the very ecosystems on which they depend.

As the links between economic development and environmental stewardship become clearer, it is crucial that the unsustainable development strategies which have emerged in many industrial countries in the North are not repeated as the South maps its own development path. The question in the nineties is no longer whether environmental issues are a valid consideration, but rather "how" economic development should take place in order that these issues are taken into account.

One of the keys to real progress towards sustainable development is to give people an active voice in the decisions which will affect their lives. Despite the bleak economic outlook for southern nations in the 1980s and even bleaker forecast for the 1990s, the past decade has witnessed an unprecedented upsurge of successful grassroots and community-based movements working on poverty and environmental issues, demonstrating the vital importance of local participation in social change. In many countries NGOs in particular have acted as the starting points for such efforts.

This issue of ***Reports*** charts some of these activities. Two policy pieces, one by Alan Durning and the other by Asif Shaikh and Kjell Christopherson, provide a framework for a variety of case studies and attempt to raise the issues in the debate about the relevance of environmental action to economic development. We then focus on a number of local NGO initiatives in different countries to illustrate both their dynamism and their growing role in addressing both local and global environmental issues.

No longer can any of us view our "development" programs as separate from wider environmental issues. We must all act—as policy makers, as NGOs, as local communities and as individuals. World Education's own environmental portfolio is expanding as we become more directly involved in these issues. Our current activities include evaluation and nonformal education training services to the FAO Intercountry Program in Integrated Pest Control (IPC) in Rice in Asia. With funding from USAID, World Education is also assisting grassroots organizations in Indonesia to develop and carry out public education campaigns that advocate policy changes in pesticide usage and alter farmer and family behavior. In the Sahel, World Education is conducting workshops for NGO communities in Mali, Senegal and Cape Verde that strengthen the ability of local groups to manage environmental programs.

These articles offer innovative, replicable approaches to address the environmental concerns that affect us all. We hope they encourage further efforts to seriously consider these issues, and actively respond to them.

The Editors

Reports

Number 29; Winter 1991

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Poverty and Environmental Decline

Countering global deterioration means grassroots action

by Alan Durning

"During the anticolonial campaigns we were told that development would mean better living conditions. Several years have gone by, and all we see are people coming from the capital to write about us. For me the hoe and the water pot which served my grandmother still remain my source of livelihood. When I work on the land and fetch water from the river, I know I can eat. But this development which you talk about has yet to be seen in this village." These words, spoken by a Kenyan woman a decade ago, remain true for most of the world's poor. Over the last ten years things have only become worse.

For the poor of Africa, Latin America, and parts of Asia, the 1980s were a time of cruel reversals, a period when the global economy seemed to conspire against them. On top of the runaway population growth and accelerating environmental decline that were already dragging down living standards across the Third World, prices for poor nations' exports plummeted, and international debt siphoned a growing share of their income into the hands of foreign financiers. The poor, in short, earned less and paid more. Consequently, they ate less.

Developing nations' debt of $1.2 trillion caused a reversal of the flow of international capital. Today, poor nations are paying rich ones $50 billion each year in debt and interest payments beyond what they receive in new loans. Capital flight from wealthy people in poor lands may bring the exodus up to $100 billion each year. Trade protectionism in industrial countries results in annual losses on a similar scale, as Third World export prices fall and markets shrink.

This massive hemorrhage of financial resources from poor regions only augments their destruction of natural resources. Poor countries are forced to exploit mineral deposits, forests and fisheries to meet debt obligations. And they are left with few resources to alleviate poverty. The poor turn to the only means of survival available to them: marginal lands. They plow mountain slopes, burn plots in tropical forests, and overgraze grasslands, often knowing full-well that their actions are destructive to the environment and therefore cannot last. Shridath Ramphal writes,

Poor people often destroy their own environment—not because they are ignorant, but to survive. They overexploit thin soils, over-graze fragile grasslands, and cut down dwindling forest stocks for firewood. In the context of the short-term needs of an individual, each decision is rational; in a long-term and wider context, the effects are disastrous...Poverty is both a cause and an effect of environmental degradation.

Close to half of the absolute poor now live in regions of marginal agricultural productivity, where they are falling into a downward spiral of ecological and economic impoverishment. The stark choice for the dispossessed, trapped as they are in stagnant economies that are exporting precious resources to pay bank debts, is between sacrificing their environment and sacrificing their children. There is no line that can be drawn between economic development and environmental protection.

Protecting the Local Environment

As officials in northern and southern capitals alike grow increasingly aware that a healthy resource base is a precondition to real social and economic progress, a stream of self-described "sustainable development" projects has begun to flow from the pens of development planners. However, the fundamental questions of sustainable development are *by whom?* and *for whom?* Sustainable development imposed from on high is rarely sustainable; it may not even be development. For development to help the poor, it must put them first not only as intended beneficiaries, but as active participants, advisers, and leaders. True sustainable development does not simply provide for the needy, it enables them to provide for themselves.

Settled communities generally understand the necessity of protecting the natural resources that sustain them, and over generations, local resource management regimes have evolved. Around the world, many of these ancient systems survive, struggling to maintain the balance between humans and nature. In the flooded pastures along the Niger River of Mali, for example, local and nomadic herders employ elaborate calendars and rotation systems to graze millions of livestock without destroying the land. In the north of Mali, meanwhile, forests have traditionally been managed according to the simple rule that small branches can be cut as fodder for lambs and kids but not for mature animals. Village children provide the eyes of the law, reporting infractions to their elders, who quickly penalize violators by confiscating the best breeding male in their flock. Similar systems are in varying states of health worldwide, from wildlife management in Zaire to soil protection in the Andes.

While historical evidence shows that traditional resource management has never worked perfectly, in modern circumstances three forces have overwhelmed it: governments have undercut local authority, powerful newcomers have put short-term profits before long-term sustainability, and community members themselves have been forced to sacrifice the future to salvage the present when their population surpasses the land's carrying capacity. Communities respond to these challenges with varying success.

Over the course of this century, a procession of new nations, freed at last from colonial bonds, have followed in their colonizers' footsteps by declaring the nation's common resources the exclusive domain of the state. In each case, the same spiral of decline has resulted. When authority over ranges, forests, and fisheries is vested in weak or corrupt ministries in the capital, the tragedy of the commons—in which uncontrolled individual interests undermine the common good—plays itself out in the hinterlands.

Communities are both more apt and better able to protect their environment against newcomers who exploit it. These "outsiders" provide a visible adversary against which to mobilize, bringing out defense instincts in local groups. Traditional fishermen of northeastern Brazil, the Philippines, and the Indian states of Goa and Kerala, for example, are organized to battle commercial trollers and industrial polluters who deplete ocean fisheries. The people of the world's disappearing tropical forests, from the Congo to Kalimantan, have begun defending their homes as well, despite a pace of destruction that makes their task a daunting one.

The world's most acclaimed community forest movement, Chipko, shows how grassroots action to defend a resource can grow into far more. Born in the Garhwal hills of Uttar Pradesh, India, Chipko first drew fame for its sheer courage. In March 1973, as a timber company headed for the woods above impoverished Gopeshwar village, desperate local men, women, and children rushed ahead of them to *chipko* (literally "hug") the trees, daring the loggers to let the axes fall on their backs. Since its initial success, the movement has deepened its ecological understanding and gone beyond resource protection to ecological management, restoration, and what members call "eco-development". The women who first guarded trees from loggers now plant trees, build soil-retention walls, and prepare village forestry plans.

Groups organize most readily to defend their resource base against the incursion of outsiders, but in the right circumstances they may organize to reverse deterioration driven by forces internal to the community. As Kenya's forests shrink, thousands of women's groups, youth clubs and *harambee* (let's pull together) societies have mounted local tree planting drives. The National Council of Women of Kenya inaugurated its Greenbelt Movement in 1977, calling on women's groups across the country to turn open spaces, school grounds, and roadsides into forests. Over a million trees in 1,000 greenbelts are now straining skyward.

An African federation popularly known as Naam is among the most successful of the world's grassroots movements at mobilizing people to protect and restore natural resources in an area degraded from overuse. Building on pre-colonial self-help traditions, Naam taps vast stores of peasant knowledge to loosen the grip of poverty and ecological deterioration in the drought-prone Sahel. With origins in Burkina Faso, it now spills over under different names into Mauritania, Senegal, Mali, Niger, and Togo.

Wealthy Nations Face Pollution Not Depletion

The people of wealthy nations do not live in biomass-based economies. Their dependence on natural systems is buffered by the long chains of commerce and industrial production. The industrial economy is too new and too complex to be regulated by traditional practices; its environmental side effects can only be controlled by law. The environmental threats of industrialization that directly impinge on communities, moreover, are not typically resource depletion but pollution. All of these factors make industrial-country community action markedly different from Third World self-help.

In the United States in the Bronx, New York, Patricia Nonnon and her neighbors, alarmed at the high incidence of various diseases in their community, are demanding the clean-up of an abandoned hazardous waste dump. The pesticides that saturate the San Joaquin Valley of California take their toll on local children, where cancer rates among children are eight times the expected incidence. Local mothers in the community have demanded action from state officials. In Seattle, Washington, plans to construct a waste incinerator ignited such opposition from community groups that the municipal government opted for a city-wide recycling program.

In Poland, nearly half of the nation's water is classified as unfit even for industrial use, and the Polish Academy of Sciences projects that there may be no safe drinking water in Poland by the turn of the century. The fast-growing Polish environmental movement has not failed to respond. In late 1986, one of the most daring groups, Freedom and Peace, mobilized in the city of Wroclaw to demand closure of a steel mill that was endangering their drinking water. After three public protests, two of which were broken up by police, the government decided to shut the plant by 1992.

Some environmental threats, while they have local causes, have consequences that are delayed several decades and are spread around the globe. Indeed, these perils may come to dominate the decades ahead. Grassroots movements today face the challenge of extending their vision beyond tangible local prob-

lems to invisible global ones. Unprecedented dangers call for unprecedented foresight; they also call for new relationships between the grassroots and broader institutions.

From the Bottom and the Top

Despite the heartening rise of grassroots action, humanity is losing the struggle for sustainable development. For every peasant league that stanches the hemorrhage of topsoil from a watershed, dozens more fail. For each neighborhood that rallies to replace a waste incinerator with a recycling program, scores remain mired in inaction. Spreading today's grassroots mobilization to a larger share of the world's communities is an indispensable step toward putting an end to the global scourges of poverty and environmental degradation. Indeed, while national development in the orthodox model places primacy on accumulating capital and improving technology, sustainable development is built first on the mobilization of people.

All local groups, however, eventually collide with forces they cannot control. Peasant associations cannot enact supportive agricultural policies or build roads to distant markets. Women's groups cannot rewrite bank lending rules. Neighborhood committees cannot implement city-wide recycling programs. Thus, perhaps the greatest irony of community action for sustainability is that communities cannot do it alone.

The largest challenge in reversing global deterioration is to forge an alliance between local groups and national governments. Only governments have the resources and authority to create the conditions for full-scale grassroots mobilization. In the rare cases where national-local alliances have been forged, extraordinary gains have followed. South Korea and China have used village-level organizations to plant enormous expanses of trees, implement national population policies, and boost agricultural production. Zimbabwe has trained over 500 community-selected family planners to improve maternal and child health and control population growth. After the 1979 Nicaraguan revolution, a massive literacy campaign—a combination of community-based and government organization—raised literacy from 50 to 87 percent. During World War II, millions of Soviet, American, Asian and European civilians recycled materials, conserved energy and planted victory gardens to boost food production. Today, the threat to global security from environmental degradation merits a similar mobilization of local and national forces.

It is clear that grassroots-government alliances cannot be formed where governments do not want them. Few leaders are committed to promoting popular organizations. Government's first concern is almost always to retain power and independent-minded grassroots movements may seem more of a threat than an ally. Inevitably self-help will clash with these forces, but that does not lessen the importance of grass-roots organizations. To the contrary, the best hope for pressing governments to work with local groups is local groups themselves. Indeed, over the long run, community groups could fundamentally alter the world's political landscape. Self-help organizations formed in Philippine slums in the seventies, for example, played an important role in the toppling of the Marcos dictatorship in 1986.

