



# QUICK RESPONSE REPORT

## Hurricane Stan Response in Guatemala

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*The views expressed in the report are those of the authors and not necessarily those of the Natural Hazards Center or the University of Colorado.*

### Overview of Guatemala's History of Natural Disasters

Prior to Hurricane Stan's passage over western Guatemala and Chiapas, Mexico, in October 2005, four major flood disasters, most involving mudslides, had occurred in Guatemala during the twentieth century (1902, 1933, 1949, and 1998). The property damage caused by an earthquake and subsequent landslides in 1976 exceeded all of these flood disasters.

Fortunately, the three most recent disasters affected different areas of the country. The 1976 earthquake's epicenter was close to the geographical center of Guatemala, while Hurricane Mitch (1998) affected the eastern third of the country. The western highlands and south Pacific coast, where Hurricane Stan wreaked havoc, had been relatively free of major flooding and landslides since a Pacific hurricane in 1949.

The intervening 56 years had lulled residents of this region into complacency. As a consequence, the floodplains and steep hillsides in this overpopulated region were cultivated by subsistence farmers (primarily Maya). The river deltas and lake shores were occupied by outsiders, both foreigners and wealthy non-Maya Guatemalans seeking relief from the pollution and turmoil of metropolitan centers. The department (state) of Solola, in particular, experienced a marked population increase related directly and/or indirectly to tourism. Panajachel, the principal tourist destination, and its dozen companion towns ringing Lake Atitlan have become the nation's third largest tourist attraction.

The 1976 earthquake had an overwhelmingly affect on the rural, poor, indigenous Maya population,

killing 20,000 outright and that many more from exposure, illness, and injury complications. Guatemala City, the farthest east of the epicenter where major losses were incurred, lost many residences of unreinforced adobe or cement block wall construction, especially in the ravine shanty towns on the city's margins. Very few lives and homes of middle and upper class Guatemalans were lost, leading to the characterization of the disaster as a "class-quake." At no risk of offending his own circle of friends, the archbishop blamed the tragedy on its victims' sins.

Massive aid poured into Guatemala, and the government wisely chose not to profiteer from its distribution. Foreign governments, the United Nations, churches, and nongovernmental organizations (NGOs) donating assistance were given free reign in distributing aid, and the military was instructed to assist unobtrusively in its distribution as needed. In my own case, working with neighbors from the United States under the auspices of the American Friends Service Committee in concert with Oxfam, we enjoyed complete independence in purchasing and distributing basic tools, such as wheelbarrows and shovels, for the residential cleanup requisite for rebuilding.

Guatemala's public image thereby benefited from a congratulatory media, in sharp contrast to denunciations of the Nicaraguan government's profiteering from earthquake aid sent several years previously to Managua. In contrast to the Guatemalan government's exemplary conduct, local communities left to deal autonomously with multitudinous providers of aid quarreled with neighbors, as well as internally, primarily along lines of religious and political allegiances.

In retrospect, we contributed to, even as we benefited from, a leadership vacuum that permitted the army to quietly but effectively infiltrate the midwestern highlands. These military “ears” remained after the emergency phase of relief aid distribution ended in anticipation of the western highlands becoming another front in a civil war that the Guatemalan government had been waging against guerilla insurgents in the eastern highlands since the early 1960s and would continue to wage in a conflict engulfing the entire country until peace accords were signed in 1996. The political implications of the 1976 earthquake were profound and continue to haunt the nation. The political legacy of Hurricane Stan may be comparably grievous given the social and economic problems facing Guatemalans even before Stan’s arrival.

