

Crisis or Sustainability? Central America's choices for recovery in the aftermath of Hurricane Mitch

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Hurricane Mitch may be the most devastating ecological event to occur in the history of Central America. This is because human impact on the isthmus over the last century transformed the original, heavily forested landscape into a widely intervened patchwork of open fields bordered and dotted by groves of trees. Pre-Colombian, slash and burn rotational systems were converted from small cultivated plots with extensive areas of forested fallow, to intensively farmed, non-rotational systems. Agriculture reduced the ecological succession of the region from multi-storied, high and medium canopy cover, to ecosystems made up of low-lying broadleaf plants, grasses, and bare soil. The ecological effect of this transformation was an overwhelming shift in the primary store of nutrients from the biomass (trees), to the soil. This shift in the nutrient store, and the corresponding disappearance of the rich litter layer in these tropical ecosystems, was accompanied by a dramatic reduction in the levels of nutrients held in these ecosystems.

Unlike temperate ecosystems, tropical soils serve more as an anchor for roots than as a source of nutrients. In these ecosystems, plants "feed" in the litter layers or mulch, where accelerated decomposition rates make relatively volatile nutrients continually available. Modern farming has been possible only by the addition of fertilizers. The change in agroecosystem structure and function from biomass to soil and from nutrient cycling to nutrient addition also removed the protective forest cover, exposing the soil and its reduced nutrient layer to intensive tropical rains. Hurricane Mitch may not have been the first hurricane to dump two meters of rain on the isthmus in less than a week, but it was the first time this large an area of Central American soil had been directly exposed to the *intensity* of that much rain, ever.

The result was devastating. However, the terrible human death tolls and loss of homes due to mudslides and flooding, (now followed by hunger and disease) are only preludes... Mitch was the disaster; the crises are yet to come.

Southern Mexico, Guatemala, El Salvador, Honduras and Nicaragua, all areas affected by Hurricane Mitch, are characterized by an uneasy mix of large-scale plantation agriculture, extensive cattle ranching (both primarily for export) and small, very poor, subsistence farms. The hillsides and frontier edges 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. Unable to make a living on their small plots, these farm families

survive through "pluriactivity": that is, by engaging in a myriad of other seasonal, part-time, informal, rural and urban work. Family members of these "minifundios" are the farmhands, construction workers, maids, custodians, drivers, craftspeople and salespeople in the markets and on the urban streets that "grease" the creaky wheels of the Central American economies. At the core of this extensive and thoroughly embedded "net-of-work", is the *minifundio*, be it owned, rented or sharecropped. It is perhaps the only integrating aspect of the otherwise fragmented existence of Central America's rural poor, absorbing the free labor of family members at peak agricultural periods, providing lodging between jobs, food to supplement poor, semi-industrialized diets, and a refuge from indigence. It is no exaggeration to say that through the pluriactive labor of their inhabitants, these small agroecosystems are connected to every aspect of Central American society. Without their continuous and pervasive subsidy to the reproduction of the labor force, Central America simply could not function. Human interdependence on primary production from these "marginal" agroecosystems is extensive and inescapable. So, while the massive loss of agricultural soil will devastate food and export production in rural areas, affecting foreign revenues and rural economies, the broader socioeconomic impact will affect not only the urban sectors of the affected countries, but all of Central America, and ultimately, the United States. The Central American immigrant population in the US was firmly and extensively established in the eighties and early nineties as the result of the US-backed counterinsurgency wars in Nicaragua, El Salvador and Guatemala. Logically, the rural poor will attempt to compensate for the loss of the key component to their livelihoods by accessing the extensive family and village networks of immigration to the US.

In anticipation of these ominous scenarios, after immediate disaster relief (emergency medical, food, housing, etc.), international aid agencies and Central American governments are already planning to reactivate the agricultural sector. Massive distribution of credit, fertilizer, insecticides, herbicides and seed will be needed for the upcoming agricultural season in April. But if the history of agricultural development is any indication of how this aid will be distributed, then most assistance will probably reach the larger plantations and ranches before it reaches the rural poor. Further, while larger holdings have undoubtedly suffered extensive damage, because larger farms tend to be situated in the rich valleys and plains, they will end up with the topsoil from the poor farmers on the surrounding hillsides. Nonetheless, the recovery effort is essential. However, this strategy, which may be viewed as short-term disaster relief, has potentially two fatal flaws. One is ecological, the other is social.