The motto of grassroots development that emerged from the seventies was "Give a man a fish and you feed him for a day, teach him to fish and you feed him for a lifetime". That aphorism turned out, however, to be triply flawed. First, women—even more than men—were the ones who needed fish; second, the rich controlled the fishing rights; and third, fish stocks were dwindling. Because self-reliant localism cannot tackle the broader issues of resource distribution, legal rights, and ecological decline, many self-help movements have turned increasingly to political struggle, bringing them more into line with industrial-country environmental groups that have long operated by political means.

At base, grassroots action on poverty and the environment comes down to a question of the rights of people to shape their own destiny. The United Nations-sponsored World Commission on Environment and Development is unequivocal on this question, "The pursuit of sustainable development requires a political system that secures effective citizen participation in decision making." Around the world, community organizations are doing their best to put this participatory vision into practice, and they are simultaneously posing a yet deeper question. In the world's impoverished South it is phrased, "What is development?" In the industrial North it is, "What is progress?" Behind the words, however, is the same refrain—What kind of lives shall our people lead? What kind of world shall we leave to our children?

At the grassroots, campaigns are underway on every continent. Whether these scattered beginnings rise in a global groundswell depends only on how many more individuals commit their creativity and energy to the challenge. The inescapable lesson for each of us is distilled in the words of Angeles Serrano, a grandmother and community activist from Manila's Leveriza slum. "Act, act, act. You can't just watch."

Alan B. Durning is a Senior Researcher at the Worldwatch Institute. His research focuses on local initiatives to address global problems. He is the author of Worldwatch Paper 88 *Action at the Grassroots: Fighting Poverty and Environmental Decline* and of Worldwatch Paper 92 *Poverty and the Environment: Reversing the Downward Spiral*. This article is drawn from both these two longer papers.

IPM Made Easy

Training in the field...

by César Galvan and Peter Kenmore

Leaving their shoes and socks on the paddy's edge, the group slowly waded, nearly knee deep in mud and water, to the center of the field of tillering rice. On a cue from the extension agent, they each bent over and gently tapped the outside base of a rice plant. Pulling back the canopy so as to expose the water's surface to the sunlight, members of the group began to count the number of insects present on the surface of the water. "Four brown planthoppers, one stemborer, three leaf rollers. Not bad," they said to each other, "no serious problems with insect pests here."

Counting insects is only one part of the training that nongovernmental organization (NGO) staff are receiving in the Philippines today. These NGO staff are becoming a vital part of a network of trainers, barefoot agriculturalists otherwise known as para-aggies, and IPM (Integrated Pest Management) scouts working with individual farmers and farmers' groups who have a growing concern about environmental problems. They are searching for effective approaches to deal with these issues, especially the problem of pesticide misuse.

NGOs and IPM

Many nongovernmental organizations in the Philippines are keenly aware of an increasing environmental consciousness among local communities and are spearheading campaigns on many environmental issues. One of the major concerns of NGOs throughout Southeast Asia is the increasing dependency, overuse and misuse of pesticides by farmers. In many areas, treatment with pesticides is the sole strategy for controlling pests, despite the fact that pesticide use does not have a direct relationship with an increase in rice yields nor with an increase in profits. It has, however, allowed pests to develop resistance to agrochemicals, consequently requiring stronger dosages and more frequent applications. This in turn has contributed to the breakdown of natural ecosystems and destroyed insects which are the natural enemies of pests.

Many environmentally-hazardous insecticides and herbicides which are banned or restricted in industrialized countries are widely available in developing countries. In the Philippines, for example, substances such as methyl parathion and endrin, which have been classified by the World Health Organization as "extremely hazardous", are still widely used in the provinces even though they have technically been banned. The problem is compounded by a lack of legislation addressing pesticide use, dilution of pesticides by retailers, poor labelling, inadequately-funded government enforcement, and widespread ignorance of the dangers by the public.

Philippine NGOs felt an urgent need to develop effective, alternative approaches. They have joined hands in an effort to reverse the trend toward environmental deterioration and endangered public health posed by indiscriminate pesticide use. They have begun to combine old and new agricultural practices in a system called Integrated Pest Management (IPM).

The United Nations Food and Agriculture Organization (FAO) defines IPM as a pest management system that, in the context of the specific environment, utilizes all suitable techniques to control pest populations at levels below thresholds causing economic injury. The experience shows that a mix of biological, physical, cultural, and chemical control tactics for any given pest problem is the most effective in ensuring stable yields, higher profits, less damage to human health, and avoidance of pest outbreaks. IPM gives direct and visible benefits—it is an economically and ecologically sound technology which improves living standards of marginal farmers and minimizes health and environmental hazards in their communities.

National NGO Training

Innovative activities now underway in the Philippines promote greater community involvement in environmental issues while at the same time supporting agricultural and environmental messages from the public sector.

The FAO Intercountry Programme in Integrated Pest Control in Rice has organized intensive IPM field training for large Philippine NGOs working in the

agricultural sector. Representatives and staff of major NGOs from throughout the country have attended the trainings to strengthen their field IPM activities. These national trainings constitute the first step in a process that brings an understanding of IPM and how to use it to the community level.

Once an NGO makes the commitment to work on IPM and has attended a national level workshop, there is a process which NGOs use for conducting training in their own communities. With the help of the FAO Intercountry Programme, the first to undergo IPM training are local NGO staff in what is essentially a training of trainers. This cadre of NGO staff can then be tapped to serve as training resource persons during training in the villages.

Field work is emphasized, and in fact seventy percent of the training is in the field. Participants collect and identify pest and beneficial insects, weeds, and plants that exhibit symptoms of nutritional deficiencies, disease, and insect damage. Working in the field encourages the participants to closely observe the density of insect populations, and makes them more adept at recognizing damage and disease symptoms.

Among the many training approaches are exercises using the "snapshot technique" and the "plant-by-plant assessment." With the snapshot technique, participants are taught to examine a portion of a rice field to decide whether the crop has reached the "pest action level" where an intervention is necessary. With the plant-by-plant assessment, the participants rigorously examine and catalog the damage of pre-marked, staked plants.

Demonstration plots to conduct verification trials are set up by each NGO to further study and adapt IPM technology and training to local conditions. The primary objective of the "demo-plots" is to serve as a show place for all farmers in the village in an effort to raise awareness among the villagers and to create demand for IPM training. In addition, these "farmer laboratories" enable local people to monitor the effects of IPM and compare the results with their own fields.

NGO enthusiasm for IPM training is at times so strong that staff begin training farmer beneficiaries even before they have finished their own verification trials.

"Para-Aggie" Training

Once NGOs have a capacity to deliver IPM training, they in turn train "para-aggies." Participants in the para-aggie training programs are representatives of different grassroots People's Organizations (POs) affiliated with an NGO. As in the NGO trainers' training, participants will become resource persons during village training when they return to their own communities. Likewise, they will in turn set up demo-plots in strategic parts of their villages to conduct their own verification trials to educate local farmers about IPM methodology.

Para-aggies go by different names depending on the region of the country. They are known as para-aggies in the eastern and southern parts of the largest Philippine island of Luzon, and in some areas of the island of Mindanao in the south. In northern Luzon, they are called "local technicians," while in central Mindanao, they are distinguished as "barefoot agriculturists."

IPM Scout Training

Within each group of para-aggies, two or three (depending on the size of the village) are nominated by their fellow para-aggies to become full time IPM scouts. The scouts are usually out-of-school youth or middle-aged farmers who have excelled during the para-aggie training. The scouts undergo additional IPM training to sharpen their skills in identifying insect damage and hone their visual skills in the snapshot assessment.

When the scouts are ready, they become responsible for monitoring the community's rice fields for possible pest outbreaks. Each scout is assigned a parcel of land where he or she does pest sampling about twice a week. If they are unable to identify certain problems in the field they are assisted by the staff of the local NGO or other resource persons. After every cropping season, the scouts file a report and hold a meeting with local farmers to discuss recommendations and steps for the future.

The remuneration of the scouts

depends on the capability of the sponsoring NGO. In some cases, IPM scouts are paid in cash, but more likely they receive fresh chicken eggs, carabao (water buffalo) milk, vegetables, or fruits for their services.

Farmer Training

Local farmers are the ultimate beneficiaries of all the preparation and training since they are the end users of the IPM technology and it is they who actually raise the crops. The farmers' training initially lasts for two days with one night session.

As in the other trainings, the farmers' training is comprised largely of field work. It is not surprising to see farmers arrive for the first training session wearing their best pants, a polo shirt, and a pair of shoes. They explain that they are used to attending seminars inside the classroom. However, they are quick to remove their shoes and roll up their pants and sleeves when asked to move into the rice field.

The farmers like the idea of training in the field because they are able to share their experiences in field monitoring and decision-making instead of "being talked at." Perhaps even more important, they like to see the trainers working in the paddy!

To reinforce the interest that the farmers show in IPM training, and to encourage productivity and training excellence, outstanding farmer participants are given awards for their initiative during simple closing ceremonies at the completion of training. The awards are usually booklets or handouts which present IPM information in easy-to-use formats. Invariably, the awardees share their prizes with their fellow farmers who want to consult the booklets for solutions to pest problems.

To evaluate the training, the "ballot box" technique is used, whereby farmers progress through a series of stations in the rice paddy. Each station asks a question about a field problem or condition that the farmers have been studying. The farmers "vote" privately in response to each question, dropping their answers into a ballot box at each location. This technique not only fills gaps in farmers' knowledge, but also reinforces farmers' confidence in their own abilities since the evaluation is non-threatening.

The success of the training can be seen from farmer reactions. In Quezon province, for instance, farmers have changed their farming habits to essentially eliminate the use of any kind of synthetic pesticides. Instead, they are relying on traditional knowledge and pioneering new techniques to use the natural repellant properties of selected local plants as alternatives to chemicals. In fact, farmers in Infanta Town have created some combinations which are so potent that local trainers have been forced to discourage their experiments.

In many places in the Philippines, villagers who have received IPM exposure are so impressed that they are now asking for IPM training in vegetables and other crops besides rice. In some places, it is now difficult to compare the results in demonstration plots with farmers' land because so many farmers have adopted IPM practices.

Post-Training Activities

The follow-up process in IPM is crucial both to solidify the learnings of the community as well as to provide ongoing support for further refinement of IPM practices. The morale and camaraderie of fledgling IPM practitioners is already high, and follow-up maintains this enthusiasm. These activities begin right after the training

If a demonstration plot is planned, immediate assistance is directed toward planning and implementing field trials. To convince skeptical members of the community about the value of IPM, it is important that they can see the results for themselves. As the demo-plots become established, local adaptations of "economic threshold levels" and "pest action levels" are determined and explained, while specific pest control interventions, which may be unfamiliar to local farmers, can be demonstrated. Farmers must be able to recognize the point where action is needed to prevent undue losses while not resorting to chemical interventions as their first and only option.

Another follow-up activity is documenting the training and post-training experience. Using a participatory research process, NGOs and local communities are conducting surveys and case studies in specific locations on the impact of IPM on the environment, changes in how people view health problems, new farming practices, the diffusion of IPM, and the effects of IPM awareness campaigns. Furthermore, NGOs gain valuable feedback from farmers about the IPM extension program by listening to the community's observations on training methods, materials, and trainers.

Efforts to expand and enhance the NGO network in IPM are ongoing. For example, an NGO IPM newsletter is now in circulation, and there are plans for standardizing the IPM curricula. Fresh contacts with NGOs who are interested in IPM training for their staff and farmer beneficiaries are encouraged and pursued. Within a year, the number of NGOs who have received IPM training is expected to double.

Linkages with other institutions such as government agencies, agricultural schools, and universities are being strengthened. Prior to the current explosion of NGO interest in IPM, there was very little, if any, contact between NGOs and Department of Agriculture personnel. Now the trend is towards collaboration so that local communities sense there is consensus about the need to reduce harmful pesticide use. These ties facilitate the exchange of ideas and research data, as well as help to develop new training methods, training materials and pest control tactics from an IPM perspective.

The IPM training now underway in the Philippines will continue to expand quickly as demand grows. In areas where training has occurred, there has been a dramatic reduction in the use and dependency of pesticides and chemical fertilizers. Farmers are becoming aware of the important role they play in maintaining the agro-ecosystem which they now see as interrelated with their livelihood. They are becoming accomplished decision-makers in crop management. But perhaps even more important, they are beginning to perceive how their actions can have an impact on the wider world in which they live.

