Risk Analysis, Vol. 20, No. 6, 2000

Societal Response to Hurricane Mitch and Intra- versus Intergenerational Equity Issues: Whose Norms Should Apply?

Michael Glantz[1]* and Dale Jamieson[2]

Late in the 1998 hurricane season, Central America was slammed by a devastating hurricane. Honduras, Nicaragua, El Salvador, Guatemala, and Belize were greatly impacted by Hurricane Mitch, one of the deadliest storms to affect the region in the past 200 years. The economies of each of these countries were badly affected. In the case of Honduras—at the time the fourth-poorest country in Latin America—its president suggested that 50 years of progress had been wiped out by the floods and mudslides associated with this relatively short-lived storm system. Humanitarian assistance poured into the region in the first months following the disaster. As of mid-2000, various national, bilateral, international, and nongovernmental programs were in progress or on the drawing board for recovery, reconstruction, and renewed development of the worst affected countries. Using Honduras as a case study, some of the ethical issues that abound in the decisions of whom to help, when, and how to help them in the wake of such an extreme climate-related human tragedy are examined. Should development assistance be focused on those who have been directly and adversely affected by this storm, or should the emphasis be on reducing the risk of exposure by future generations to such disasters? Is there yet another approach that seeks to protect future generations from similar harm while at the same time assisting present-day victims to get through their hardships?

KEY WORDS: Hurricane Mitch; intergenerational equity; disaster relief; sustainable development; precautionary principle

INTRODUCTION

The devastation wrought by Hurricane Mitch should serve as a catalyst for governments in the region and the donor community to consider how best to design, implement, and integrate development and disaster relief strategies. Before being able to do so, however, certain fundamental ethical questions have to be answered. Should development assistance be focused on those who have been directly and adversely affected by the storm, or is a different focus called for to reduce the risk of exposure of future generations to such disasters? Is there yet another approach that seeks to protect future generations from similar harm, while at the same time assisting present-day victims to get through their hardships? These are the type of questions in need of answers after events of such magnitude, but frequently do not receive the attention they deserve.[1]

Using Honduras as a case study, some of these ethical issues that abound in the decisions of whom, when, and how to help are discussed. Only 25 years earlier, almost to the month, Hurricane Fifi, a hurricane of much less intensity, caused a similar level of devastation in a less-populated Honduras. The question, then as now, is one of how to help existing generations get through the socioeconomic disruptions

[1] National Center for Atmospheric Research, Boulder, CO.
[2] Carleton College, Northfield, MN.
*Address correspondence to Michael Glantz, National Center for Atmospheric Research, P.O. Box 3000, Boulder, CO 80307-3000; glantz@ucar.edu.

0272-4332/00/1200-0869$16.00/1

caused by storms such as these while at the same time reducing the risks of similar destructive extreme events that future generations are likely to face.

These issues are discussed within the context of the conflicts between intra- and intergenerational issues, giving a brief presentation about the situation in Honduras before the onset of Hurricane Mitch and a comparison of some of the causes and effects of Hurricanes Mitch (1998) and Fifi (1974), both of which had major impacts in Honduras. Reconstruction required as a result of the damage that resulted from Mitch is briefly reviewed and the notion of "leapfrog development" is raised, followed by a discussion of persistent global inequities. The following section then focuses on inter- and intragenerational equity issues by juxtaposing what ought to be a response to Mitch (a normative view) as opposed to what has been the apparent response. The issue presented by philosophers relates to whether the present generations have any responsibility for the welfare of future generations. An issue that permeates the discussion is brought up—that of risk. In addition to the traditional categories of risk aversion and risk taking, another category is discussed—that of the risk maker. Some of the key present-day obstacles to addressing generational issues and reducing the risks faced by future generations are noted, followed by concluding comments on what might be needed to overcome those obstacles.

INTERGENERATIONAL VERSUS INTRAGENERATIONAL CONSIDERATIONS

Intergenerational concerns over resource use have most likely been in conflict with intragenerational concerns forever. The conflict appears in the form of decisions related primarily to who benefits and when. For example, should nonrenewable resources such as tropical rainforests be harvested today or should they be preserved for future generations to decide how (or whether) to use them? The same question can be asked about other natural resources, such as fish populations, soils, and water resources, as well as about air quality—which is affected by the production and consumption of "useful" chemicals that also pollute the atmosphere, deplete the ozone layer, or both.

