

But such methods are no panacea for landslips. Jon Hellin, a British academic, had been experimenting with these same methods of soil conservation on trial plots above Choluteca. Most of the trial site was washed away by Mitch.

Any traveller within Honduras after the disaster would have noticed how many landslips appeared to be related to roads built on hillsides. By creating an artificial 'shelf' part of the way down hillsides, road construction steepens the slopes above and below. On mountain roads, such as the country's main highway south from Tegucigalpa to Choluteca, the outer edge of the road broke away in many places, falling into the valley below. Meanwhile the rocks on hillsides above, exposed by road construction, plunged down onto the highway, often blocking it.

Other landslips were connected to mining activity. A USGS survey within the El Tigre National Park, some 40 kilometres from the capital, found a slide four kilometres long and 60 to 80 metres deep, made up of waste from an old gold mine at El Resario, which had been dumped in a gully. During the rains, the mine apparently filled with water and overflowed into the tailings pile. The resulting slide inundated the historic mining town of San Juancito.

Walls of water

There is increasing evidence that the heavy floods in Tegucigalpa partly resulted from the breach of dams and lagoons upstream in the hills to the south. What many described as a 'wall of water' struck the city shortly before midnight on 30 October. USGS investigators reported that, shortly before this time, three upstream reservoirs were breached or unleashed exceptional flows.

First to go was the Los Laureles reservoir, which spilled at 22:45. The cascade of water caused downstream flooding in the River Guacerique, which extended into the southern suburbs of Tegucigalpa, where the river merges with the Choluteca, the main river through the capital. Here 40 homes slid into the river and at least 20 people died.

Second to go was the Concepcion dam on the River Choluteca, ten kilometres south of Tegucigalpa. Already full before the rains started, operators reacted to the threat of its destruction by making what they logged as a 'high-flow release' over the reservoir's spillway at 23 00 that night. Peak flow towards the capital was 760 cubic metres a second. It was enough to scour the spillway and channel downstream.

Box 3.1 Pespire's litany of destruction

In the southern town of Pespire and the community around it, Mitch destroyed 324 houses in seven *colonias*, leaving more than 3,000 people homeless and 41 dead. Six weeks later, the town secretary Reina Beticia Molina, seated in the beautiful colonial town hall which survived the disaster, read the litany of destruction from a scrap of paper: three bridges, 13 schools, two churches and one health centre gone. Twenty-five water mains broken, 896 acres of maize lost, plus 1,251 acres of rice and 392 acres of beans, 109 cattle lost. Refugees were being billeted in schools and private homes. She had five families in her house alone.

She said: "A wave of water ran through the town around midnight very fast, and there were rocks falling from the cliffs." In the town itself, most people had fled the rising floods and only three died, but in surrounding *colonias*

many died from rock falls. We toured several blocks of total devastation, about one hundred metres from what was by then a small, placid river that you could wade across, but which days earlier had risen by some 15 metres and surged through the lower town.

The town's menfolk had repaired most of the water mains, which carried spring water from surrounding hills to the town. The day I was there the mayor was in the capital seeking funds from the government and banks. They wanted to plant a park on the flooded land and buy new land to rebuild homes elsewhere. The Roman Catholic community, whose 200-year-old colonial church was the largest refugee centre in the town, had already committed cash. The task of reconstruction for this community of 30,000 people, a tiny speck on the map of Honduras, looks daunting. But they have begun.

Finally, and probably most damagingly came the failure of the Laguna de Pescado. This natural reservoir, just south of Tegucigalpa on a tributary of the Choluteca, formed some years ago after a landslide blocked the river. The authorities never got round to removing it and this year heavy seasonal rains during October had filled it to the brim. Then, at about 23:00 on 30 October, locals told investigators from the USGS that “a large proportion of the natural dam failed, sending a flood wave down the channel” The level of the Choluteca quickly rose by several metres.

Similar stories may explain other ‘walls of water’ that hit other towns. Pespire, for instance (see box 3.1), suffered an extraordinary river surge and is also just downstream of a large dam.