César Galvan is a farmer and regional trainer in the Philippines for the United Nations Food and Agriculture Organization (FAO) Intercountry Programme in Integrated Pest Control (IPC) in Rice in Asia.

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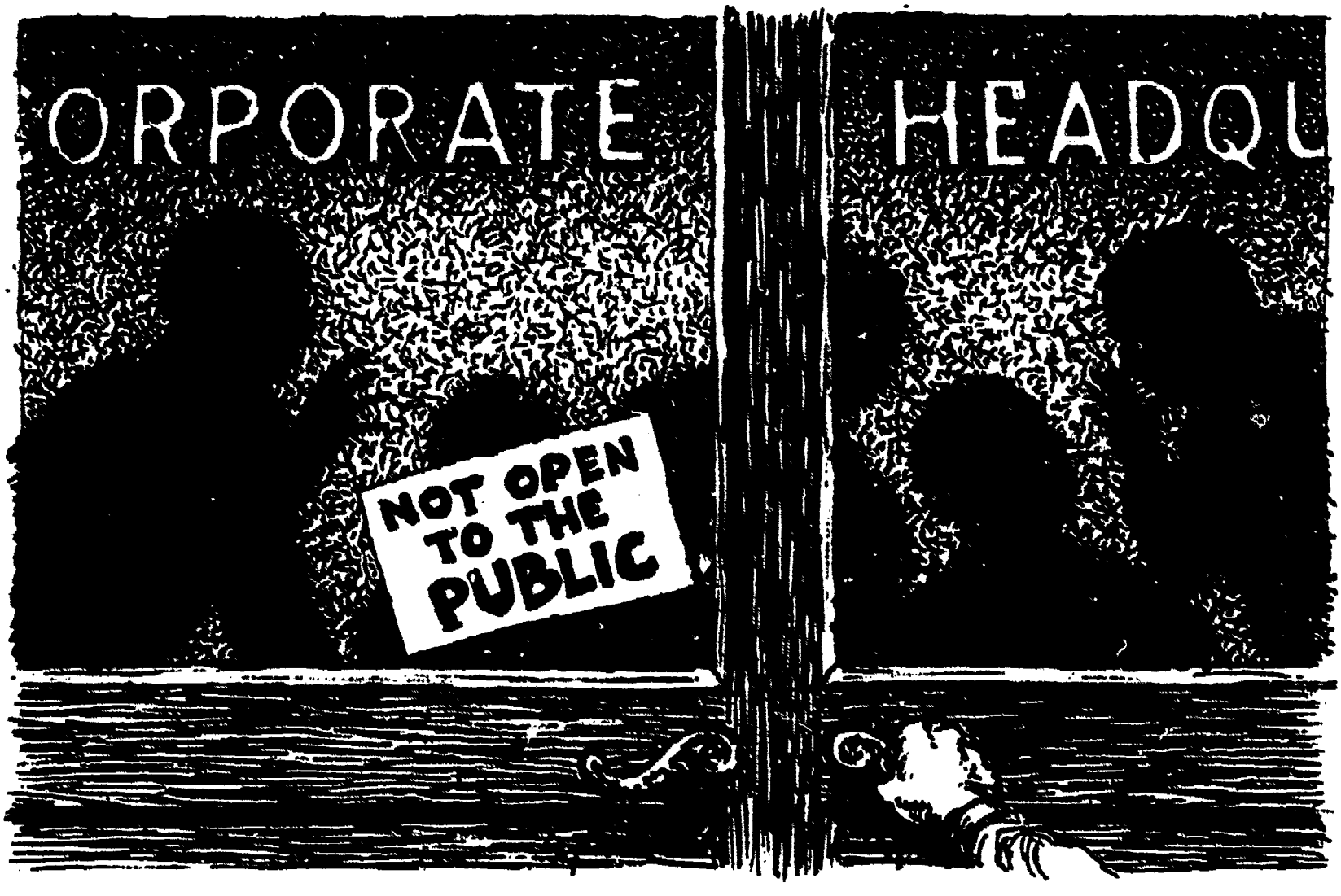


Popular Epidemiology

by Phil Brown and Dick Clapp

In 1972, three and a half year old Jimmy Anderson of Woburn, Massachusetts was diagnosed with acute lymphocytic leukemia. Over the course of Jimmy's disease, in chance meetings in stores, laundromats, and doctors' offices, his mother, Anne, was startled to hear about other cases of leukemia affecting neighbors and their children in Woburn.

She began to theorize that the seemingly large number of childhood leukemia cases in the Woburn community might be due to something in the water. She asked state authorities to test the water but was told that an individual could not initiate such an action. Not satisfied with the official response to her request, Anne Anderson and other Woburn citizens joined together to generate a chain of events that not only determined the likely cause of disease but raised valid questions about corporate responsibility for toxic wastes released into the environment.

By their own efforts, the Woburn residents confirmed the existence of a leukemia cluster in their community and demonstrated that it was traceable to industrial waste carcinogens that had leached into their drinking water supply. The actions of these families eventually led to a civil suit against corporate giants W.R. Grace and Beatrice Foods.

In July 1986, five years after Jimmy Anderson's death, a federal district court in Boston found W.R. Grace guilty of negligence for dumping large amounts of chemicals into a vacant lot along the Aberjona River in Woburn. Faced with the prospect of having a jury decide whether or not the dumping of these chemicals caused disease, Grace settled out-of-court in September 1986. Beatrice Foods, which had been acquitted in the initial trial, has since been found to have withheld information about the disposal of its own waste products. In 1989, Beatrice was back in court after families in Woburn demanded a new trial.

Woburn offers a valuable example of how lay people can uncover and communicate a situation of a community at risk to scientific experts and government officials. Woburn was not the first time that citizens have attempted to alert authorities to local hazards. But Woburn residents broke new ground by taking control of the research process to insure that the problem was understood and addressed. This kind of concerted citizen investigation of the potential causes of disease and their call for action from responsible parties is a community response which has been defined as *popular epidemiology*.

The Activist Nature of Popular Epidemiology

Traditional epidemiology is usually regarded as the study by trained specialists of factors which influence disease. Popular epidemiology, on the other hand, is the process by which laypersons may themselves gather statistics and other information, as well as direct and marshal the knowledge and resources of experts to understand the causes of disease. Popular epidemiology, however, is not merely a matter of public participation. It extends to issues of how research is conducted and whom it serves.

Popular epidemiology is by nature activist, since the lay public is doing work that should be done by experts, officials, and corporations. Popular epidemiology demands responsive action based upon its findings and seeks to place blame and responsibility on the appropriate parties as well as to obtain redress for the harm caused.

Popular epidemiology is particularly powerful when the issue is environmental pollution, drug side effects, or occupational disease. In these cases, it is often apparent that a company or organization is behaving in a way that threatens the public health, perhaps even with clear knowledge of the dangers. Environmental health activists in the community can more easily mobilize when an "adversary" can be identified.

Woburn Citizens Assume Control of Research

In May 1979, as Anne Anderson began to make connections between local leukemia rates and Woburn's water supply, builders found 184 fifty-five gallon drums in a vacant lot along the Aberjona River. Because the drums were abandoned near wells "G" and "H" which supplied drinking water to east Woburn neighborhoods, the Massachusetts Department of Environmental Quality Engineering (since renamed the Department of Environmental Protection) analyzed samples from the wells and discovered alarming concentrations of organic compounds that were known carcinogens in laboratory animals. Of particular concern were trichloroethylene (TCE) and tetrachloroethylene (PCE). While the U.S. Environmental Protection Agency's (EPA) risk level for TCE was 27 parts per billion (ppb), well G had ten times that concentration. The state ordered both wells closed.

With this development, Anne Anderson's minister, Rev. Bruce Young, began to agree with her conclusions about the water supply. He placed an advertisement in the Woburn paper, asking people who knew of childhood leukemia cases to respond. In consultation with Dr. John Truman, the physician treating Jimmy Anderson, Young prepared a questionnaire and drew a map locating a possible leukemia cluster. Several days later, Anderson and Young plotted the cases. Of the twelve cases reported, six were closely grouped geographically.

The data convinced Truman that the federal Centers for Disease Control (CDC) should become involved. Rev. Young and Anne Anderson spearheaded a local publicity campaign that succeeded in persuading the Woburn City Council to request the CDC to investigate. In January of 1980, Young, Anderson, and 20 others formed For A Cleaner Environment (FACE) to generate public concern about the leukemia cluster.

More Research...

FACE immediately called for studies by state and federal agencies to explore the links between environmental contamination and disease in Woburn and its members demanded clean up of known hazardous waste sites in the city. The general public, educators, the media, students, and independent researchers began to use FACE as a clearinghouse for information about environmental pollution and its effects on local populations.

In May 1980, in response to FACE's efforts, the CDC and the National Institute for Occupational Safety and Health (NIOSH) sent a team affiliated with the Massachusetts Department of Public Health (DPH) to study the Woburn case. Their report, released in January of 1981 in the week following Jimmy Anderson's death, stated that the twelve cases of childhood leukemia in Woburn were well over twice the expected rate. Moreover, the incidence of kidney cancer was elevated. Despite these results, the data were considered inconclusive, primarily because the study made no attempt to estimate how much water the cancer patients had drunk from wells G and H.

FACE remained undaunted. Despite the criticisms, the study clearly illustrated the need for more research. FACE's next step was to enlist the help of the Harvard School of Public Health in a larger survey, involving telephone interviews with over 5,000 households in Woburn. FACE helped design the study and recruited most of the 300 volunteers who conducted the interviews.

The findings, released in 1984, found that children with leukemia received an average of 21.2% of their yearly water supply from the contaminated wells, compared to 9.5% for children without leukemia. Similar findings for adverse pregnancy outcomes as well as other childhood disorders were also reported.

The report was greeted cautiously, and was criticized in many circles. The possible bias of volunteer citizen interviewers was mentioned, as well as the lack of attention to other possible sources of contamination in east Woburn. While these criticisms demonstrated some legitimate concerns, they were also clear examples of elitism and opposition to community involvement in scientific work.

Today, FACE continues to focus attention on the need to understand the extent of environmental contamination and its connection to health problems, both in Woburn and elsewhere. FACE has received support from foundation grants as well as private donations and its members continue to testify at government hearings and to sit on advisory committees.

In the community, FACE has organized environmental awareness months as well as household collection days for hazardous waste. It has sponsored high school student project awards and convened numerous public meetings and symposia which focus on environmental health issues. FACE continues to main-

tain an active membership and has shared its organizing experience with other community groups throughout Massachusetts and across the U.S. FACE has enlisted the help of several scientific advisors and remains committed to advocating for the public interest.

Popular Epidemiology and Social Movements

What implications do popular epidemiology and groups like FACE have for the development of broader social campaigns? To begin with, participation in a popular epidemiological project such as the Woburn effort leads many normally passive community members to acquire a deeper understanding of environmental and political issues on both a local and a national level. Many veterans of groups like FACE have become accomplished political activists and Woburn's activism has spurred other Massachusetts communities to demand fuller investigation and disclosure of environmental risks in their own areas.

In addition, popular epidemiology can shape the activities of public agencies that initially fail to do their work. The Woburn case provided the major impetus for establishing the Massachusetts statewide cancer registry. Woburn also played a significant role in the passage of a Massachusetts law to monitor toxic wastes in water supplies, the state's community "right-to-know" provisions, and several ongoing research studies.