## **The Research Context and Hypotheses**

My application to the University of Colorado Natural Hazards Center’s Quick Response program for a grant to fund a reconnaissance tour of southwestern Guatemala during November 2005 was prompted by the knowledge to be gleaned in the coming months concerning Guatemala’s resiliency (or, more likely, fragility) as measured by present preparedness to cope with major disaster. Of related concern was the plight of the roughly 286,000 Guatemalans directly affected through loss of life (1,500), loss of or damage to homes (9,000 and 26,000 respectively), loss of crops ripe for harvest on which subsistence farmers depend for food and income (up to 80 percent in the hardest-hit area), loss of farmland indefinitely if not permanently (20-30 percent in communities of Solola), and reduced seasonal employment in export industries, notably coffee, on which many without sufficient farmland depend (a majority of indigenous families).

The region affected by Stan produces most of Guatemala’s coffee. More migrant laborers than normal looked to coffee-related seasonal employment during the 2005-2006 winter and found reduced need for their labor due to the roughly 20 percent reduction in harvestable coffee over the hurricane-affected region. Given the sobering reality that this region had the highest indices of poverty before Stan, substantial loss of life due to malnutrition, exposure, and related illnesses is virtually certain during 2006. As bad luck would have it, this winter already evidences greater severity throughout Guatemala than any in many decades.

Guatemala’s human development index (HDI), which is measured in terms of life expectancy, per

capita productivity, adult literacy rates, and school enrollment, is the second lowest in the hemisphere behind Haiti. The most worrisome statistic comes from the United Nations Children’s Fund (UNICEF): the rate of malnutrition among indigenous children before the hurricane was 67 percent.

Within Guatemala, the department of San Marcos has the lowest HDI with 85 percent of the department’s citizens living in poverty, 62 percent in extreme poverty, 60 percent without running water to their homes, 94 percent without sewage disposal, and 88 percent without electricity in their homes. Sadly, San Marcos was the department hardest hit by the hurricane and had the highest incidence of interruption of existing water delivery and sanitation systems.

The department second to San Marcos in losses sustained is Solola, which encompasses the eastern half of Lake Atitlan, the second largest lake in Guatemala. My anthropological research over the past 42 years and that of my University of Chicago mentor, Sol Tax, over the prior three decades dating back to 1933, was centered in this lake basin. My wife and I are among the several thousands of foreigners who have acquired land for part or full-time residence in the lake basin over the past half century. In our case, this is lakeside property and a vacation home in Tzununa, one of the oldest Maya communities ringing the picturesque lake. We were among the first outsiders to acquire property in the community, and Tzununa was the last of the lake communities to allow such foreign incursion. I postulate that Tzununa’s cultural conservatism and geographical isolation worked to the community’s disadvantage following Stan in the level of outside awareness of needs and the community’s comparative lack of preparedness to compete for the predictably insufficient postdisaster relief and recovery funds.

Accordingly, my interests include doing what I can to address these two disadvantages facing Tzununa in recovery. Prior to leaving for Guatemala at the end of October, \$2,500 in disaster aid was donated by alumni of 25 consciousness-raising travel/study tours that my wife and I directed in Guatemala over the past two decades. We expect this amount to grow following dissemination of this report. Pro-Lago is likely to be the principal recipient agency. It is a Guatemalan NGO dedicated to the lake’s ecological health as well as to the basin’s water resources management for human welfare. Pro-Lago has established a hurricane recovery account and agenda, and, fortunately, almost all of the 250 alumni of our tours have been introduced to the president

and vice-president of Pro-Lago through four presentations on the lake's history/anthropology, geology, and ecology.

I speak a bit glibly of recovery from Stan, even as I fear that time may be running out for most of Guatemala's 13 million citizens, over 1 million of whom are working legally or illegally in North America. Guatemala is about the size of Ohio, but its population is two-thirds that of Canada. In terms of natural resources, Guatemala may be one of the richest countries in Central America. It has some petroleum and mineral reserves but primarily very productive volcanic soil. The poverty and development indices summarized above result from having the hemisphere's greatest inequality between the haves and the have-nots. Indeed, Guatemala ranks third in the world, behind only Namibia and the Central African Republic, in wealth inequality.