The ecological flaw resides in the fact that modern Central American agriculture is soil-based and not biomass-based. But much of the soil is simply *gone*. Whatever agricultural soil still left in place (or transported) has been washed of its organic matter, and seriously degraded down to inert, mineral

components. In these situations, simple surface additions of fertilizer have limited and at best fleeting effect on productivity. Without soil and organic matter to serve as a matrix for adsorption of nutrients, chemical inputs will volatilize or leach quickly, leaving the soil as infertile as before application. Herbicide and pesticide applications will have little effect on raising productivity if the limiting factor to production is the lack of soil itself. If hybrid seed is distributed, this will be of little help. Hybrids have been developed in conjunction with chemical inputs and grow poorly or not at all without them. Neither do they do well under adverse conditions.

Productivity cannot be addressed without also insuring *fertility*. That is, the *health* of the agroecosystem. Health includes the capacity to cycle nutrients as well as retain them. This depends on the organic matter and the biological activity of microorganisms. But how can fertility be addressed if there is no soil? Not only will chemical inputs not solve the immediate problem of productivity after massive soil destruction, they do nothing to re-establish fertility for medium and long term production. What is worse, these chemical inputs tend to sterilize the soil. Production *inputs* will inhibit fertility *processes* early in the stages of ecological succession. Applying the conventional "technological fix" to severely eroded, degraded soils is like treating a victim of overexposure with performance-enhancing sports drugs.

The social flaw in this recovery strategy is much more complex. Since the beginning of the decade, neo-liberal structural readjustment policies have imposed downsizing and decentralization of the Central American ministries of agriculture. Credit and agricultural extension services have virtually disappeared. Large-scale farms and ranches have been able to contract their own agricultural experts, but smallholders, who are the vast majority of Central America's farmers and who produce at least half of its food, were abandoned. The remoteness and sheer numbers of these farmers made extension problematic even when services still existed. Fertilizers, chemicals and seeds must be transported first by truck and then, often, by beast of burden. Advice on application, densities, and timings of plantings, weeding and pest control are site-specific, and often differ dramatically from one valley to the next, or from the bottom to the top of the hillside. Now, with the massive destruction of what poor infrastructure existed prior to the hurricane, and with the lack of experienced agricultural extensionists, how will conventional agriculture address the desperate needs of the region's smallholders? Unless options are made available, these farmers will be forced to head for what is left of the agricultural frontier. Without new options, they will rely on ancient strategy of cutting down trees to access the nutrients held in the biomass of Central America's remaining tropical forests. In all likelihood, they will be followed (as usual), by cattle ranchers happy to expand their pastures onto land cleared by free peasant labor. Frankly, the future looks very bleak

There are, however, important alternatives and resources peculiar to Central America that could be brought in to address both ecological and social aspects of this problem. In a way, the ecological disasters like Hurricane Mitch have been occurring less intensively ever since northern agriculture was introduced to tropical ecosystems. Subsistence smallholders have been continually displaced from valleys to hillsides and forests by larger, export-oriented farms and ranches. There, even as they adopted fertilizers, herbicides and pesticides, they have battled with falling productivity, soil erosion, ecosystem degradation, economic ruin, and the lack of effective agricultural services.

Nearly thirty years ago in the highlands of Guatemala, working with a simple set of principles based on local innovation and solidarity between farmers, a small movement for "people-centered development" began. Through small-scale experimentation, farmer-to-farmer training, and mutual aid, smallholders learned to adjust their agricultural practices to maintain the fertility and general health of their ecosystem. The results were not only evident in dramatic increases in productivity, but in terms of improved ecosystem functions. Long before mainline development agencies introduced "sustainable agriculture" into their project portfolios, these farmers were developing it, slowly, on the ground, farm by farm, hillside by hillside, county by county. Development agencies such as World Neighbors, OXFAM, and Servicio de Desarrollo y Paz de Mexico were instrumental in bringing farmers from different areas and countries together to learn and share experiences. What began to emerge was an agriculture that did not simply replace natural ecological processes, but *mimicked* them. What also emerged was a methodology that did not replace good agricultural extension, but *challenged* it to address sustainability as well as productivity.