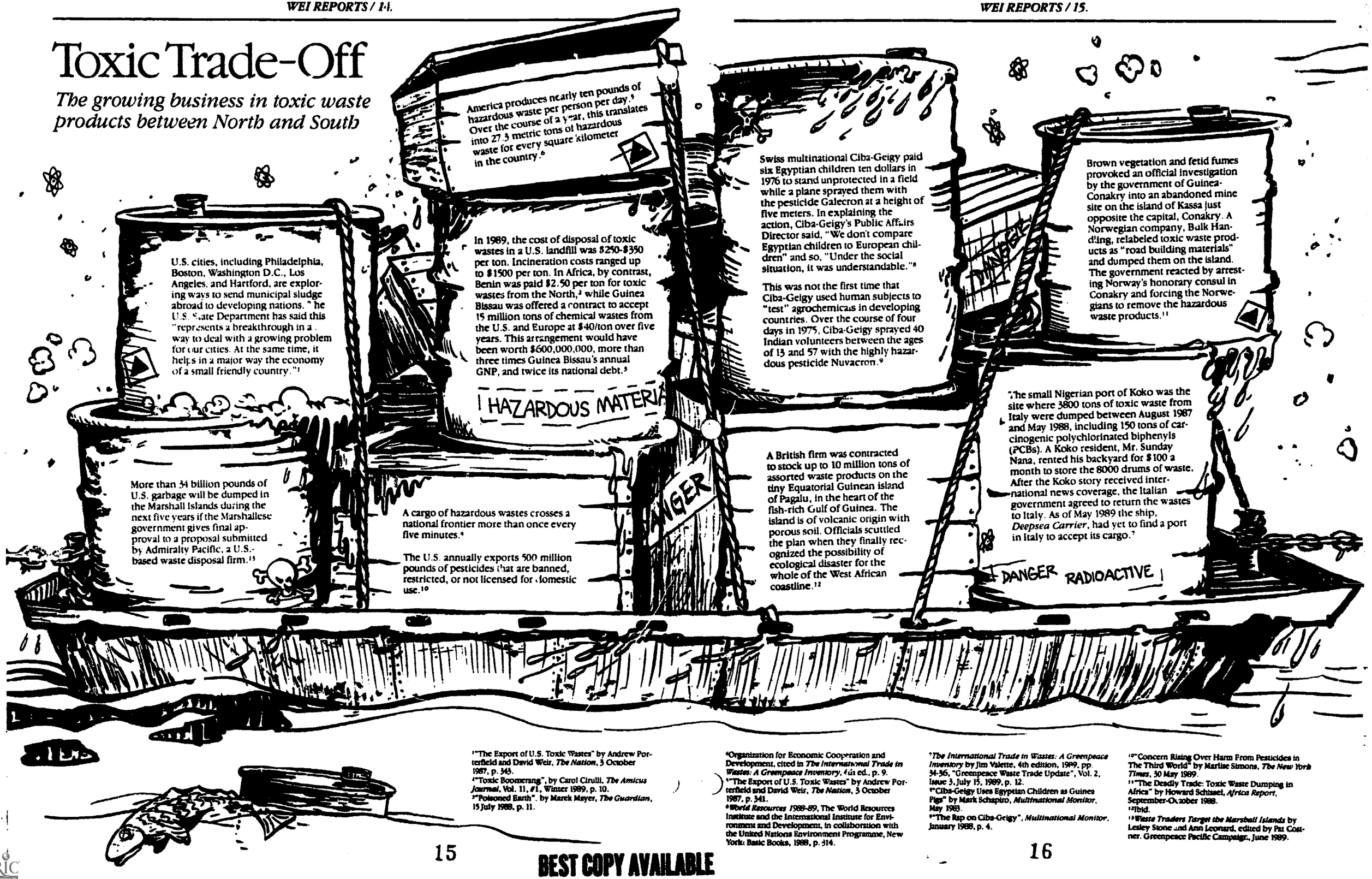
Perhaps most importantly, popular epidemiology has brought local communities into the decision-making process about environmental health hazards. Whereas risk has been previously identified and controlled by scientific research and government regulation, the environmental activism of the past decade has now established community groups as a significant third force in environmental hazard action.

Dr. Phil Brown is a medical sociologist who teaches at Brown University in Providence, R.I. He is co-author with Dr. Edwin Mikkelson of a book entitled "No Safe Place: Leukemia, Toxics and Community Response", which will be published later in 1990, and which describes the community response to toxic hazards in Woburn and other communities in the U.S.

Dr. Richard Clapp is an epidemiologist who directs the JSI Center for Environmental Health Studies in Boston, MA. He was formerly director of the Massachusetts Cancer Registry, which was established because of the leukemia cluster in Woburn and has been used to track cancer patterns in communities throughout the state since 1982.

Toxic Trade-Off

The growing business in toxic waste products between North and South



U.S. cities, including Philadelphia, Boston, Washington D.C., Los Angeles, and Hartford, are exploring ways to send municipal sludge abroad to developing nations. "The U.S. State Department has said this "represents a breakthrough in a way to deal with a growing problem for our cities. At the same time, it helps in a major way the economy of a small friendly country."[1]

America produces nearly ten pounds of hazardous waste per person per day.[5] Over the course of a year, this translates into 27.3 metric tons of hazardous waste for every square kilometer in the country.[6]

In 1989, the cost of disposal of toxic wastes in a U.S. landfill was $250-$350 per ton. Incineration costs ranged up to $1500 per ton. In Africa, by contrast, Benin was paid $2.50 per ton for toxic wastes from the North,[2] while Guinea Bissau was offered a contract to accept 15 million tons of chemical wastes from the U.S. and Europe at $40/ton over five years. This arrangement would have been worth $600,000,000, more than three times Guinea Bissau's annual GNP, and twice its national debt.[3]

Swiss multinational Ciba-Geigy paid six Egyptian children ten dollars in 1976 to stand unprotected in a field while a plane sprayed them with the pesticide Galecron at a height of five meters. In explaining the action, Ciba-Geigy's Public Affairs Director said, "We don't compare Egyptian children to European children" and so, "Under the social situation, it was understandable."[8]

This was not the first time that Ciba-Geigy used human subjects to "test" agrochemicals in developing countries. Over the course of four days in 1975, Ciba-Geigy sprayed 40 Indian volunteers between the ages of 13 and 57 with the highly hazardous pesticide Nuvacron.[9]

Brown vegetation and fetid fumes provoked an official investigation by the government of Guinea-Conakry into an abandoned mine site on the island of Kassa just opposite the capital, Conakry. A Norwegian company, Bulk Handling, relabeled toxic waste products as "road building materials" and dumped them on the island. The government reacted by arresting Norway's honorary consul in Conakry and forcing the Norwegians to remove the hazardous waste products.[11]

The small Nigerian port of Koko was the site where 3800 tons of toxic waste from Italy were dumped between August 1987 and May 1988, including 150 tons of carcinogenic polychlorinated biphenyls (PCBs). A Koko resident, Mr. Sunday Nana, rented his backyard for $100 a month to store the 8000 drums of waste. After the Koko story received international news coverage, the Italian government agreed to return the wastes to Italy. As of May 1989 the ship, *Deepsea Carrier*, had yet to find a port in Italy to accept its cargo.[7]

More than 34 billion pounds of U.S. garbage will be dumped in the Marshall Islands during the next five years if the Marshallese government gives final approval to a proposal submitted by Admiralty Pacific, a U.S.-based waste disposal firm.[13]

A cargo of hazardous wastes crosses a national frontier more than once every five minutes.[4]

The U.S. annually exports 500 million pounds of pesticides that are banned, restricted, or not licensed for domestic use.[10]

A British firm was contracted to stock up to 10 million tons of assorted waste products on the tiny Equatorial Guinean island of Pagalu, in the heart of the fish-rich Gulf of Guinea. The island is of volcanic origin with porous soil. Officials scuttled the plan when they finally recognized the possibility of ecological disaster for the whole of the West African coastline.[12]

[1] "The Export of U.S. Toxic Wastes" by Andrew Porterfield and David Weir, *The Nation*, 3 October 1987, p. 343.
[2] "Toxic Boomerang", by Carol Cirulli, *The Amicus Journal*, Vol. 11, #1, Winter 1989, p. 10.
[3] "Poisoned Earth", by Marek Mayer, *The Guardian*, 15 July 1988, p. 11.
[4] Organization for Economic Cooperation and Development, cited in *The International Trade in Wastes: A Greenpeace Inventory*, 4th ed., p. 9.
[5] "The Export of U.S. Toxic Wastes" by Andrew Porterfield and David Weir, *The Nation*, 3 October 1987, p. 341.
[6] *World Resources 1988-89*, The World Resources Institute and the International Institute for Environment and Development, in collaboration with the United Nations Environment Programme, New York: Basic Books, 1988, p. 314.
[7] *The International Trade in Wastes: A Greenpeace Inventory* by Jim Valette, 4th edition, 1989, pp. 34-36, "Greenpeace Waste Trade Update", Vol. 2, Issue 3, July 15, 1989, p. 12.
[8] "Ciba-Geigy Uses Egyptian Children as Guinea Pigs" by Mark Schapiro, *Multinational Monitor*, May 1988.
[9] "The Rap on Ciba-Geigy", *Multinational Monitor*, January 1988, p. 4.
[10] "Concern Rising Over Harm From Pesticides in The Third World" by Marlise Simons, *The New York Times*, 30 May 1989.
[11] "The Deadly Trade: Toxic Waste Dumping in Africa" by Howard Schissel, *Africa Report*, September-October 1988.
[12] Ibid.
[13] *Waste Traders Target the Marshall Islands* by Lesley Stone and Ann Leonard, edited by Pat Conner. Greenpeace Pacific Campaign, June 1989.

Less is More

by Miguel Altieri and
Andres Yurjevic

Agroecology and peasant farming in Latin America

Jorge and Maria Rojas live with their family in Las Palmas, a rural peasant community on the coastal range of central Chile. They have four children. The older two have migrated to Santiago in search of work. The younger ones, Luis and Rosa, attend school and help on the family farm in their free time. In many ways the Rojas are typical of the eight million peasant farming families in Latin America. Their plot of land is about two hectares, and located in a hilly region. They are completely dependent on rainfall, and rely solely on local resources and techniques such as manure, crop rotation, and intercropping to maintain soil fertility and to control pests.

The Rojas grow potatoes, maize and beans for subsistence. Sometimes, they

can sell a small surplus in the local market, but the income from food crops is not enough to support the family. To make ends meet, Jorge takes occasional laboring jobs off the farm and the family has planted a piece of their land with tobacco, under contract to a nearby company which exports the harvest.

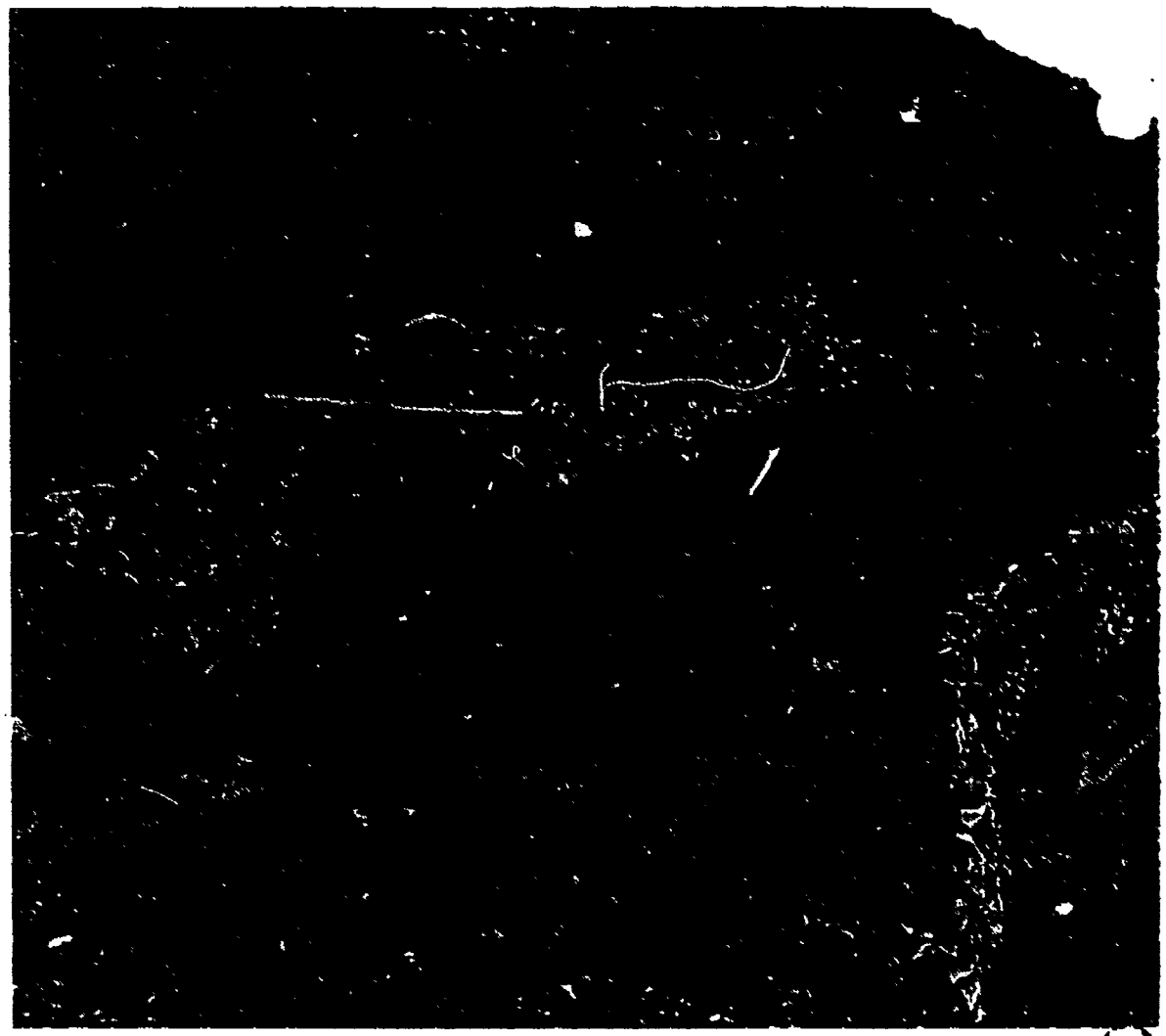
Because the Rojas need the cash that it generates, tobacco controls the dynamics of their farming system. Since tobacco cultivation demands a lot more time and labor than subsistence farming, the food crops do not receive the attention they need. On top of this, tobacco is ecologically degrading to the Rojas land because it is grown on the same soil year after year and must be managed with costly chemicals. To survive as farmers, the Rojas have become trapped in a cycle of production that is unsuited both to their economic situation and to the ecological conditions of their land.