The department of San Marcos best illustrates this problem: 47 percent of the department's acreage is owned by 1 percent of its citizens and is dedicated to commercial farming. The small holdings, of which 52 percent are owned by largely indigenous landowners and dedicated to subsistence agriculture, constitute only 3 percent of the department's acreage.

Advocates and opponents of the Central American Free Trade Agreement (CAFTA), the expansion of the North American Free Trade Agreement to include Central America and the Dominican Republic, which commenced in January 2006, sharply debate whether it will brighten or dim the future of the poor in class-divided Guatemala. Personally, I would not rule out the possibility of long-term, per capita economic growth if environmental conditions remain constant. I qualify by saying "long-term," since there is general agreement on both sides of the CAFTA argument that in the short term the plight of the poor in Central America will improve little, if at all, and could worsen.

I shall argue that for most of Central America and, especially, for the bellwether country of Guatemala, there is no long term. Guatemala has the bad fortune of its ominous poverty indices and its location in Central America, where both Pacific and Atlantic hurricanes coupled with seismic activity will continue to set the country back. After observing the devastating potential of even a comparatively low-force hurricane, such as Stan, with no wind damage whatsoever and considering the likelihood of hurricanes increasing in number and intensity in the years immediately ahead, I believe that time

is not on Guatemala's side. With Stan surpassing Hurricane Katrina in terms of its national disruption—1 of every 45 Guatemalans was directly disadvantaged economically and 1 of every 6 was affected indirectly—and given Guatemala's fragility compared to the United States, I suspect that Guatemala already has run out of time.

The next year will tell us much, even without another Hurricane Mitch from the Atlantic or another Stan from the Pacific. Another comparable disaster in the near future could usher in "the coming anarchy," to borrow the title of Robert Kaplan's book. The Guatemalan Human Rights Commission/USA reports that 2005 has been the worst year for human rights abuses in Guatemala since the signing of the peace accords a decade ago.

Pending U.S. congressional decisions regarding the continued accommodation of Latin American illegal migrant workers, including the Guatemalan government's petition to exempt Guatemalans from any restrictive legislation for the first half of 2006 because of Stan, will have great consequence for the level of recovery possible in Guatemala. The vast majority of these migrant workers regularly send financial assistance to their Guatemalan relatives, and a disproportionate number of such migrants come from the region impacted by Hurricane Stan.

Tzununa, interestingly, has yet to send any resident northward, which I believe is due to its cultural conservatism. Tzununa is the lake basin's most conservative and, consequently, the poorest and most vulnerable of Solola's 20 counties. It also was one of the communities hardest hit in terms of per capita loss of cropland from mudslides. The entire community of 560 residents was summarily evacuated at the height of Stan's precipitation and mudslides due to fears of a repetition of the 1949 mudslides. The mudslides of 1949 denuded hillsides and covered most of the narrow delta's floodplain with many feet of mud and rock, requiring relocation of the town's residential center to higher ground. Tzununa fared somewhat better during Stan. Only six homes were swept away, and miraculously, the river's channel divided above the newly completed school, which was unwisely constructed in the floodplain, leaving the building intact.

The evacuation during Stan was instigated by Mayas on safer terrain across Lake Atitlan, who sent all available launches to Tzununa to ferry residents to San Pedro, where many Protestant churches were providing food and lodging free of charge for the subsequent three days. This occurred despite Tzununa's almost wholly Catholic population in a



region marked by Protestant-Catholic rivalries over the past 70 years. The spontaneous evacuation of Tzununa was a major humanitarian contrast from the intercommunity conflicts in the wake of the 1976 earthquake. Despite Tzununa being essentially deserted for three days, incidents of looting were minimal.