The very concept of "a generation" is not in itself entirely clear. In 1927, the German sociologist Karl Mannheim distinguished between a cohort and a generation,[2] defining a *cohort* as a group of people born during a particular chronological period, and a *generation* as a cohort that has some shared consciousness created by a common historical experience. This is an interesting distinction, but for the issue at hand a generation will be defined as a cohort born within a 20-year period. It follows from this definition that several generations may be alive at any given point in time—a 15-year-old, a 35-year-old, a 55-year-old, and a 75-year-old. This definition suggests that it is possible for the generations in power today (say, the 35–55-year-olds) to hold conversations with those who represent future generations, that is, those people in the generation centered around the 15-year-olds. In other words, a dialogue can take place among at least four coexisting generations. Thirty years from now, those who are 15 will be in their mid-40s and will likely be in charge of many sectors of society and government. As a result of present-day intergenerational discussion, political leaders can observe—if they have the will to do so—the desires of those who will make up the future generation of leaders, and, therefore have a chance to influence their decision-making processes.

Conflicts over inter- and intragenerational issues also exist within and between national and international organizations. For example, the U.S. foreign aid community and the various national agencies within it are subdivided into numerous bureaucratic components, each with its own jurisdiction and mission. There are bureaucratic units within the U.S. Agency for International Development (AID) that focus on either long-term sustainable development issues or short-term foreign disaster assistance. Their respective missions can come into direct conflict.[1] With any given natural disaster, there is usually, but not always—the February 2000 floods in Mozambique being a case in point—an immediate response by donor countries and the international humanitarian aid community to provide timely emergency assistance to those who are immediately and directly affected.

Those responsible for providing immediate ad hoc disaster assistance are trained to focus on and deal with short-term problems in need of quick, often makeshift (and therefore temporary), solutions. By necessity, they attend to the food, shelter, and health needs of the injured and the survivors. Because they are on the front line in the battle to mitigate the disaster's impacts, they are forced to apply, if not explicitly then implicitly, the notion of triage to the disaster's victims; that is, they divide the victims into groups depending on the severity of their injuries. They are then forced to choose those victims whom they think are likely to survive if given immediate assistance. They do not have the luxury of time to worry about

sustainable development issues, nor do they have the plentiful resources that would be required to attend to all victims. Economic development schemes or concerns about arresting or reversing deforestation, desertification, or soil erosion, go onto the back burner.

For their part, economic development specialists focus on issues related to long-term sustainable economic development in a region that is occasionally affected in adverse ways by natural disasters. The humanitarian aid required for disaster response is often needed only in the short term, although it may be relatively high in value. The assistance required to pursue economic development strategies, however, involves sustained, long-term moral as well as financial commitments from the donor community. Because the disaster assistance community is primarily concerned about human needs in the present, as opposed to policies representing the concerns of future generations, their activities are frequently in conflict with those of the long-term development community. Berke and Beatley noted that "Emergency relief organizations do not address the underlying problem of disaster vulnerability in poor countries . . . .? Development agencies do not account for hazards in project investment decisions" (p. 17).[1] Indeed, it is not only concerns about intergenerational equity that are placed on the back burner, but so are concerns about intragenerational equity.

Just about every natural disaster stimulates sympathy, if not responses with material assistance, from governments and humanitarian nongovernmental organizations (NGOs). Expressions of sympathy as well as humanitarian responses can even come from traditional enemies when one of them has been devastated, for example, by an earthquake, hurricane, or drought. That sympathy and attention usually does not last very long, however, as new, equally devastating disasters occur elsewhere on the globe. Figure 1 identifies the location and timing of various climate and climate-related anomalies that occurred during 1999, which happened to be an entire calendar year encompassed by a La Niña event that began in mid-1998 and extended well into 2000. Several of these climate anomalies contributed to, if not created, natural disasters that required humanitarian responses from the international community.

The most recent disaster to occur diverts attention away from "older" disasters and disrupts and diverts the flow of sorely needed international resources to other locations also in need of emergency help. Emergency humanitarian assistance is costly, especially when those costs are totalled across the globe for all natural disasters in a given year. Yet, unfortunately, for just about any natural disaster, the humanitarian response from donors in terms of financial assistance is almost always just a fraction of what is needed. The burden of recovery falls on the country