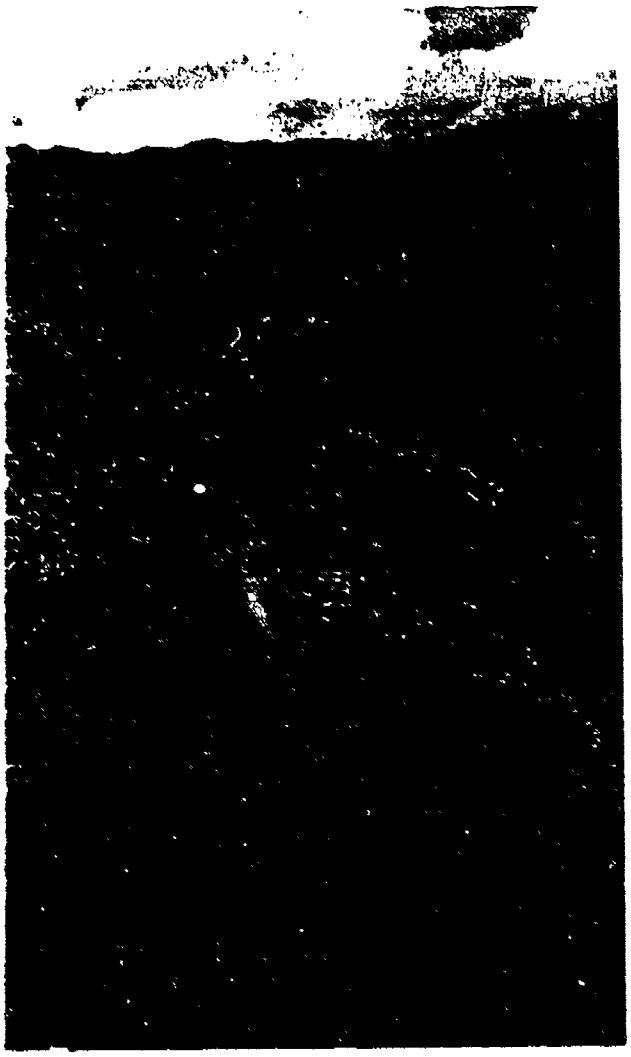
For *campesinos* like the Rojas to develop their farms so that they can support their families adequately is an extremely complex matter. The problems they face require not merely technical solutions, but also adjustments in prevailing economic and socio-political patterns as well as patterns of land and water use. Throughout Latin America the major economic issue for peasant farmers is access to sufficient land. In the current socio-political climates in the region, however, peasants have little bargaining power, nor are they organized enough, to challenge the hegemony of the state and of powerful land owners. As long as they are only concerned with their struggle to survive, peasant farmers will have a difficult time organizing for the control over their lives needed to bring about changes in the status quo.

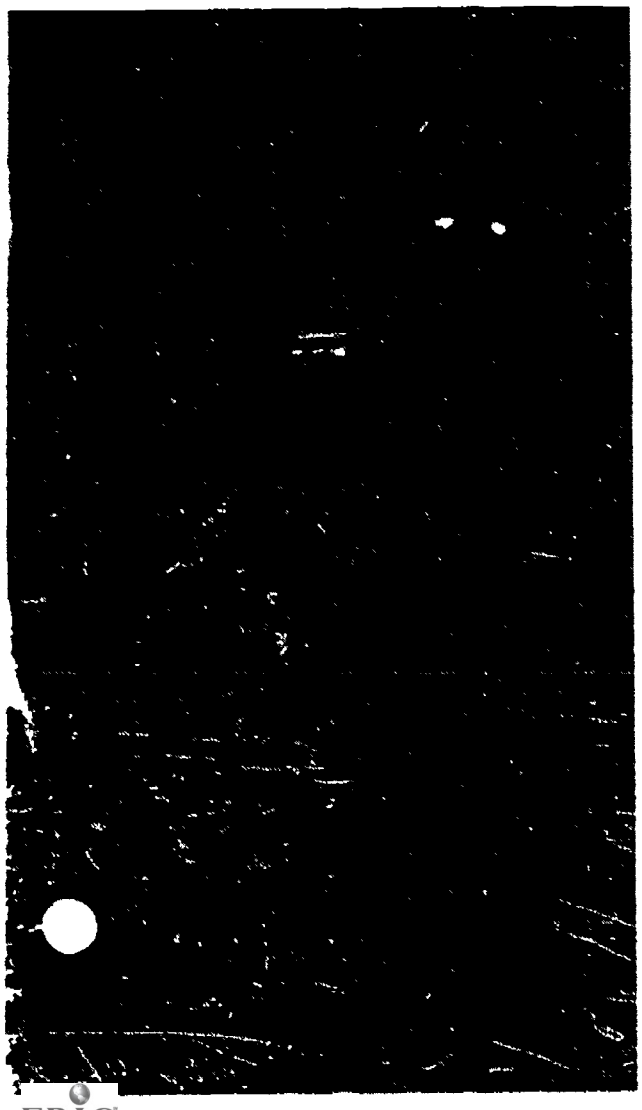
The ultimate goal of small farm development is to enable peasant farmers to improve their lives. The immediate tasks, then, are to assist these farmers to increase their productivity in a manner that improves their economic situation and their land's viability, become more self-sufficient, and gain the self-confidence and skills they need to become agents of their own change.

Although improving the productivity of small farms in marginal lands such as that of Jorge Rojas was supposedly one of the principal objectives of the Green Revolution, this goal was seldom reached. In the past three decades of rural development efforts in Latin America, technological innovations that were introduced have been largely inappropriate for *campesino* farmers and have frequently created more problems than solutions.

In the wake of the Green Revolution in Latin America which entailed the introduction of improved seeds and associated technologies, the significance







of peasant agriculture in regional markets has been markedly reduced and, today, less than one-third of peasant income is derived from farming. Moreover, peasant farmers have lost confidence in their traditional agricultural knowledge and suffer first and most dramatically from the consequences of the indiscriminate use of agrochemicals, many of which have in fact been banned in the industrial world for safety reasons. The fact that most Latin American countries have become net importers of the chemicals and agricultural machinery required by Green Revolution strategies has added to the difficulties of their balance of payment and has increased overall dependency on external technologies. Finally, national planners, regardless of their views of how development should proceed, cannot ignore the fact that despite the institutional, technological and structural biases acting against peasant farmers in Latin America, these peasants are still the largest producers of locally-consumed staples: maize, beans, and potatoes.

In contrast to the often misguided technological innovations of so many development efforts, a new approach to the crucial problem of restoring peasant agriculture and increasing productivity has been gaining ground as a more workable alternative. This approach, built on concepts of agroecology, is having a growing impact on program efforts designed to increase peasant production throughout Latin America.

Increasing Peasant Production: A New Approach

Agroecology is a scientific discipline that studies agriculture from an ecological perspective, and utilizes ecological principles to develop self-sufficient and sustainable agricultural systems. It is based on principles which respond to the constrained economic and socio-political circumstances of peasant farmers and which use development technology in a way that is appropriate to the marginal agricultural conditions of their land.

Agroecological techniques are culturally compatible with peasant farming because they do not attempt to radically modify or transform the peasant ecosystem. Rather these techniques are built on traditional farming knowledge, combining it with appropriate elements of modern agricultural science. Despite the poverty of these farmers, agroecological approaches are economically viable since they minimize costs of production by encouraging the use of locally available resources. And also important, since they require a high degree of popular participation and cooperation, these approaches are socially activating.

When considering the situation of the Rojas family, the advantages of an agroecological approach become more apparent. The Rojas fortunes have changed dramatically since their contact with the Centro de Educacion y Tecnologia (CET), a Chilean nongovernmental organization (NGO) which teaches and practices agroecology and is active in local communities throughout the country. CET maintains demonstration farms, or *centrales*, which serve as resource centers for peasant farmers. The *central* is essentially a school for agroecological techniques, providing a living example of how small farms can be viable using resources which are locally at hand. The thrust of CET's program is to enhance social initiative and increase agricultural productivity without depleting the community's resource base (i.e. soil, water, natural vegetation, etc) and, therefore, contributing to a downward spiral into greater poverty. In addition to economic and environmental benefits, the program engenders a sense of self-esteem and self-confidence that allows farmers to make decisions and take action by valuing traditional peasant practices and knowledge such as multiple cropping, mulching and composting.

Each *central* offers "Technological Pedagogical Units" (TPUs), which are modules that teach an agroecological option that can be used on a peasant farm. Among the many TPUs which CET has developed are the following: Intensive Vegetable Home Gardens, Organic Crop Rotation Scheme, Mobile Chicken Houses, Organic Animal Husbandry, Solar Kitchens and Heaters, Environmental Hygiene, Forest and Fruit Tree Nurseries, and Home Construction With Wood and Mud. In addition to the technical components, each TPU addresses social and pedagogical aspects so that peasants understand the roots of their situation, and the relevance of the technology to larger issues in their lives and communities. They begin to understand that the process of learning can transform them into controllers of their lives.

In the Rojas' case, a local organizer who had been trained at CET explained to Jorge the potential benefits of adopting agroecological techniques on his farm. Jorge became interested, and CET subsidized a week-long stay for his son Luis and himself at the CET *central* at Colina near Santiago. Jorge and Luis, together with other peasant farmers, studied and practiced many of CET's TPU modules at Colina. Normally peasants become exposed to a TPU by having group discussions about their own production constraints and about

Agroecology and the Role of NGOS

The decline of peasant sector agriculture in Latin America today is largely the result of inappropriate development strategies that have equated national interests with an export strategy favoring large farmers, cattle ranchers, and logging and mining companies at the expense of peasant producers. National agricultural policy, therefore, has been geared towards raising plantation crops such as cotton, coffee and tobacco for export. The research work undertaken by most official institutions, including universities, Ministries of Agriculture and national or international research centers, has been heavily influenced by American agro-scientific research and its bias towards the technological farming of export crops. When these institutions have directed any attention to peasant farmers, they have exhibited clear deficiencies in their capacity to generate technologies that respond to the realities of peasant agriculture.

In recent years, however, a significant number of NGOs concerned with the development of peasant agriculture have been strongly influenced by an agroecological approach, and they have conducted their agricultural research and extension work in accordance with its principles. A key component of these NGO programs is ensuring that farming systems have an empowering effect on both individual families and the total community. To achieve this, the technological process is complemented by programs of popular education that tend to preserve and strengthen local inventiveness and indigenous decision-making while supporting peasants in the process of technological adaptation, linkage to markets, and social organization. By enhancing peasants' awareness of their possibilities and limitations, the programs help communities become agents of their own change.