To the extent that Guatemala is a bellwether for potential economic advancement in Central America, Tzununa is a useful bellwether for the rural, predominately Maya communities of Solola. It behooves us to monitor what happens in Tzununa in the year ahead, in concert with community developers and scientists monitoring the Stan-impacted region as a whole. To this end, I established contact with, obtained data from, and will remain in contact with the United Nations Development Program office in Guatemala, the government's Ministry of Agriculture and Live Stock, Oxfam, and Lutheran Disaster Services.

Within the context described above, I examined the following hypotheses from October 31-December 1, 2005. They derive from comparisons at the community level between the responses to the earthquake of 1976 and to Hurricane Stan. The principal hypothesis is that in contrast to the 1976 earthquake that affected Mayas and non-Mayas so differentially and inequitably, the mudslides and flooding of Stan more universally affected everyone residing in the impacted region, including the wealthy Guatemalan owners of most of the southwestern coastal littoral and highland terrain up to 6,000 feet in altitude that is suitable for export crops, particularly coffee. Moreover, the last several decades of comparably disaster-free living in the Solola area have greatly increased the numbers of non-Maya, full- and part-time property owners in the Lake Atitlan basin. This combination of more egalitarian risk and increased proportion of non-Maya to Maya occupation, particularly in the vicinity of Lake Atitlan, may have resulted in more interethnic, interclass, interreligious, and intra/intercommunity cooperation than was the case in rural Guatemala in 1976.

The second hypothesis is that the effectiveness of a variety of residential construction and floodproofing strategies, including river channeling levees and storm-surge protection walls of stone and cement, will have been put to the test. The third hypothesis is that because of the reduction of military bases around the lake from two and to none over the past 15 years due to stipulations in the peace accords of 1996, the military will use this opportunity to

strengthen its presence in the midst of growing economic violence and lawlessness. Prior to my departure for Guatemala, the media reported one lakeside community's refusal to accept military assistance in searching for survivors of mudslide-buried residences. This community, Santiago Atitlan, had been the location of one of the two military bases during the civil war and the scene of a massacre of civilians by soldiers shortly before the war's end. Residents appealed successfully to then president Vinicio Cerezo to close the base.

## **Hurricane Stan's Impact and Response**

I focus primarily on the eastern and western-most departments impacted by Stan, Solola and San Marcos, respectively. As reported previously, they also are the two hardest hit among the 15 departments affected. I spent most of my time in Solola and three days in San Marcos.

Of the estimated 286,000 individuals across western Guatemala directly affected, 38 percent lived in San Marcos and 10 percent lived in Solola. Of the dead and missing, 64 percent lived in Solola and 26 percent in San Marcos. Of those injured, 54 percent were in Solola and 8 percent in San Marcos. Of the roughly 35,000 homes lost or damaged, 62 percent were in San Marcos and 12 percent in Solola. Each of these departments had 16 percent of the total number of citizens who required emergency shelter, many of whom subsequently found refuge with relatives.

How disastrous an extreme event, such as a hurricane or earthquake, becomes often depends on the time of day and year it occurs. The earthquake of 1976 struck between 4:30 and 5:00 a.m. in early February. Mayas customarily arise after 5:00 a.m. The number of deaths and injuries were high largely because everyone was asleep indoors, adjacent to the heavy adobe walls that fell on them. The weather was at its most inclement, and the cold aggravated the respiratory illnesses that wind-blown dust produced for weeks following the earthquake.

Similarly, Stan occurred during the time of year when precipitation is a daily occurrence throughout Guatemala. For two weeks prior to October 3-4, 2005, there had been almost constant precipitation. The precipitation had been coming in waves that gave periodic hope of abatement. Local, state, and national government officials had not issued evacuation orders, or even high-alert warnings, because of this pattern and the lack of timely information from southeastern Chiapas, Mexico, where Stan had made

landfall. The country was, therefore, largely unprepared for the six hours of torrential downpour after midnight on October 4, which rapidly increased the riverine flooding that until then had been judged manageable. The sliding of already saturated hill-sides occurred largely during this six-hour deluge.