The country’s largest dam, the El Cajon hydroelectric reservoir on the River Humuya, survived the floods – just. At one point, water in the reservoir was two metres above its design capacity. Operators evacuated about a thousand people living downstream while they carried out an emergency lowering of the water level. But the reservoir’s future remains in doubt. Mitch reduced the capacity of the reservoir, which can supply up to a third of the nation’s electricity. The flood waters from the deforested catchments of the Humuya and Yure rivers that feed the reservoir brought down large amounts of silt and debris from landslips, which has reduced the storage capacity of the reservoir.

Demography and poverty

Neither Honduras nor Nicaragua is overpopulated by the standards of most Asian countries. Honduras’s population density is just 51 per square kilometre. But the population is rising by 3.1 per cent a year, one of the highest in the world. It has quadrupled since 1950 to more than six million. This increase, combined with poverty and continuing urbanization has led many of their cities to house people in disaster-prone situations on riverbanks and steep hillsides. Tegucigalpa, for instance, has built onto both the floodplain of the rivers that run through it and the steep hills that surround it. Few doubted that these were undesirable places to live, since only the poorest people in the meanest accommodation with the worst services lived there.

A study of the macro-economics of Honduras is beyond the scope of this chapter. But the scale of the disaster that has hit the country cannot be disentangled from its status as the second-poorest country in the western hemisphere (after Haiti). Its poor health services and other infrastructure and emergency services left it ill-equipped to cope. Among its many economic problems are an international debt which, at around US\$ 4.5 billion, comfortably exceeds its annual GDP (requiring almost 40 per cent of government spending to service), and an over-reliance for its foreign currency on a few cash crops – bananas, coffee, melons, sugar, timber, pineapples and shrimps. The latter is a legacy of its domination by a few foreign corporations. Not for nothing was Honduras the first country to attract the disparaging label ‘banana republic’.

The destabilizing legacy of the banana continues to this day with what the country sees as blatant discrimination against its crop by the European Union (EU). Despite Nicaragua and Honduras having a large share of world production, the EU restricts their slice to just seven per cent of its own market, giving preference to former French and British colonies. American banana growers in Honduras, including Chiquita and Dole Food, have taken the issue to the World Trade Organization.

Aftermath

Honduras proved, in many ways, far more resilient to Mitch than outsiders had supposed in the immediate aftermath of the hurricane. In the first few days, large amounts of food aid were sent to the country. The US government alone sent 3,636 tonnes. But it quickly emerged that there was little real shortage of food in the country as a whole. According to the US Agency for International Development (USAID): ‘The staple crops did not sustain as

much damage as the cash crops because the former are grown on higher ground. Because staple crops are relatively undamaged, there is an ample supply of local food in the market." The problem, until the roads were repaired, was one not of supply but of food storage and distribution. Indeed, argued Chris Bland of the UN Children's Fund (UNICEF), the food aid posed a danger of driving down local prices and so disrupting local markets.

Likewise the expected epidemics did not immediately materialize. There were small outbreaks in towns where sanitary conditions were worst. A month after the disaster, the Pan-American Health Organization (PAHO) reported some 2,700 cases of malaria in Nicaragua and 1,900 in Honduras; plus 1,400 suspected cases of cholera in Guatemala and 40 in Nicaragua; and 1,200 cases of dengue fever each in Honduras and Nicaragua. But there were only a handful of fatalities from these diseases or from leptospirosis (a fever carried by rats).

Longer-term concerns remained, however. On the food side, the greatest concern soon became future crops. The country had lost most of its seed stocks for future planting. The World Bank-funded Consultative Group on International Agricultural Research set up an emergency effort to get new seeds to small farmers in time for December planting.

And on the health side, with many sewage and water supply systems destroyed or in a bad state of repair, the risks remained. The PAHO says that "the big item" for health "is reconstruction of the water system."

There were, too, unexpected risks. The flood waters 'liberated' thousands of landmines left behind after the wars that hit the region in the 1980s. Before Mitch, the whereabouts of most of the minefields were known. Now they could be anywhere.