Despite the compatibility of agroecology with many NGO activities, there is a realization that to further advance agroecology's development and application, a broader mobilization of human, scientific, and institutional resources is needed. Networking exchanges among NGOs, local universities, and research centers have been valuable, in part, because they help NGOs realize that the challenges of rehabilitating peasant agriculture are immense and beyond the reach of each institution separately.

Convinced of the need for a new institutional arrangement that can promote the role of agroecology in rural development, eight South American NGOs joined together in Santiago, Chile in January of 1989 to create the Consorcio Latino Americano sobre Agroecologia y Desarrollo (CLADES), the Latin American Consortium on Agroecology and Development. NGOs from Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, and Peru, all with at least five years of program experience in agroecology, formed the charter membership. CLADES serves as an institutional axis to coordinate agroecological research, training and information exchanges between member NGOs, extending the consortium's expertise within national and regional areas. Its overall goal is to place the *campesinos* and their land at the center of the region's agricultural development effort. This focus is seen as a first major step towards combatting rural poverty, preserving natural resources and securing food self-sufficiency in Latin America.

how the particular technology offered in the TPU could help them overcome such constraints. Discussions are followed by practical training where peasants acquire hands-on experience in the how-to of each technology. Each TPU is accompanied by a written and illustrated manual which describes all aspects of the technology in detail. Once back home in Las Palmas, Jorge was able to obtain credit through a CET revolving fund, which did not offer him capital, but provided him with credit in kind—better crop seeds, fruit and forest tree seedlings as well as ten chickens and two cows, all for use on his two hectares.

Today, three years later, the Rojas are self-sufficient in vegetables, cereals, legumes and proteins from livestock, with surplus production marketed in nearby towns. The Rojas also repay CET's credit in kind, for CET to continue distributing seeds, trees and animals to other peasants. Their production has become sustainable because of the conservation techniques and organic technologies that Jorge and Luis learned about from CET. And the Rojas have kicked the tobacco habit. In addition, Jorge has become an informal advisor to many of his neighbors who are eager to duplicate his success. Many of them have attended sessions at CET *centrales*, or have been visited by CET promoters who discuss technical problems with Las Palmas farmers and evaluate the performance and impact of their productive systems.

Evidence throughout rural communities in Latin America indicates that agroecological approaches provide peasants like the Rojas with a production style that enables them to:

- develop an attitude toward the technological process that allows farmers to discriminate, select and adapt new technologies, and also to validate those values and practices that originate within their own social group.
- produce sufficient food and cash without risking indebtedness or depletion of their land and environment.
- develop their organizational skills around areas of production which can lead to strong community-based actions that demand better access for peasants to land, water and other natural resources as well as to equitable credit, market inputs and appropriate technologies.

If Latin America is going to improve food self-sufficiency in the 1990s, agroecology is an agricultural approach that needs to be taken increasingly seriously.

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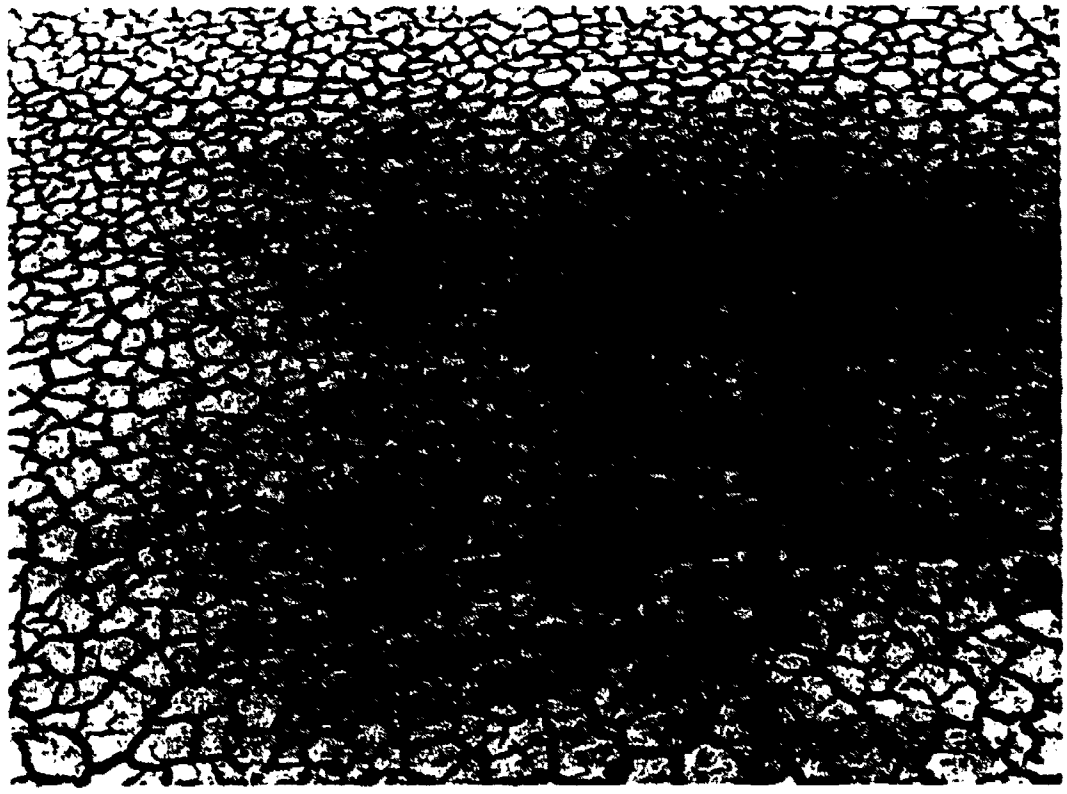
Reports On...



Natural Resources and Economic Opportunity

Lessons from the Sahelian Experience

by Asif M. Shaikh and
Kjell A. Christophersen

Rural economic production in the West African Sahel depends upon the environment. Ninety percent of the population derives all or part of its livelihood from agriculture, herding, fishing, or other forms of resource management. Traditional production systems have been under increasing stress for two generations, with rapid and visible deterioration of the resource base since the early 1970s. The consequences have forced rural populations Sahelian governments, and the international community to reexamine the options for sustainable economic development in the region.

Experience in the Sahel with farmer-based initiatives has yielded a number of lessons about practices which have enduring impacts and the conditions under which they occur. There are a variety of innovative interventions and policy initiatives that can achieve sustainable increases in agriculture and rural income. These activities help farmers to help themselves in ways that do not deplete the resource base nor compromise the farmers' ability to provide for their families. They provide models for policy makers and development planners, and for host country and donor investments.

Establishing Secure Land Tenure Rights

When farmers do not have confidence that they will have the right to remain on the land they work, their incentive to improve the land towards sustainability is vastly diminished, if not entirely eliminated. Successful initiatives have either negotiated specific exemptions to existing resource tenure legislation or have succeeded in spite of that legislation. Clearer and more secure tenure systems are vitally needed.

Environmental crisis has created the need to invest in private land to protect it from degradation. Insecurity of tenure has reduced the incentive to make such investments. Lack of land tenure is a constraint to replication of successful initiatives in every country in the Sahel. Failure to address legislative obstacles to private initiative can raise the cost and lower the success rate of all future natural resource management efforts in the region.

Defining Success in Human Terms

It is the human dimension, rather than the technological one, which takes time. For initiatives to mature, a long time frame is necessary to bring about genuine participation. A concerted effort should be undertaken to promote host country and multi-donor agreement on strategy objectives over a twenty to thirty year time frame. There is widespread evidence of misjudgment by donors and host governments who have abandoned valuable efforts because they did not achieve short term technical results.

Long-term commitment, the willingness to learn from mistakes and try new approaches, and the flexibility to adapt to new opportunities as they arise are all important contributors to success. The time needed to achieve visible impacts appears to increase with the novelty of the techniques, competition for resources, and inexperience of technical assistance. Time requirements have

been shorter in the presence of market incentives and supportive values, policies, and social structure.

Initiatives have had the greatest impact when they have broadened the definition of what constitutes a natural resources management intervention that is, when approaches have resolved the problems of the populations or communities involved rather than of the environment per se. Ultimately, success should be defined in human, rather than biophysical terms.

Spreading Existing Technologies

There is a sufficient range of technically proven and economically attractive natural resource interventions to halt the decline of rural production systems in the Sahel. Existing technologies and strategies have had substantial and enduring impacts on the capacity of farms and villages to produce food, forage, wood, and other products. Technology is not now the limiting factor.

The greater development challenge is to bring about widespread adoption of the appropriate technologies which are already available. A high priority at all funding levels should be the *deployment* of existing technologies which have positive and financially attractive impacts at the farm and/or village levels and which help to meet criteria necessary for a sustainable system.

Providing Powerful Role Models

Innovators are set apart by their prior exposure to new and different cultural influences, often combined with some previous access to cash income. Initial ventures were often treated with skepticism and sometimes ridiculed by other farmers, but the success of innovators has subsequently been copied. Successful resource management initiatives improve the climate for subsequent efforts.

An effective approach has been that of taking ordinary farmers from a project area to visit the farmers who have implemented new techniques, rather than utilizing outside experts to educate farmers. This approach, used in concert with village councils, women's groups, national publicity campaigns, and the mass media has contributed to achieving widespread participation at relatively low cost.

Increasing Socio-Economic Incentives

In addition to new policy directions concerning land tenure, socioeconomic incentives can play an important role in influencing farmer behavior. The policy goal is to create an atmosphere which either provides, or ceases to inhibit, rational incentives for smallholder participation and investment in natural resource management.

For example, the empowerment of village cooperatives to manage local resources, and tax exemptions for commercial enterprises, have created income generation potential and mobilized village participation. Additional tax incentives should be structured to reflect the long term economic costs of replacing dwindling wood supplies. The creation of revolving funds managed at local and village levels can provide credit to small farmers for improved management. Direct payments of cash, market incentives, or other inducements should be contingent on implementation of a package of natural resource management activities. Food for work and direct employment can also play a role in boosting sustainable activities.

Assuring financial benefits to partic-

ipants has proven to be a successful approach to eliciting smallholder participation. "Buying" participation may, however, foster, sustain and reinforce the impression that better resource management is in "someone else's" interest and must therefore be paid for. One successful approach effectively combats this attitude by limiting its subsidy to the start-up phase, after which the village initiative responds to market incentives

More than Technical Interventions...

The right socioeconomic incentives have allowed marginal techniques to succeed, and their absence has caused excellent technical approaches to fail. No single technical approach is likely to be sufficient to stabilize the Sahelian environment. Fundamental is the idea that success cannot be attributed to technical measures alone. Incentives—social, economic, policy—play an equally important role. Offering and demonstrating a range of viable options increases the "surface area" through which technology transfer can occur.

