Eric Holt-Gimenez

In October of 1998, Hurricane Mitch, one of the Caribbean’s five most powerful hurricanes of the twentieth century, slammed into Central America causing US$ 6.7 billion in damage to infrastructure and industry (primarily agriculture) an amount approximately equal to 13.3% of Central America’s GNP. Two meters of rain in less than one week coupled with mudslides and landslides washed away crops, animals, buildings, roads and bridges. Topsoil, lost from hillside farms, silted rivers that overflowed their banks, flooding fields and urban areas. Over 10,000 people died and 3 million were displaced or left homeless. The environmental damages were incalculable. The countries hardest hit were Honduras, Nicaragua and Guatemala. All areas affected by Hurricane Mitch are characterised by an uneasy mix of large-scale plantation agriculture and extensive cattle ranching (primarily for export) alongside small, very poor, subsistence farms. The hillsides and fringes of the large holdings are surrounded by mosaics of hundreds of thousands of poor rural families who eke out an existence by farming basic grains on ecologically fragile land and by engaging in a myriad of other seasonal, part-time, informal rural and urban work. Most observers agree that the unprecedented magnitude of the disaster is the consequence of decades of deforestation, non-sustainable agricultural practices and other forms of environmental degradation that left the region exceptionally vulnerable to an erosive event.

‘Sustainable’ farms suffered less
While first reports regarding agricultural damage simply indicated that the levels of destruction were massive, subsequent on-site observations began to reveal a more subtle, differentiated pattern. Farms using what are commonly understood to be ‘sustainable’ practices appeared to have suffered less damage than their ‘conventional’ neighbours. These farms belonged to smallholders working within a multi-institutional, regional movement for sustainable agriculture (agroecology or LEISA) known in Central America as Campesino a Campesino (Farmer to Farmer). The farming practices commonly encountered in Campesino a Campesino included a wide range of soil conservation and sustainable cultivation methods, tested and promoted by smallholders for nearly thirty years. Most common amongst them were soil and water conservation methods, reduced or discontinued use of chemical inputs, cover crops, agroforestry, in-row tillage, organic fertiliser and pesticides, and different forms of Integrated Pest Management.

An opportunity to compare impact
In general, these sustainable farms exist as islands and archipelagos within a greater, conventional ‘sea’. While often localised and geographically fragmented, they provided an excellent opportunity to compare the agroecological resistance to the hurricane of sustainable farms to that of conventional farms. The presence of Campesino a Campesino Movement designed a study and wrote a proposal. Several researchers with years of experience working in the Campesino a Campesino Movement designed a study and wrote a proposal. World Neighbors, an NGO working in the region, agreed to sponsor the project, helped to find funding (Ford, Summit, Rockefeller and Inter-American Foundations), and provided administrative support.

Measuring farmers agroecological resistance to hurricane Mitch
Much interest in the study
From February through May of 1999, 40 different NGOs with sustainable agricultural research and development (SARD) projects trained and mobilised 100 farmer-technician teams and 1,743 farmers to carry out paired observations of specific agroecological indicators on 1,804 neighbouring, sustainable and conventional farms. The study spanned 360 communities and 24 departments in Nicaragua, Honduras and Guatemala. The primary objectives of participating in the study were threefold: First, farmer-technicians and NGOs in the Campesino a Campesino Movement were eager to compare their farms to conventional farms because demonstrating a higher level of agroecological resistance would imply a higher level of sustainability. After years of being told that sustainable agriculture was not ‘viable’, nor ‘economical’, they were anxious to dispel doubts about the importance and effectiveness of their practices. Secondly, NGOs were very interested in evaluating the effectiveness of years of support for farmer to farmer SARD. Commonly, these projects are evaluated on the level of implementation (number of workshops, participants, terraces, compost heaps, etc.) However, the study gave them an opportunity to evaluate the level of their agroecological impact. Finally, all participants were interested in influencing the agenda for agricultural reconstruction after the hurricane. If farmers could show that sustainable farms were more resistant than conventional farms, then a strong argument could be made for a participatory, sustainable agricultural reconstruction strategy.