After implementing soil and water conservation techniques, in an attempt to maintain fertility, an astounding "discovery" was made: Volatile essential nutrients, costly in time and labor to apply to soils, could be produced and saved in the *biomass* of leguminous cover crops and intercrops. Crops such as Velvet Bean *Mucuna pruriens*, for example, could be planted to protect soils from the impact of intensive tropical storms, and create the valuable mulch layer so critical to nutrient cycling in the tropics. With the help of a handful of NGOs, velvet bean and other leguminous cover crops were distributed, along with the knowledge of their management, from farmer-to-farmer, throughout Central America. Within five years it became a common practice. It is an example not only of a biomass-based strategy for fertility, but of a farmer-to-farmer strategy for development that effected a major change in regional agricultural practices in a relatively short period of time. This was not simply a "technological fix." It was the hard work and creativity of a network of farmers dedicated to improving agriculture in their communities.

The dramatic social-political convulsions of the Central American wars resulted in the Diaspora of many of these original farmer-to-farmer organizations in

Guatemala. Non-governmental organizations help relocate them in Mexico and Honduras, often in the villages of old "students." During the same period, with support from Catholic Relief Services and the Ford Foundation, The Nicaraguan Farmers and Ranchers Union (UNAG) was instrumental in incorporating knowledge and techniques from Mexico and Guatemala into its national network of smallholders and cooperatives. Farmers began calling themselves the *Campesino a Campesino* (farmer to farmer) movement. Then, with the help of OXFAM, UNAG promoted local, national and international farmer-to-farmer training's, symposiums, gatherings and meetings, feeding the knowledge back into the region. Over the last ten years, what began as a localized effort by poor Guatemalan farmers exploded into a regionwide movement with thousands of active farmer-teacher-innovators called "*promotores*". *Campesino a Campesino* works with dozens of NGOs from Mexico to Panama, and has introduced farmer-led processes for sustainable agriculture to the villages of well over ten thousand farmers in the region.

However, *Campesino a Campesino* has tended to fall outside of conventional paradigms and programs for agricultural development, both ecologically and socially. State extension services were committed to high-input agriculture as a vehicle for modernization. Professional farm extensionists often saw the *promotores* as competition "from below."

But the movement has remained strong, precisely because farmers have preferred developing their own agriculture based on ecological principles, to being subjected to the risks of conventional agricultural development and the inconsistency of state agricultural services. In recent years there have been encouraging experiences of collaboration between *Campesino a Campesino* and progressive sectors in agricultural development.

Campesino a Campesino holds two of the important keys to addressing the ecological crisis precipitated by conventional agriculture and raised to the lever of widespread disaster with Hurricane Mitch. The *promotores* of *Campesino a Campesino* belong to extensive networks of agroecological knowledge. Their practices are not only attuned to local ecosystems, but are culturally, socially and economically accessible to the region's poor farmers, that is, those most affected by the disaster. A regionwide recovery effort would have a much better chance of success if agencies and farmers' organizations in the *Campesino a Campesino* movement were strategically supported. International aid and development agencies could facilitate concerted, national recovery plans and medium-term development strategies with the different *Campesino a Campesino* groups active in Mexico, Guatemala, Honduras, El Salvador and Nicaragua. These groups can take advantage of the recent moves towards government decentralization, to work with local government at the municipal level in a concerted NGO-municipal-*promotor* effort to address the agricultural recovery of communities.

Several thousand promotores can, at relatively low cost, train and provide follow-up to tens of thousands of poor farmers. Productivity and fertility can be addressed to insure (to the extent that any farming can) not just the first post-hurricane crops, but to make sure production is sustainable in the medium and long term. The implications of such a strategy are not just for recovery, but for development. Hurricane Mitch has simply and painfully brought home the point: conventional Central American agriculture is ecologically and socio-economically unsustainable. It is time to learn from the examples from below. A regionwide *Campesino a Campesino Sustainable Recovery Program* could make a critical contribution to the present and future prospects of Central American agriculture.

There is saying in Latin America, "*No hay bien que por mal no venga. Ni mal que dure cien años.*" Will the biggest ecological disaster in Central America's recorded history lead to sustainable agriculture? We cannot know that answer. Beyond the realm of ecology and the efforts of *campesinos*, many factors influence Central America, suggesting many possible outcomes. But if the recovery strategy directed to region's hard-hit *campesino* majority is ecologically unsound and socially unworkable, we can be fairly certain that not only will Central America not approach agricultural sustainability, it may never recover from Hurricane Mitch.

Change comes about by people doing things differently. If there is any "silver lining" to the current disaster or the impending crisis, it may be just that: the need to do things differently, and the rare opportunity to make a major change in Central America's agriculture.