Emergency relief aid can be a mixed blessing. It can save lives, but can swiftly generate dependency. Bland at UNICEF said six weeks after Mitch: "We must bring the emergency to an end as soon as possible, get people out of the shelters and back rebuilding their lives."

Box 3.2 Choluteca: "Hurricanes never come here"

Standing on the edge of the River Choluteca in the town of the same name, I watched refugee women wash their clothes in the flow. A man approached me with a map. He pointed to the spot where we were standing. It was 50 metres, or two blocks, from the former edge of the river. The river had simply washed everything away and taken a new, seemingly permanent, path. Behind us was more destruction, stretching two more blocks back from the river before there were habitable houses, and for a couple of kilometres or more upstream towards a Japanese-funded suspension bridge that survived the flood.

The women said that the entire Pedro Dias *colonia* had been washed away, and most of the Buenos Aires *colonia* too. More than a hundred people died, despite a functioning evacuation system. Nobody had believed the flood warnings when they came. "Hurricanes never come here," said Lidia Rosa Paz bleakly.

Walking over the dried-out mud of the new river bank, I found I was walking on the roofs of houses that had been entirely engulfed by mud brought down by the floods from the deforested hills above. As it dries, this silt has begun to blow. The entire town was hit by dust

storms as winds whipped up the silt, and in a scene similar to a spreading desert, dunes are forming where once there were houses. Dotted across the landscape were empty metal containers of the kind put on large trucks. They had been washed hundreds of yards from a container park and had crashed into buildings and been wrapped round trees.

Above the river's high water mark, several hundred metres away, some 400 people from 83 families sheltered in an eight-room school. This was just one of dozens of refugee centres in the city and the surrounding area, housing thousands of people. Their only source of water was a single tap draining a large water bag placed on the school porch by an aid agency.

In contrast with the people of Pespire, these people seem lethargic and reluctant to take charge of their destiny. Nobody was rebuilding. Youths slept in hammocks through the afternoon. Back on the river, two men were steering an ox-drawn cart through the waist-high water. They were dredging wet silt into a tub and hauling it ashore – to make mud bricks for building. But they said they were working for a distant entrepreneur, not the local community.

He saw, even then, the emergence of a dependency culture. Refugees in Choluteca lay in their hammocks in relief shelters just yards from their former homes, awaiting efforts by others to rebuild their lives.

"People who don't need it are going to the shelters to get food," he said. "The shelters are undermining the social pattern of self-help." And the shelters were coming under political patronage. Politicians, religious leaders and others were adopting shelters and lobbying to get extra assistance for 'their' shelters.

Nonetheless, many visitors to Honduras after Mitch remarked on the willingness of stricken communities to help themselves. DFID's initial report spoke of the "striking feature [of the] self-help of communities themselves. Most lives were saved and vulnerable people helped by indigenous efforts," it said, adding that "the strength of local government was a key factor." By contrast, DFID painted a less flattering portrait of international relief agencies: "The UN could have been more assertive in terms of providing guidance...and donors more conscientious – and less competitive – in deferring to UN coordination."

Within days of the hurricane, people all over Honduras were excavating the mud from their old homes or just starting again, building amid the mud and debris of landslips. In Tegucigalpa, teams of students and young people wielded spades and picks to clear mounds of silt and debris from riverside streets. Within a week of the *colonia* of Miramesi being washed away, the former residents were discussing setting up a business enterprise to raise money to build a new Miramesi somewhere else. Well-developed communities, such as the town of Pespire, were alive with people rebuilding.

Self-helpers were not aided by apparent confusion within government. Word went out that the government had given the order not to repair buildings close to the river. But many individual communities said local officials had told them they were allowed to rebuild their homes by the rivers if they wished.

Learning from mistakes

At the municipal level, there are high hopes that city authorities can learn from past mistakes, without breaking the bank. The UNDP noted in a report immediately after Mitch that "casualties [in Honduras] were lower in areas where early warning systems and community organization for disaster response has been established." This was most notable in northern towns that had been hit hard by Hurricane Fifi in 1974, which killed some 5,000 Hondurans.