The 150 residents in the community of Panabaj, an outlier of Santiago Atitlan in Solola, had no time to evacuate their homes before being buried under several yards of mud, rock, and vegetation. The interment of several smaller populations across the region was also reported, but the great majority of the 1,500 deaths occurred in floodplains that filled with astonishing rapidity and fury through the night.

Eighty-seven homes within the levee-protected floodplain of Panajachel's San Francisco River in Solola, along with cropland and debris from that river's watershed, were washed abruptly into Lake Atitlan. The longer rivers to the west flowing to the Pacific had more time and drainage area to affect much broader swaths of cropland and lowland cities. Ninety bridges were damaged or totally washed away, and highways became impassable at many locations across western Guatemala for up to two months thereafter. Seven weeks following Stan's passage, the drive from Panajachel to the western sector of San Marcos took eight hours, twice as long as normal.

The Guatemalan government received praise for attending as rapidly as it did to infrastructure restoration, especially for restoring access to tourist destinations, such as Panajachel and Lake Atitlan. The national tourism office lobbied for this priority with this statement: "the way most rapidly and usefully to help Guatemalans is to restore normalcy to tourism." With international headlines initially featuring the Panabaj mass burial and tourists stranded in Panajachel, Mexican tourism officials were on the scene as soon as bridge and highway access permitted to seek assurance that this important link on the Mexico-Guatemala-Honduras-Belize "Royal Road of the Maya" would not long depress the flow of tourists to the wider region.

However, infrastructure is more than transportation, and while highways and bridges are almost 100 percent operational by now, the losses in rural schooling and medical facilities will be redressed slowly, if at all, during the school year commencing in January. Within all 15 affected departments, 106 counties reported damage to 772 schools; 32 of which were washed away completely. One of the latter was in the community adjacent to Tzununa,

where literally every vestige of formal learning in the community, including a public library, unusual for rural Guatemala, ended up in the lake. Seven and a half million dollars are needed to repair and replace school buildings and supplies, which were inadequate before the hurricane to meet the needs of the fewer than half of school-age children enrolled in public schools. In Tzununa, six pupils share each textbook.

Many fewer communities enjoy local clinics than have schools, but the per capita services available medically have been reduced by Stan on a scale comparable to educational losses. Tzununa has no clinic. Because of this, three North American and outsider Guatemalan owners of lakeside properties in Tzununa, one a nurse fluent in the native Maya language, devoted three days to administering health care from a local store following the hurricane. They gave antibiotic inoculations and treated wounds until discovering that highly contagious and debilitating head lice and scabies (subcutaneous mites) were endemic in the community, lowering resistance to more lethal infections. Approximately, \$1,500 was donated to these medical needs, benefiting 150 patients.

Last to be discussed, but first in importance, are the food shortages that Stan has precipitated. By all accounts, many tens of thousands of individuals will need supplemental food rations for up to a full year. The extent of crop losses is difficult to assess given the poor state of official measurement of indigenous subsistence agricultural productivity. Preliminary estimates of subsistence agriculture losses, as reported by the press and garnered through my interviewing of residents in the communities at the northwest end of Lake Atitlan, range from 20 to 30 percent of the staple crops (corn and beans) and fruit trees (bananas, avocados, plums, and citrus fruits). Nationally, over 100,000 farm animals were lost. Commercial export agriculture, including coffee, sugarcane, rubber, and fruits, is more easily inventoried.

Guatemala's Ministry of Agriculture and Livestock (MAGA) initially released grossly inflated estimates of total agricultural losses of \$400 million. This may have been from faulty data collection or to impress outside funding sources with the severity of Guatemala's crisis. Shortly before my return to Colorado, MAGA released a revised estimate of \$46 million in total losses, which may be reasonably accurate. The breakdown for agricultural losses is 46 percent in basic grains, 20 percent in vegetables, and 8 percent in fruits and other products, all basi-

cally for in-country consumption, and 26 percent in production for export.