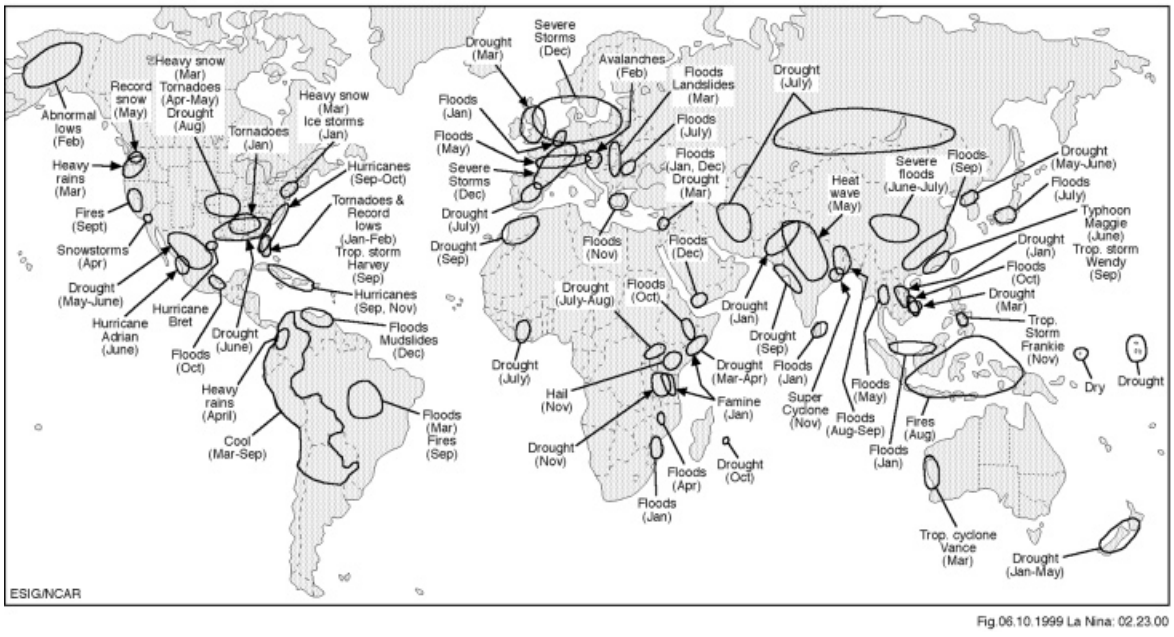

Fig. 1. Anomalies in 1999: A La Niña year.

suffering from the disaster's impacts. Making matters worse, human suffering (i.e., displacement, illness, lost productivity, loss of personal property) is seldom put into quantitative (monetary) terms as a cost factor that accompanies such disasters. The need for assistance in the postdisaster recovery phase is many times greater than for the emergency phase itself.

A case study focused on a particular disaster can yield insights about the effects of practical responses of governments and humanitarian NGOs during the recovery and reconstruction phases. The analysis can also shed light on the subtle and not-so-subtle interplay between consideration of intragenerational and intergenerational equity issues. It can also help to put a human face, an identity, on proverbial climate-impact-related "winners" and "losers."[3]

Selecting a disaster in order to evaluate generational issues is a difficult task. There are many criteria that could be used to choose examples: a disaster in a developing country or an industrialized one; in a country in transition in Eastern Europe or the former Soviet Union; a human-caused or a natural disaster. Opting to select a recent disaster reduces the list of potential candidates considerably: an earthquake in Colombia, Hurricane Georges or Hurricane Mitch in the Caribbean Sea, drought and famine in Papua New Guinea, forest fires in Indonesia, or floods and mudslides in Venezuela or China. Each of these disasters could serve as a good case study to address generational equity issues. The one chosen is Hurricane Mitch.

Worldwide media coverage of Hurricane Mitch and its impacts was swift, plentiful, and constant. Emergency responses to Mitch's disaster victims from governmental and nongovernmental international humanitarian communities were relatively rapid. Although a few years have passed since the disaster, workshops and meetings on Central America tend to talk about development in the region in terms of pre-Mitch and post-Mitch phases. Of the countries in Mitch's path—Belize, El Salvador, Guatemala, Honduras, and Nicaragua—Honduras was the worst affected, followed by Nicaragua. In response to the destruction, the stated goal of the international donor community was to focus on "the reconstruction *and* transformation" of Central America. The Inter-American Development Bank (IDB) organized a meeting of high-ranking political leaders and donors from governments and international agencies to discuss the resources that, according to the affected countries, would be needed for their recovery and future development. In the report of this Consultative Group Meeting for the Reconstruction and Transformation of Central America, held in Stockholm, Sweden, from 25–28 May 1999, the donors (countries and development banks) noted the following:

> It was clear from our deliberations at this meeting that regional cooperation and integration, which continue to be basic pillars for the development of the Region, now have fundamental opportunities and challenges for implementation, in light of the reconstruction and transformation taking place in the Region. (p. 4)[4]