San Pedro Sula had responded to Fifi by banning new building in flood-prone areas, and by reforesting hillsides, maintaining drainage channels and strengthening bridges. But the city fathers knew this might not be enough. When Mitch hit, they had an evacuation plan with 250 designated shelters ready to receive 60,000 people from known high-risk areas. Similarly, after a hurricane in 1992, Marlon Lara, the mayor of the coastal town of Puerto Cortes, put in storm drains and kept them maintained. Result: no deaths this time.

In La Ceiba, many citizens were saved by prompt evacuation systems organized by the local Red Cross. "We had the experience of Hurricane Fifi in 1974 to draw on," said Atlántida branch vice-president Rosario Arias. "We got 10,000 out before Mitch struck, and that's why only nine people lost their lives here."

Steve Maber at the World Bank said a radio network set up for a health information campaign in remote villages was successfully used during Mitch to warn remote villages about coming floods and landslides. "In some of the villages people were saved by it," he said, notably the village of Orlancho in the Mosquito department where there are no phones.

Better mapping could be a key to better hazard avoidance and protection. In the weeks after the disaster, the USGS began a detailed mapping exercise that, it claimed, could help predict future landslips, design bridges that would not be washed away in floods and so on. It could also help identify areas for flood diversion upstream of cities, an idea proposed by Maber.

The politics of reconstruction

The Honduran government has drawn up a national emergency strategy to minimize the impact of future hurricanes. This follows the work of the USGS and a report from the World Bank's team under Maber. Expertise for the project will come with a US\$ 625 million aid package from the World Bank. It is based on a similar Bank-inspired strategy for the Bahamas, and focuses on improving communications and warning systems, as well as strengthening infrastructure. "The next step is to define the size of the project, but it will probably involve building flood defence walls, gabion walls and flood attenuation [diversion] ponds," says Maber.

The politics of reconstruction are likely to play a major role in national politics, and in the country's relations with the international community, for many years to come. The UNDP

Box 3.3 Immediate humanitarian imperatives

From the start, relief workers knew Hurricane Mitch was the big one. The sheer scale of rainfall, flooding, landslides and geographical coverage of the destruction were unprecedented. Millions of people could be threatened.

In all emergency operations, high-risk decisions must be taken early on, often based on unverifiable government estimates. Facts change wildly from day to day. Search and rescue, medical relief, food aid, shelter and rehabilitation issues all had to be assessed and prioritized almost simultaneously. In a disaster the size of Mitch, the implications of a wrong decision or no decision were equally huge.

Initial life-saving evacuations were undertaken by local people and relief teams. Local branches of the Red Cross worked with civilians and the army to find and move the worst-affected people into temporary shelters. Military and local authorities reopened roads and temporarily restored river crossings.

A major threat in the first few weeks was from the rapid spread of infectious diseases. After the initial inundation and risk of drowning, most floods kill through lack of clean water. Cholera can quickly spread through contaminated water. And the floods left behind vast tracts of stagnant water – ideal breeding grounds for the mosquitoes which spread malaria and dengue fever. Agencies worked to limit possible epidemics by providing clean water, drug kits to deal with cholera, and spraying equipment to attack mosquitoes. No major epidemics broke out. Maybe preventive action was pivotal in this, maybe luck played a role.

First reports and assessments confirmed the floods had devastated food crops, especially banana and coffee plantations, as well as shattering distribution networks. With food in short supply, prices would rise. Tens of thousands had lost their jobs and incomes overnight as businesses were washed away. Unable to grow their own staples, they would be forced to buy

food at inflated prices. The next harvest was in May – six months after the disaster. Aid agencies were worried that those hit hardest by the hurricane, faced with rebuilding homes and livelihoods, would face real problems getting enough to eat. Famine was not looming, but an acute food security crisis threatened those least able to cope.

Quick action was needed. Food-aid supply systems were set up to provide, in effect, a subsidy to the most vulnerable. Where possible, food was bought locally. But in the hardest hit areas there was no food to buy, so it was imported from the nearest sources – Panama and Costa Rica.