However, these estimates do not include coffee losses, which are not known yet. For coffee losses, I have only the informal inventory of losses reported by two agricultural engineers who interviewed a sample of 12 major coffee producers in selected coffee production regions within two weeks of Stan's passage. In the eastern part of the affected region (around Solola), losses were heaviest from mudslides and included loss not only of part of this winter's harvest but also of coffee trees. Farther west (around San Marcos), heavier precipitation and, hence, greater defoliation resulted in a greater percentage loss of this year's harvest. The estimation of coffee tree losses is complicated by the greater incidence of a leaf-blighting, tree-killing fungus called "rooster's eye," which is ubiquitous in the region but only a major problem when precipitation is unusually high. Factoring in these variables, the coffee growers were anticipating a 10-20 percent loss in this winter's production.

Given the decline in coffee profits over recent years and the barely breakeven status of the industry before Stan, even a 10 percent loss is critical. The one coffee finca I visited in November (and several times in the past) has been slowly shifting from coffee to macadamia production, a process that will accelerate now due to the estimated 20 percent loss of trees to rooster's eye. Macadamia, like coffee seedlings, take up to seven years to reach full production. For the small-scale indigenous coffee producers in the Solola region, such replanting will be a risky investment.

In late November, MAGA took an inventory of destroyed cropland and fruit trees in Tzununa (and I assume in the rest of Solola's 19 counties). I was told the inventory was preparatory to requesting an emergency 2005 supplemental budget increase by the end of the fiscal year in December. The government already had granted an extension into 2006 for expenditures of agency budgets for 2005. Consequently, a multitude of agencies were more or less legitimately qualifying for supplemental funding because of the Stan crisis and were rushing around collecting data in a hasty, uncoordinated fashion.

The Tzununa landowners who happened to be at home the day the MAGA official invited them to a public meeting to register their losses came away from the impromptu meeting with the hope that the purpose of the inventory was to prepare for lost cropland compensation. While to my knowledge no such compensation was promised, the rumor quickly

circulated that individuals losing maize and bean acreage would be compensated about \$50 per cuerda (about half an acre) and those losing coffee trees would receive about \$125 per cuerda.

There is no precedent for disaster aid of this magnitude to subsistence farmers in Guatemala, and the directors of Pro-Lago suspected that MAGA was playing the common game in Guatemalan politics of using any crisis as an excuse to obtain emergency funds for which, especially at the end of the year, there is less scrutiny of accounting. It is doubtful that Tzununa landowners will see any compensatory funding for lost crops or cropland, even if such funding were allocated. Political allegiances govern who gets any assistance local authorities receive, and Tzununa is especially vulnerable on this score given the morals of its current leadership.

The National Assembly's initial response to Stan's devastation was to approve, in early October, immediate allocations for food and shelter relief to affected counties. The amounts were the same for all counties regardless of their comparative losses, and some counties far removed from the impacted region appeared on the list. The result, whether or not fraud was intended, gave the appearance of impropriety.

At a press conference called by the National Office of Human Rights in Guatemala City on October 12, an ad hoc "emergency committee" of Mayas formed by elected Maya officials in Solola, formally accused the governor's office of theft of some government allocated supplies and favoritism in distribution of the remainder among the state's 19 counties. At the county level in Solola, accusations of similar mismanagement by local mayors were rampant.

In Tzununa, it was painfully obvious that the mayor was using the aid to strengthen his political base and line his own pockets. He ordered that the previously mentioned three private medical care providers turn over their medical supplies to his office. When they refused, he ordered the individuals digging out the one road connecting Tzununa to the outside world, which was needed to receive the federal food packets, not to clear the road in front of the store being used as the emergency clinic. The three medical providers then obtained the use of a bulldozer from the fairer-minded mayor of the adjacent town that lost its school and library.