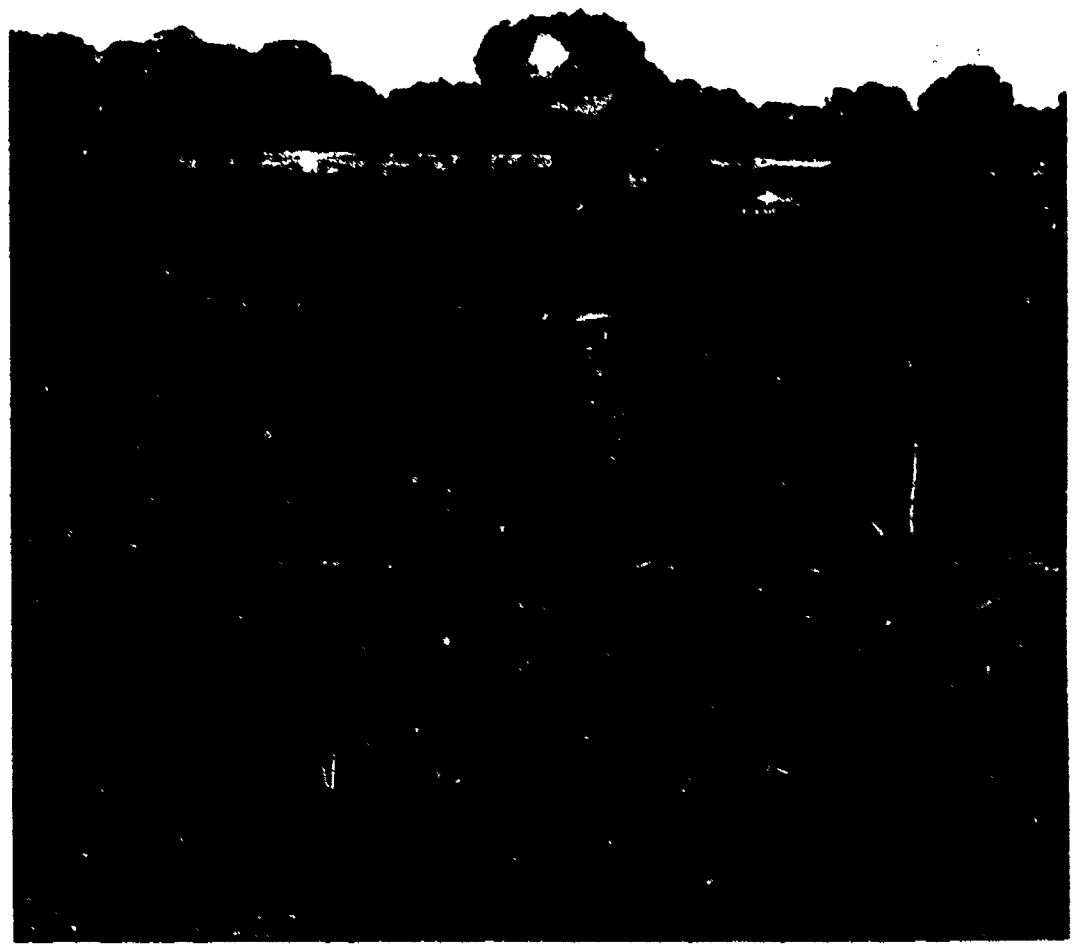
Typically, the large scale successes involved many things happening at once: technical interventions, new socioeconomic incentives, policy change and a changing economic and natural context. In addition, dramatic examples of private initiative have proven that there are strategies for intensified land management which rely primarily on labor input

Opportunities for Income Generation

Relieving local economic pressure and creating new income generation opportunities, though slow and arduous, has had greater success than the attempt to simply protect resources. When local populations must feed their families, they have little choice but to exploit what is around them

It is extremely difficult for governments to prevent encroachment on protected areas unless the surrounding populations are given a positive stake in their preservation. Because local economic and environmental pressures necessarily vary from one location to another, alleviating them may require relatively long lead times and patient work at the micro level. Because of its long term nature, environmental education can contribute to increasing the understanding of the importance of environmental protection and of the potential solutions to resource competition conflicts

Creating opportunities for income generation from natural resource management has been as much a successful intervention as the introduction of specific technologies



Process—a Key Factor

Projects which sometimes offer little tangible product, but in which a process of mutual accommodation and adaptation of techniques and extension methods between implementing agencies and participants is permitted to occur over time, often seem to be the most promising. Simply put, "doing something right" is as important as "doing the right thing"

Paternalistic extension methods which conflict with local knowledge and economic incentive systems are less successful than interactive approaches to extension.

Values play a critical role in sustained success and are crucial to replicability. An intervention which is an indisputable success in one culture may have to be significantly altered before it will be adopted by another cultural group

Arresting the decline of the rural production base in the Sahel will take concerted action over the next generation, built on a long term contract between Sahelian populations, national governments and the international donor community. Each party to the contract must share the costs of resource management. For the public sector, it is far cheaper, even in budgetary terms, to share the cost of success than to remedy the effects of failure.

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BOOKS

Book Reviews

Women and Environment in the Third World: Alliance for the Future

by Irene Dankelman and Joan Davidson, Earthscan Publications Ltd., London, U.K. 1988 (US $11.90)

Reviewed by Dianne Rocheleau

Irene Dankelman and Joan Davidson have produced a timely and accessible summary of women's concerns with environment and development issues in Africa, Asia and Latin America. They state in their preface that "Northern women writing about life in the South can do little more than try to give some voice to the voiceless". I would contend that they have done both *less* and *better* than that. They have woven a space for and convened a discussion of some already very powerful and convincing voices. Statements by Victoria Chitepo, Vandana Shiva, Maria Jose Guazzelli, and Shimwaayi Muntemba all convey a crucial message to environmental and women's movements in the North: (1) "once you have global destruction the only countervailing force can be a (decentralized) global movement" (Shiva, p. 119); (2) "women all over the world are (already) taking action against the destruction of natural resources on which their lives depend" (Chitepo, preface); (3) "women's groups can pioneer and sustain vocal, effective, environmental movements at a national scale" (Guazzelli, p. 120); and (4) "the approach to working with women's organizations in the developing world should be one of dealing with *those who know*, but who (often) lack power and financial resources" (Muntemba, p. 122).

Through a mix of scholarly and journalistic reports, case studies and interviews, the authors present a compelling picture of "women as the daily managers of the living environment". They also provide an effective answer to the prevailing preconceptions about women's apparent complicity in environmental destruction by noting that, "Third World women often have no choice but to exploit natural resources in order to survive, even though they may have the knowledge to promote sustainability".

Part I documents women's actual experience and problems, especially the effect of environmental degradation on women's daily lives and unfolding futures. Part II reviews the roles of women in environmental conservation and the activities of international development and environmental agencies. In the final chapter, the authors present an overview and proposed strategy for action.

Dankelman and Davidson set out to examine the relationship of rural women to their environments, to show how women deal with environmental crisis, and to look at the response of international and national agencies to the convergence of women's interests, environmental conservation and economic development. While they do an excellent job of all three, their task is limited by a focus on women rather than on the gender division of interests and activities in rural environments and livelihood systems. Given the importance of both complementarity and conflict between women's and men's rights and responsibilities, there is much to be gained from an explicit treatment of "traditional", transitional and emerging gender divisions of labor, as well as knowledge, control and responsibility in rural communities. While there is some discussion of the new division of labor and men's migration to cities and mines, there is little explicit treatment of how men might contribute more to sustainable development, or how women and men can resolve conflict in rural landscapes.

A Perspective of Feminist Reform...

The book documents the existence of a longstanding convergence of the interests of rural women, environmental conservation and sustainable development, as well as the emerging context for global action by a coalition of groups working in all three areas. At the risk of over-simplifying a heroic attempt at a pluralistic survey of problems and prospective solutions, I would describe the overall perspective as one of feminist reform of sustainable development. As such this book is a useful tool for educating the environmental and development establishments in both the North and South, and at the same time providing a conceptual framework and networking information for those already addressing women's interests in environment and development.

The authors remind us of a critical moment when women's environmental concerns surfaced in the Forward Looking Strategies for the Advancement of Women, and eventually entered into a resolution adopted by the 40th Session of the UN General Assembly in December of 1985. Since then international environmental groups and the UN Environmental Program have repeatedly and insistently called for sustainable development. However, the subsequent programs from governmental and intergovernmental agencies alike have sounded increasingly like another *job* for women, as opposed to efforts to save and support them. Those of us in positions of influence are admonished to fulfill a special duty to listen and represent those at the sharp end of the environmental crisis, yet there is little talk of men's responsibility to take heed of any advice we may give. The authors note that development aid to women in national

Book Reviews

circles is still largely an afterthought, and they place most of their hopes on the NGO community as more appreciative of women's knowledge, experience and positive contributions to environmental conservation and rural livelihoods.

In their own forward looking strategy Dankelman and Davidson note that "effective development requires the full integration of women in the development process as both agents and beneficiaries" and that "development agencies should take full cognizance of women as a development *resource*". I would argue that they already have, and that that has become part of the problem. Women are now in danger of becoming key actors and essential resources, in a global drama whose script has not necessarily been written to feature their interests in the final outcome. In other words, women are being utilized in "development" strategies that ultimately do nothing to improve their position.

The three main prescriptions offered by the authors are hard to beat. They propose to increase women's capacity by integrating women's participation and a variety of environment and development issues with a community-based approach to sustainable development. They further emphasize the need to get on and replicate successful pilot projects, rather than maintaining them as proof of potential improvements to the status quo. With respect to training, the authors argue for greater focus on South-South training rather than North-South technology transfer, a point which has echoed through the conference halls of NGO meetings for the last decade.

Awareness and Advocacy

The book ends with a strong plea for continued work on awareness and advocacy. As a means to that end the authors propose that some organizations become national and regional focal points, to argue *against* misguided projects and *for* sustainable development. These designated organizations could be alliances of environmental and welfare NGOs, research and educational institutions and women's groups.

In addition to their own analyses and those of their contributors, Dankelman and Davidson have distilled some of the key points as well as the spirit of four major international gatherings on women, environment and/or development between 1985 and 1987. These include the Global Meeting on Environment and Development for NGOs convened by the Environment Liaison Center (ELC) in February of 1985; the conference on the UN Decade for Women held in Nairobi in July of 1985; the related environmental workshops sponsored by the ELC and Kenyan NGOs at the concurrent NGO Forum in Nairobi; and the caucus on Women, Environment and Sustainable Development at the international conference on Conservation and Development—Implementing the World Conservation Strategy, convened by IUCN (International Union for the Conservancy of Nature) in Ottawa in 1986. Having personally participated in two of these meetings, and followed the others from afar, it was gratifying to see the results so quickly and ably synthesized, supplemented and presented in readable form between the covers of one book. This alone would be reason enough to buy, read and share the book with friends, colleagues and students.

This is not to say that this volume tells the whole story, indeed the many stories, of what we have all learned over the past five years. Perhaps the greatest omission is the story of DAWN, Development Alternatives for Woman of a New Era, a group formed in response to many of the same problems described in the book, but viewed from the perspective of Third World women working as development activists, researchers and planners. While some key members of DAWN are featured in this text, there are some notable exceptions, such as Peggy Antrobus, whose work complements the point of view and content presented in Women and Environment in the Third World. The recent emergence of ecofeminism and feminist critiques of science, including "scientific ecology", have also not been included.

Several major works in related fields have appeared simultaneously and constitute a force to be reckoned with by the environment and development establishments at a national and international level. Vandana Shiva's recent book *Staying Alive: Women, Ecology and Development*, 1988 (reviewed in this issue of REPORTS), two books recently published or in press by Bina Agarwal (see Resource Page), a number of articles by Peggy Antrobus, as well as several DAWN publications, all challenge the very basis of scientific ecology, the mainstream assumptions of economic development, as well as the basic political issues of who controls access to natural resources. Unfortunately, these more critical works are less accessible or palatable to many readers who *will* read, assimilate and perhaps implement the proposals for reform presented by Dankelman, Davidson and their collaborators.

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Book Reviews

Staying Alive: Women, Ecology, and Development in India

by Vandana Shiva, Zed Books, London, U.K. 1989 (US $17.50)

Reviewed by Sarah Abraham

This book conveys a powerful message—the environmental ruin and over-exploitation being inflicted on the earth is such that within the lifetime of children being born today, tropical forests and other essential ecosystems on which human beings depend may vanish completely. Within the context of India, this sobering possibility is reinforced throughout the book and cannot fail to make reading it an intense experience.

Vandana Shiva integrates vast amounts of information in a sustained and passionate attack on the "miracles" of development. She scrutinizes and exposes many of the so-called agricultural "advances" of the past generation for their impact in India. For example, she analyzes the effects of hybridization, biotechnologies, seed banks, pesticides, and what she terms the "white revolution"—the expansion of milk production from hybrid cattle. She laments the dwindling of indigenous knowledge and the accompanying disempowerment of local communities, which she links to colonial influences, and which still remain pervasive today.

Shiva is correct in emphasizing the political reality of the paradigms which underpin most development strategies; and in recognizing that the sources of those politics are embedded in "structures of patriarchy." It is a pity, however, that she does not explicitly ask what the "Western male dominated" economic system is that is responsible for the worst excesses of development. Since it clearly appears to be capitalism it would have helped to explicitly so name it, rather than keep to the categories of "modern/traditional", "West/Third World". In doing so, she also paradoxically reproduces the dichotomous categories which have plagued science and development strategies and which she has rightly and sharply criticised. Also she does not recognize the existence of class differentiation and its effect on the women she identifies as the ultimate victims of the twin evils—modern science and modern development. In essence, what the book lacks, is any discussion of the socio-economic structures that underlie environmental degradation and its effects, that would be central to a political strategy for change.