THE HONDURAS SETTING

Honduras is the second-largest country in Central America. It encompasses 47,000 square miles, about the size of the state of Louisiana. Its population is estimated at 6 million, mostly rural, with an annual growth rate of 2.8%. About a third of the workforce is in the agricultural and natural resources sector. Almost 40% is in the manufacturing sector, but industrial growth has been slow. Its exports amount to a few billion dollars and include coffee, bananas, citrus fruit, shrimp, beef, timber, and textile products.[5] The levels of unemployment, illiteracy, poverty, landlessness, and disease put Honduras only slightly above Haiti in terms of regional development. In 1993 it was believed that up to 80% of the population lived in poverty and that unemployment was at least 40% of those of working age.[6]

Although it was one of the poorest countries in Latin America before Hurricane Mitch, Honduras was apparently making progress in development. According to the United Nations Development Program (UNDP) *Human Development Report 1998*,[7] Honduras is one of the countries in which life expectancy had increased the most over the last generation, rising from 53 years in 1970 to 69 years in 1995. The Human Development Index, a construct developed by the UNDP that incorporates longevity, educational attainment, and adjusted real gross domestic product (GDP), had more than doubled in Honduras from 1960 to 1995. Not all reports, however, agree with this perception of improvement. For example, in a 1999 International Monetary Fund policy discussion paper entitled "Honduras's Growth Performance During 1970–97," the author's analysis was that "for the period 1970–97, the average growth rate in real per capita GDP was almost zero" (p. 1).[8] Since 1980, before Hurricane Mitch decimated the country, per capita GDP had been declining at a time when conditions in less-developed countries not racked by war were improving faster than in Honduras. It is also

sobering to note that in 1995, a few years before Hurricane Mitch, more than half the population lived below the poverty line and nearly a third did not have access to basic health care.[7]

With regard to domestic politics, Honduras has endured a great deal of political change. Perhaps this situation is best captured by the statement of an incoming president, who noted in his 1982 inaugural address "... the Honduran record of 16 constitutions, 126 governments, and 385 armed rebellions in 161 years of independence" (p. 396).[6]

Hurricanes and Honduras

Today, storms and hurricanes in the tropical Atlantic are monitored from space, from aircraft, and on the ground. They are traced hour by hour and day by day, from when they are considered to be a remote but increasingly potential threat until they have no potential impact. Like many other tropical storms of such magnitude, Hurricane Mitch was well observed from infancy to its demise.

After Hurricane Mitch crossed the Caribbean Sea westward in late October 1998, it hovered for a few days at the coast and then moved inland. It did most of its damage in Honduras after it had already been downgraded from its Level 5 hurricane status to a tropical storm, and was then further downgraded to a tropical depression. It then regained strength as the depression shifted eastward across the Gulf of Mexico and made landfall in Florida. Figure 2 depicts the path of Hurricane Mitch from 22 October to 5 November 1998.

Many people stated that Honduras was devastated by Hurricane Mitch, but the word "devastated" does not really convey the depth and breadth of its adverse impacts. About one-third of Honduras's total population of 6 million was negatively affected. The death toll in Honduras was estimated at 10,000 (17,000, if the missing are included), and the damage to Honduras's infrastructure was estimated at the time to be 90% of the country's total.[9] Ninety percent of its roads suffered some degree of destruction. Banana plantations, one of the mainstays of the Honduran economy and a source of one its key export crops, were destroyed—at first by the winds and floods and later by standing and contaminated water in the fields.[10] In the aftermath of the hurricane, adverse human health effects such as cholera, dysentery, malaria, and dengue fever were expected to sharply increase but luckily did not do so. Honduras could ill afford such additional devastation. Accord-