Because the government prior to the one now in power was so incredibly corrupt, similar to many recent administrations, Guatemalans cynically have come to assume this of public leadership at all levels until demonstrated otherwise. While the present

and more accountable President Berger struggled to provide requisite leadership in responding to Stan, he and the Guatemalan citizenry were rewarded in November with the news of Mexico's decision to extradite to Guatemalan authorities the former president, Alfonso Portillo. Portillo had moved to Mexico immediately after being voted out of office two years ago to avoid answering anticipated charges of corruption. To President Berger's chagrin, a few days later, the two top officials in Guatemala's agency combating drug trafficking were arrested in Washington, DC, for possession with intent to sell some of their office's interdicted drugs. The two officials had been appointed to their posts six months after the dissolution of the predecessor drug-fighting office for comparable criminal activity. Poor Guatemala.

As observed previously, the timing of Hurricane Stan was critical. There would have been fewer deaths, injuries, and property losses if the hurricane's fury been unleashed in daylight. The timing at the end of a heavy rainy season, just ahead of the principal harvests, during the coldest time of year, and nearing the end of the fiscal year was most unfortunate.

## Conclusions

The principal hypothesis of this research postulated that the greater sharing of property losses across the divisions of ethnicity and wealth from Hurricane Stan than from the 1976 earthquake would produce more cooperation and compassion among and within communities. This was largely substantiated. Rich and poor, Mayas and non-Mayas, and Protestants and Catholics cooperated in evacuation efforts, relief provision, and in seeking government assistance.

The role of the Guatemalan government relative to foreign governments and private philanthropy was markedly more prominent and essential than following the 1976 earthquake, at least during the immediate relief phase of response. The government rerouted existing loans from the World Bank and Inter-American Development Bank for reconstruction. Whether the general public will continue to support belt-tightening by the government beyond the emergency relief phase to comply with longer-term promises to hurricane victims remains to be seen. I anticipate that international public and private assistance will have to increase significantly relative to the funding available from the Guatemalan government during the long-term reconstruction. If

requisite international assistance is not forthcoming, then the suffering in the country's far west, especially San Marcos, could become out-of-sight and out-of-mind to the government in Guatemala City, where so many problems exist and one-third of the total Guatemalan population lives.

Government subsidization of losses probably will go disproportionately, if not entirely, to commercial agricultural producers. In San Marcos, where the majority of the poor depend on seasonal employment in the coffee industry, the welfare of the rich also influences the welfare of the poor. By contrast, in Solola, where large corporate farms are fewer and the coffee production is dominated by small-scale indigenous growers, it is more tourism than agriculture, as well as the large number of foreign residents, that produces a similar economic symbiosis across the divisions of class and ethnicity. While tourism negatively affects the cost of living for the poor in Solola by inflating food prices in local markets, this is largely offset by the participation of Maya and non-Maya in producing and marketing for tourists' consumption. For somewhat different reasons, therefore, the interconnectedness of livelihoods in both areas has contributed to humanitarian cooperation and sharing in the relief phase of the post-Stan recovery.

There are many instances of intra- as well as intercommunity cooperation and sharing, such as the evacuation of Tzununa residents to higher ground across the lake and Pro-Lago's organization of some 75 volunteers for three days of debris cleanup in the Panajachel floodplain. I learned of no significant religious friction between Catholics and the many Protestant sects. Indeed, both Protestant and Catholic churches everywhere provided refuge for those displaced. During Stan, in contrast to the 1976 earthquake, the rain descended as ruthlessly "on the just as the unjust fellow." This time around the archbishop discreetly chose not to publicly suggest that those affected were being judged for their sins. Sadly, however, our Maya neighbors in Tzununa did assume that somehow they had themselves to blame. They set about picking up the pieces of their lives, stoically assuming that no one owed them assistance.