Was the diagnosis wrong? Some have argued that millions of dollars were wasted on unnecessary food aid which only undermined local markets. After all, it was the cash crops like bananas which were far worse hit than the staples. But in a disaster such as Mitch, food costs will always soar as stocks become scarce. Food aid may not so much undermine local markets as stabilize food prices at pre-disaster levels and subsidize staples for the hardest hit – more important than ensuring the profits of a few opportunistic local traders.

In the past few years the term 'complex emergency' has come to mean conflict and starvation. But, as Mitch shows, every large disaster is complex. Risks are high and relief agencies must make quick decisions in order to save lives. Emergency relief is not about weighing up short-term needs against possible long-term effects.

This sort of conditionality, whether founded in economics or concern for human rights, is anathema to the creed of humanitarianism. A doctor treats a gun-shot wound whether the victim is a mass murderer or a policeman – and if the patient later goes out and kills someone, that does not invalidate the doctor's decision to save his or her life. So too, humanitarians alleviate acute suffering urgently and immediately, unconstrained by the potential 'what-ifs' of an uncertain future.

said immediately after the disaster that “reconstruction should support more just and sustainable development in which reduction of exposure to the effects of natural disasters is taken into account”. It warned against perpetuating the “vicious circle of population growth, environmental degradation and poverty”.

But some say reconstruction has got off on the wrong foot, with a drive towards large ‘technical fixes’ rather than socially- and environmentally-responsive programmes. There are also fears that it could be crippled by corruption. Mario Gutierrez, proprietor of the English-language weekly newspaper *Honduras This Week*, used his column after Mitch to attack corrupt construction companies. He noted how old stone-built bridges in the capital had survived Mitch, whereas newer concrete and steel structures built by construction companies had been felled. His concern was heightened by a government announcement that normal rules of competitive bidding for public works contracts were to be suspended during reconstruction.

However, UNICEF’s Chris Bland, who has lived and worked in Honduras for 20 years, is less worried about the setback to the country’s physical development. “What I fear most is not the physical loss of infrastructure, but the loss of 20 years of cerebral development,” he said. “We have worked hard here to develop community-based development, giving priority to small-scale and rural projects, concentrating on helping the poor. That is the path to sustainable development.” But he feared that in the aftermath of Mitch such considerations were being seen as an unnecessary luxury. Engineers and technocrats were again riding roughshod. “Social issues are going on the back-burner,” he said. “Issues of sustainability are being ignored.” Rural water-supply projects would lose out to big civil engineering schemes to build city sewers. The result would be a new burst of migrants from villages to the cities; more shanty towns on river banks and unstable hillsides – primed for the next disaster.

Bland identified a major problem present wherever relief and development cultures clash. In an emergency situation, both host governments and relief agencies need to employ clear command and control structures to respond in the swiftest and most effective way. Once disasters like Mitch strike and people are close to death or far from help, it is not the time to form committees and ponder options.

When the emergency services in wealthier countries arrive on the scene of a car-crash or fire, they act quickly and instinctively, since the situation usually requires technical rather than policy-level decisions. Nor do they hang around for long. The challenge for aid agencies is to know when to leave, or when to switch from the ‘top-down’ emergency mind-set to the longer-term ‘bottom-up’ developmental perspective needed for rehabilitation and recovery.

This period of transition, from emergency to recovery, starts before the mud has even dried. “The foundations for recovery are laid at the time of the disaster,” says John Rogge of UNDP’s Disaster Management Team, “but who is responsible for transitional activities?” The UN’s Disaster Assessment and Coordination teams (UNDAC) which jet into disaster zones around the world have only a three-week emergency mandate and then leave a vacuum behind them.

But if recovery begins immediately, then rehabilitation and recovery needs must be assessed simultaneously with the relief operation: “Should we be giving them tents or nails and hammers?” as Rogge puts it. Since rehabilitation can be threatened by ‘top-down’ priorities, it is the role of non-governmental organizations, national Red Cross societies and local civil society to team up with the big international financial institutions now funding recovery in order to ensure that rehabilitation benefits communities at every level. And to get beyond ‘infrastructure wish-lists’ to address the man-made mistakes which turned Mitch from natural disaster into human tragedy.

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