Shiva is right in insisting that colonial rule destroyed indigenous knowledge and especially women's knowledge for producing sustenance. She is also correct in identifying rural poor women as the worst victims of environmental degradation. However, by locating all environmental harm in a western model of development, as a legacy of colonialism, the book begs the question: was there no exploitation of women and/or nature before colonialism or before the scientific revolution?

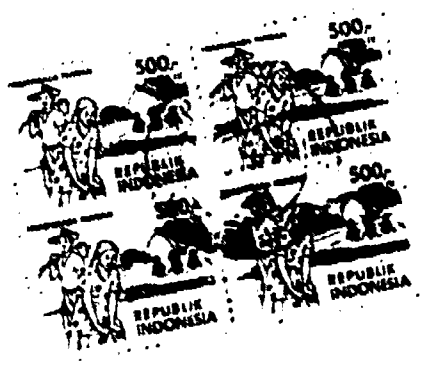
Shiva consistently associates "nature" and "women" with the traditional and non-West, lumping them together as the key props of society as well as society's most exploited members. This association is extremely harmful to all women in its uncritical acceptance of the "language of the oppressor" which has tended to define women as "nature". It is an ideology that needs to be explicitly exposed and challenged. Women, like men, are distinct from nature insofar as they consciously act on nature, sometimes "exploitatively", at other times with attention to nature's rhythms and processes. Discriminatory and violent gender ideologies and practices are socially constructed, but the power of this critique is considerably weakened if women are seen, as Shiva describes them, as "embedded in nature".

The issues of environmental devastation and its increasing burdens on the shoulders of poor, rural women must be understood in order to evolve effective counter strategies for action and change. Despite the noted analytical weaknesses in the book, it has many lessons to offer on this count and its findings deserve proper dissemination.

Sarah Abraham is a graduate student at the University of Wisconsin.

From the Field

Indonesia's Barefoot Environmental Impact Assessment



In the community of Tomohon in the Dumonga region of north Sulawesi, a geo-thermal/natural gas plant is under construction by Pertamina, Indonesia's national oil and gas company. Three natural gas wells have been drilled in residential areas, one of them a mere 100 meters from homes in the nearest kampung.

Shortly after these wells were drilled, area residents noticed they were more often ill, especially with respiratory ailments. They began to suspect the Pertamina complex as the cause. Using a participatory research technique called "Barefoot" Environmental Impact Assessment (BEIA), the community eventually persuaded Pertamina to close down the natural gas well nearest to people's homes.

Developed by the Environmental Research Group at the University of Indonesia, BEIA investigations have taken place at nine locations in Indonesia, and are currently ongoing at another four.

The objective is to strengthen villagers' ability to assess the environmental impact of events on their health homes, and jobs. Local communities usually collaborate with Wahana Lingkungan Hidup Indonesia (WALHI), the Indonesian Environmental Forum, the largest environmental network organization in Indonesia.

In most cases, a WALHI representative travels to a particular site for one to three months to facilitate BEIA research. Small committees are formed which examine particular aspects of the community's problem. For example, one committee may trace the history of the problem in the area, showing how it only affected a few people to start but grew over time to become a problem for everyone. Another may report on how the people have been forced to change their habits. The committees keep each other informed about their findings for two to six months of research. Over time, the community starts to draw connections between their behavior and the world around them. And they realize they have environmental rights.

With data in hand, the community takes action. A formal meeting is called to request redress. Those invited to attend include community members, the suspected polluter, and government officials. If a solution cannot be achieved at this stage, an impartial local mediator is jointly selected by all parties. Through negotiation, an attempt is made to bring issue to resolution. The community only turns to legal action as a last resort if all negotiations fail.

Dodo Sambodo of the Environmental Research Group believes the most successful case of BEIA to date has been the resolution of the Pertamina dispute in Tomohon. Of particular significance ... the fact that Pertamina voluntarily took a gas well out of production as a result of community action. There was an acknowledgment by Pertamina that the company bore some environmental responsibility for its actions. In Indonesia, where high value is placed on avoiding open disagreement by building consensus, the resolution of this conflict without any loss of face is an important achievement.

Despite the increase in BEIA investigations, however, problems remain. Differences in language, culture, ethnicity and religion can present barriers to building local trust and cooperation, both within communities and between outside facilitators and local groups. Maintaining solidarity within the community over the course of several months, is perhaps the most difficult task to carry through. This can be exacerbated by industry's attempts to undermine the research process by creating factions and divisions, sometimes with cash payments.

Thus, most Barefoot Environmental Impact Assessments to date have not resulted in clear victories for local people. It is true that in Tomohon, one natural gas well was closed. And in Irian Jaya, BEIA blocked mangrove swamp destruction by researching a government plan to build a harbor access road. In most cases, though, industry has declined to negotiate with local research committees, and courts have ruled in industry's favor.

Given this, the benefits for local communities may be difficult to perceive. Yet they are tangible and lasting. The cohesion that develops within the community during the research process remains. Groups continue to monitor local environmental conditions. Industry is more likely to consult with local communities about future undertakings. Local government officials have been educated about a community concern, and may be embarrassed if such a situation recurs. Media attention has resulted in greater public awareness of the impacts of environmental degradation.

Moreover, a deepening of local people's understanding of their rights as citizens fosters democracy at the grassroots. The ability of local communities to take control of decisions that affect their lives and livelihoods will be crucial to both environmental and economic sustainability in the 1990s.

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Resources and Information

Organizations and Research Centers

Centre for Our Common Future
Palais Wilson, 52, rue des Paquis, CH-1201 Geneva, SWITZERLAND. Tel (41) (22) 732 71 17, Telex 27910 ch, Fax (41) (22) 738 50 46

Centre for International Environmental Law
King's College, Manresa Road, London, S.W.3, U.K., Tel (01) 352 8123

Coolidge Center for Environmental Leadership
1675 Massachusetts Avenue, Cambridge MA 02238, (617) 864-5085

Environment and Development Action in the Third World (ENDA-TM)
BP 3370, Dakar, SENEGAL. Tel (221) 224229, 210027, Telex 51456 ENDA TM SG, Fax (221) 220702

Environmental Liaison Center
Pesticide Action Network (PAN), Africa Center
P.O. Box 72461, Nairobi, KENYA. Tel (254) (2) 24770, Telex 23240 ENVICENT, Fax (254) (2) 565 326

Environmental Policy Institute
218 D Street SE, Washington DC 20003, (212) 544-2600

Fundacion Natura
Pesticide Action Network (PAN), Latin American Center
Av. 6 de Diciembre 5043, El Comercio, Quito, ECUADOR. Tel (593) (2) 249 780, Telex 21211 NATURA ED, Fax (593) (2) 564774

Green Forum Philippines
c/o Haribon Foundation
Suite 306, Sunrise Condominium, 226 Ortigas Avenue, Greenhills, San Juan, Metro Manila, PHILIPPINES. Tel (63) (2) 721-1614, 721-1693 Telex 66089 PROS PN PHILIPPINES, Fax (63) (2) 722-4609

Greenpeace
1436 U Street NW, Washington DC 20009, (202) 462-1177

Indonesian Environmental Forum
Wahana Lingkungan Hidup Indonesia (WALHI)
Jl. Penjernihan 1/15, Kompleks Keuangan, Petompongan 10210, Jakarta, INDONESIA. Tel (62) (21) 586-820, Telex 45141, SARINAH IA, Fax (62) (21) 586-181

Institute for Food and Development Policy
145 Ninth Street, San Francisco CA 94103, (415) 864-8555

International Alliance for Sustainable Agriculture
1701 University Ave. S.E., Room 202, Minneapolis MN 55414, (612) 331-1099

International Institute for Environment and Development (IIED)
3 Endsleigh Street, London WC1H 0DD, U.K., Tel (44) (1) 388-2117, Telex 261681 EASCAN G, Fax (44) (1) 388-2826

Kerala Forest Research Institute (KFRI)
Peechi 680 653, Kerala, INDIA

National Toxics Campaign
29 Temple Place, 5th Floor, Boston MA 02111, (617) 482-1477

Natural Resources Defense Council
1350 New York Avenue NW, Washington DC 20005, (202) 783-7800

Panos Institute
1405 King Street, Alexandria VA 22314, (703) 836-1302

Pesticide Action Network (PAN), North American Center
965 Mission Street, Room 514, San Francisco CA 94103, (415) 541-9140

World Resources Institute
1709 New York Ave. NW, Washington DC 20006, (202) 638-6300

Worldwatch Institute
1776 Massachusetts Avenue NW, Washington DC 20036, (202) 452-1999

World Wildlife Fund
1250 24th Street NW, Washington DC 20037, (202) 293-4800

Publications

Books

• *Towards Sustainable Development* by The Panos Institute, Nottingham: Panos Publications, 1987. (US $15.00)
Fourteen case studies prepared by African and Asian journalists of the Nordic Conference on Environment and Development, May 1987.

• *Environmental Accounting for Sustainable Development: A UNEP-World Bank Symposium*, edited by Yusuf J. Ahmad, Salah El Serafy, and Ernst Lutz. Washington DC: World Bank Publications, 1989.
This book contains 11 papers and an overview on economic and statistical issues in environmental resource accounting.

• *The Green Belt Movement: Sharing the Approach and the Experience*, by Wangari Maathai. Nairobi: Environment Liaison Centre International, 1988.
A history and description of Kenya's grassroots Green Belt Movement, including a hands-on guide to starting and managing similar green belt efforts.

• *Cold Hearths and Barren Slopes: The Woodfuel Crisis in the Third World* by Bina Agarwal, Riverdale Publishers, P.O.Box 10, Glen Dale, Maryland 20769, 1986 (US $21.00 for hardcover, reprinted in 1989 in paperback.

• *Escape From the Pesticide Treadmill: Alternatives to Pesticides in Developing Countries* by Michael Hansen, Institute for Consumer Policy Research, Mt. Vernon NY, 1987. (US $12.00)

• *Our Common Future: The Report of the World Commission on Environment and Development*, New York: Oxford University Press, 1987. (US $10.95)
This landmark report by a United Nations Commission (known also as the Brundtland Report) presents the findings of the World Commission on Environment and Development, which collected information from over 500 sources in 14 cities from 1984-1987.

Journals

• *Sustainable Development: From Theory to Practice*, Journal of the Society for International Development, 1989, Society for International Development, Palazzo Civilta del Lavoro 00144, Rome, Italy. (US$30—institutions; US$25—individuals; US$6—individuals in low-income countries.)

• *Brundtland Bulletin*, The Centre for Our Common Future, Palais Wilson, 52 rue des Paquis, CH 1201, Geneva, Switzerland, Tel (022) 732 7117. Published quarterly. Annual subscription US$20. Provides details of agencies, research institutes, conferences and debates throughout the world on environmental issues and sustainable development.

• *Panscope*, The Panos Institute, 1409 King Street, Alexandria VA 22314. Published six times per year. US $30 per year for institutions and libraries; US $24 per year for NGOs and individuals. *Panscope* provides a forum for the Third World to articulate and disseminate its own development ideas, within the South and towards the North.

• *Kengo News*, Kenya Energy and Environmental Organizations (KENGO), Mwanzi Road, Westlands, P.O. Box 48157, Nairobi, Kenya. Tel (2) 749747. Published twice per year. *Kengo News* is a networking and educational tool, advising NGOs on activities in renewable energy and development in Kenya.

• *Garbage*, Old-House Journal Corp., 435 Ninth Street, Brooklyn NY 11215, Tel (800) 274-9909. Published six times per year. US $21 per year. First published in the fall of 1989, *Garbage* provides news and practical information on the waste stream.

• *Haramata*, International Institute for Environment and Development (IIED), 3 Endsleigh Street, London WC1H ODD, U.K., Tel (01) 388 2117. Published quarterly. US $20.00 per year for high income countries/individuals; free on request for those in Africa and the South. *Haramata* is a bulletin that examines people, policies, and programmes in the drylands of the Sahel.

• *World Watch Magazine*, Worldwatch Institute, 1776 Massachusetts Avenue NW, Washington DC 20036, (202) 452-1999. Annual domestic subscription US $15; annual international subscription US $30. World Watch raises public awareness of environmental threats and supports effective political response.

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