A collaborative action
An intensive period of organising, training, data collection and field monitoring began in February of 1999. It was crucial that field data be collected before the onset of the rainy season in late April. Each team had one technician and two farmer-promoters. They carried out observations on the ten best examples of sustainable farms and on the ten neighbouring, conventional farms. Paired observations had to be located in close proximity, in the same position and cardinal orientation in the watershed, have the same general slope and similar environmental surroundings (fields, trees, infrastructure, etc.).

Agroecological indicators included topsoil depth, rill and gully erosion, percent vegetation, crop losses and structural damage. Each team member specialised in specific steps and measurements of the field procedure to reduce and standardise observational errors. The owners of both farms in the paired observations accompanied the team on both sustainable and conventional plots, then signed off on the field sheet indicating measurements and observations had been free of bias. Technicians interviewed farmers regarding their observations of the hurricane, the damage patterns, and the different reasons for any agroecosystem failures. National research coordinators in each country held periodic sessions with teams for feedback, troubleshooting and the correction of field errors.

Significant differences
Field data from the farmer-technician teams was entered into an interactive ACCESS database for each country. Initial results (averages) were processed for distribution among participants. While there was some local variation, the overall results indicated an overwhelming trend of higher agroecological resistance on the sustainable farms. Sustainable plots had 20% to 40% more topsoil, greater soil moisture, less erosion and experienced lower economic losses than their conventional neighbours. Statistical tests showed that some of these differences were highly significant (there was only a 0.0001 probability that these differences were due to chance) and most were acceptably significant (0.02 to 0.05).

Conventional farmers convinced
Fifteen different workshops were held in the countryside to share the results of the field research with participants and key local and municipal actors. Farmers, promoters, technicians and project coordinators collectively analysed the results and gave feedback. Sustainable farms had fewer and smaller gullies and areas of rill erosion. All of these indicators were seen as contributing to both productivity, and to the conservation of the watershed. Further, because of crop diversification, sustainable farms averaged lower economic losses, and in Nicaragua even showed profits, despite the hurricane. However, when correlated to steep slopes (>50%), high storm intensity and other extreme environmental factors, some of the differences between sustainable and conventional farms ‘collapsed’, indicating that these techniques have thresholds of effectiveness. Finally, the participants themselves indicated what could be the most impressive result of all: over 90% of conventional farmers participating in the study indicated a desire to adopt their neighbours’ sustainable practices.

A learning process
Participants enthusiastically claimed that the study had been a highly successful learning experience, and one that had established new bonds of trust between farmers, promoters and technicians. For most farmers, it was their first experience with research, and for others, the first time results of on-farm research had been returned and shared with them. The study also revealed that, at the local level, many organisations and farmer groups had mobilised themselves already in response to the humanitarian emergency situation. Farmer to farmer groups helped to motivate self-help efforts in their communities, rather than simply waiting for outside assistance. This capacity for self-mobilisation among farmer groups indicates that resilience has a social as well as a technical dimension.

Vetiver Grass for disaster mitigation
Last year, around Christmas and New Year thousands of Venezuelans had a miserable time just trying to survive the floods that have ravaged their communities and homes. Although we do not know the details of all the causes behind the flooding and mud slides, we know that when vegetation is removed and the soils become fragile, even moderate rainfall conditions can bring about a calamity.

Vetiver Grass Technology (VGT), if used to stabilise agricultural land, peri-urban building areas, deforested hillsides, riverbanks, levees, and highway embankments, could help to reduce the damage that might occur from future high rainfall in Venezuela. The Vetiver Grass Network strongly urges policy makers and relief agencies to consider VGT as an important tool for rehabilitation and to provide jobs for thousands of unemployed people.