I have said nothing thus far about the amount of foreign relief and reconstruction assistance actually donated and pledged to date. As of November 15, 2005, the aid received from abroad for the most immediate needs of providing food rations, medical care, and emergency shelter totaled \$4.5 million toward the total of \$46 million needed for recon-



struction. Considerably more, including \$2 million from the United States, had been pledged, but the record for international honoring of pledged disaster assistance is poor, as evidenced by the small fraction of pledged aid that materialized in the aftermath of the 2004 Indian Ocean tsunami.

Perhaps more useful than money from the United States, would be the requested facilitation of a continuing flow of Guatemalan immigrant workers northward and the reverse flow of their earnings to relatives back home. Similarly, a delay is warranted in the implementation of the provisions under CAFTA that eliminate existing subsidies assisting the poor with adequate food supplies. In the long run, the increased employment in Guatemala (expanded beyond agriculture) that CAFTA promises may enable migrant laborers to remain at home with their families. This is the more humane course to pursue. A receptionist in the dentist's office where I had an appointment while in Guatemala City volunteered that her husband had been working for the past four years in the United States. They had yet to feel that they could afford for him to return home to visit her and their children. We, in the United States, have little appreciation for the emotional price the poor, and even the family of the middle-class receptionist, pay in relying on migrant labor simply to afford a marriage and family in absentia.

The research hypothesis regarding the military's role in the relief effort awaits passage of more time for adequate testing. In addition to the incident reported in the U.S. press of the rejection of proffered military assistance in the community of Panabaj, I learned of no other proffered or rejected military assistance in local communities. The military presence in the principal cities of Solola and farther west following Stan was heavier than normal but understandably so. Lutheran Church Services personnel interviewed throughout the affected region concerning, among other things, the level of satisfaction with the relief response. In the capital city of Solola, the heavy military presence was universally decried among those who were interviewed (largely Mayas). Although the military was involved to some degree in relief delivery at some locales, they were most needed and visible in facilitating the flow of commerce, including tourism, at locations where damaged bridges and highways remained at risk to further failure.

Regarding the fate of structural experiments in protecting residences and communities from riverine flooding and lakeside storm surge, I was surprised to find so few lakeside residences belong-

ing to the wealthy visibly damaged by Stan. Damage that was visible was dramatic and resulted primarily from landslides but also from the redirection of river flows in floodplains. In Tzununa, about half of the two dozen foreign-owned properties (mostly lakeside) were damaged minimally or destroyed in terms of utility for home construction. Fortunately, ours was not impacted, thanks to its selection on the basis of altitude and distance between Tzununa's two rivers. Stone and cement sea walls were destroyed in many locations.

I participated in a Panajachel meeting of local and state officials, engineers, and scientists called to brainstorm options for mitigating future losses from flooding of the San Francisco River. Much of the rock and cement levee system that Sol Tax and I watched evolve over the past 70 years of our combined anthropological involvement in the region had finally failed. One bridge had been swept away, and one farther up the valley had survived.

By good fortune, an American hydrologist trained at Pennsylvania State University under a professor schooled in Gilbert White's floodplain management philosophy had been present during Stan's passage over Lake Atitlan. He was residing in the Maya community adjacent to Tzununa where the school and library were destroyed. He immediately set about surveying the floodplains between his community and Panajachel and already had concluded that restoring Panajachel's river levees, but with more knowledge and stricter enforcement of a decree forbidding residence within the levees, is the only option available short of abandoning the delta. The river's gradient is too steep and space upstream too limited for temporary impoundment of high water to slow the river's flow. Panajachel's 10,000 residents will have to realize that everyone is living in the river's floodplain, regardless of levees.

The National Assemblyman attending the meeting opined that tourism's importance to the national economy would ensure that whatever it takes to maximize the effectiveness of restored levees will be done. No one asked whether feeding tens of thousands of destitute Guatemalans for months to come would enjoy comparable priority. We shall see whether the city elders follow through on forbidding occupation within the reconstructed levees and use the area for recreational open space, as those present at the meeting readily agreed makes good sense.





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