VGT has proven very effective in the Far East for protection against cyclones, just as in El Salvador and Honduras, where it provided near perfect protection against the ravages of Hurricane Mitch in 1998. Some of these stories have been documented and can be found at: http://www.vetiver.org. The website also contains reports from other parts of the world, and information on practical guides such as:

- Training manual of the international training course on the vetiver system. Hard copies of the training manual are available from The Royal Projects Development Board. To obtain a copy email your name and address to Suwanna Pasiri. <pasiri@mail.rdpb.go.th>

- Vetiver grass - a hedge against erosion. The Vetiver Network (TVN) has published a revised (fourth) edition of this book - commonly called the Green Book. Copies available from TVN.
What’s needed for scaling up of SARD?

With the aid of drawings, clay models and skits prepared by the participants, farmers then described how their fields and villages should look in three, five and ten years hence if agricultural reconstruction was implemented using farmer to farmer, SARD techniques. Then, farmers analysed the obstacles to the scaling up and scaling out of SARD, and suggested projects and policy ideas for participatory, sustainable agricultural recovery. In general, technology and training methodologies were not seen as limiting to SARD. After all, farmer experimentation, cross visits and farmer to farmer training are the pillars of the Campesino a Campesino Movement. However, it was strongly felt that national credit, market, agrarian and research policies favoured Green Revolution technologies rather than SARD. Although NGOs had been instrumental in establishing SARD alternatives, if SARD was to scale out nationally, and scale up institutionally, proactive national policies were required to push it beyond the NGOs local ‘micro-project’ sphere of influence.

Sharing of results

Findings from these workshops were synthesised and presented by the participants at national meetings in the capital cities of Honduras, Guatemala and Nicaragua. Key actors in government, relief, development and research institutions were invited. Farmers and technicians presented their findings; the national research coordinators, the methodologist and the principal investigator gave their reports. In-country researchers in agricultural economics and disaster prevention gave topical presentations. Notable figures such as Nobel Prize winner Rigoberta Menchu, several government ministers, and representatives from the United Nations gave keynote addresses. A video of the research project (see below) was shown and distributed.

Potential of SARD demonstrated

The Campesino a Campesino Movement in Central America has demonstrated the social, environmental and agricultural advantages not only of SARD, but also of farmer-led approaches to sustainable agriculture. The study itself demonstrates the tremendous potential for research and development within farmers’ movements. While farmer-promoters within the Campesino a Campesino Movement have carried out on-farm experiments and have shared their knowledge across borders for thirty years, this was the first time ever that farmers had collaborated on a regional research project. Participants have expressed their desire to establish national and regional farmer research networks to continue their agroecological research.

Limited impact on national policies

A year after the study, the participating organisations from Nicaragua met to assess the impact of their research. Most organisations reported widespread adoption of agroecological practices at the project level by conventional farmers who had participated in the study or had heard of the findings. A number of NGOs had successfully used the study to persuade international funding institutions to support their efforts at sustainable reconstruction. Some participants were members of territorial committees and used the study to argue for sustainable reconstruction at the municipal level. One organisation gave a workshop on sustainable, participatory reconstruction to donors in Europe, and used the study as an example of the human capabilities in Central America.

Participants enthusiastically claimed that the study had been a highly successful learning experience. Photo: World Neighbors

Public pressure needed

The Mitch study has uncovered a conspicuous ‘policy ceiling’ in sustainable agricultural development. While NGOs and the Campesino a Campesino Movement have been instrumental in developing the technical and methodological aspects of sustainable agriculture in Central America, they are limited in their ability to influence the policy context. Lack of a favourable policy context, and the lack of political will on the part of national governments to create one, appears to be holding back grassroots efforts at scaling up sustainable agriculture. The next task confronting sustainable agricultural development may be to translate farmer-to-farmer successes on the ground into the broad-based, public pressure needed to influence national policymakers.

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For more information

- World Neighbors 2000. Reasons for resiliency: toward a sustainable recovery after Hurricane Mitch, and accompanying video, Changing course: recovery & research after Hurricane Mitch. Both can be ordered on-line through the World Neighbors’ web site (http://www.wn.org); by sending an e-mail to order@wn.org; or by writing, calling or faxing World Neighbors, 4127 NW 122nd Street, Oklahoma City, OK 73120 USA; phone: +1 405 752-9700; fax: +1 405 752-9393. See also page 30.