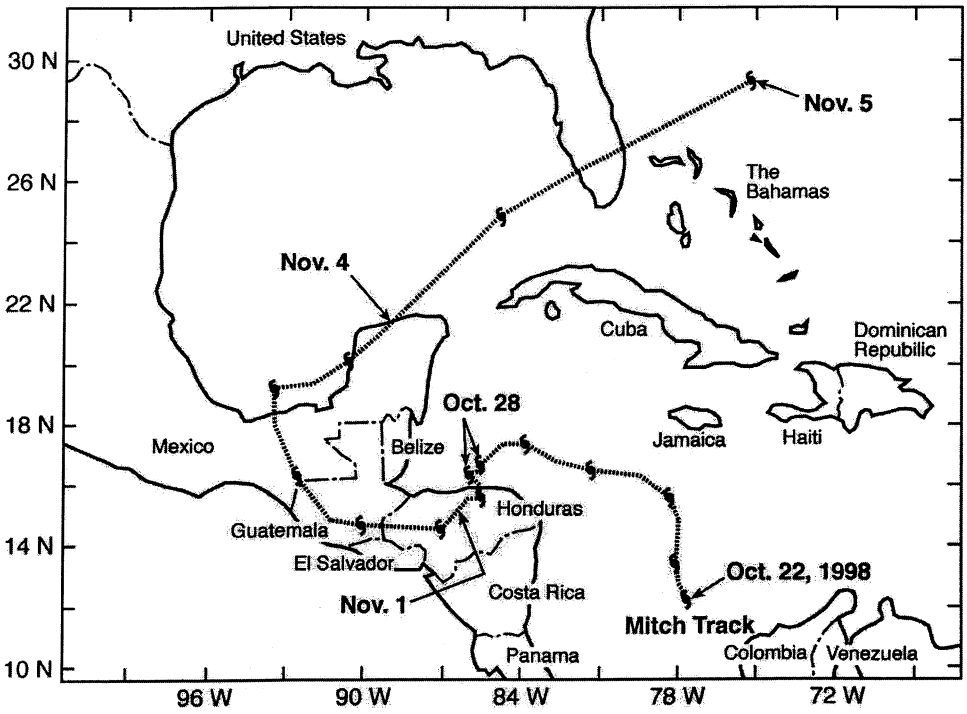

Fig. 2. Observed track of Hurricane Mitch.

ing to President Carlos Flores Facusse, Hurricane Mitch had set back economic development of the country by 50 years.

Emergency aid was sent to the country for a relatively short period of time. This was followed by assistance to rebuild the damaged infrastructure in order to get the flow of goods and human services back to a semblance of "normalcy." In this instance, because of the high level of destruction, a portion of the international debts owed by Honduras and Nicaragua to foreign countries and banks was forgiven.[11] Clearly, there was no way these countries could have been able to repay their debt, even under normal, that is, pre-Mitch, conditions. With many of the natural resources and manufacturing capabilities destroyed, these countries could not be expected to generate on their own the funding needed to rebuild. The emergency aid was stopgap in nature, and was considerably less than needed in order to restore these countries even to their pre–Hurricane Mitch level of development. In fact, the assistance that did arrive proved to be considerably less than what had been pledged by potential donors during the height of the emergency.[12]

It is important to remind aid and disaster specialists, researchers, and government officials that 25 years before Mitch, on 18 September 1974, Hurricane Fifi struck Honduras and caused at least 8,000 deaths and about a billion dollars (1974 dollars) of destruction in Honduras alone.[13] Because the Honduran government was unable at the time to respond to the crisis in a timely way, it had to rely primarily on international assistance. The destruction of the transportation infrastructure made emergency access by donors to the victims very difficult. Bridges and railway tracks had been swept away, roads were buried in mud, and at first, helicopters from the U.S. base in the Panama Canal Zone were the only means of rescue. In addition to the death and destruction there was a sharp increase in health problems such as cholera and dysentery. Hundreds of thousands of people in the affected areas were left homeless and in need of assistance.[14]

The destruction during Fifi was exacerbated in large measure because of the social, economic, and political conditions at the time. On this aspect Diaz and Pulwarty[15] wrote—based on Susman, O'Keefe, and Wisner[16]—that

> the most important factor in the destruction caused by Hurricane Fifi was the deforestation beginning in earnest in the mid-1960s. . . . United States-owned banana companies extensively developed the rich fertile valleys in northern Honduras around the San Pedro de Sula Valley and increasingly cleared forests for banana plantations. Land on the valley bottoms were either owned by banana companies . . . or used for large-scale irrigation, resulting in subsistence and extractive living on hill slopes. Campesinos moved to this cheaper land where forest was cleared to grow maize, increasing soil erosion and siltation of rivers. . . . In Honduras, where 63% of the farmers had access to only 6% of the arable land, large-scale beef ranches and banana plantations had displaced peasants over several decades into isolated valleys and steep hillsides. (p. 195)[15]

Other factors that contributed to making a bad situation much worse with regard to the level of impacts of Hurricane Fifi included corruption—much of the food and medical supplies did not go to those in need but, instead, was diverted to the black market—government inability to organize an effective disaster response, and the fact that Honduras was then *the* poorest county in Central America.[12] At that time no effective early warning system existed that could have provided an alert to the populations at risk, because of poor communication infrastructure in the country. Figure 3 provides a comparison on the impacts of Hurricanes Mitch and Fifi.

It is interesting to note that the donors' summary comments made at the 1999 consultative meeting included the following observation; "Central America's tragedy was magnified by man-made decisions due to poverty that led to chaotic urbanization, massive deforestation and soil degradation."[4] The report also noted that the IDB president had emphasized that Hurricane Mitch

> provided important lessons and that we should avoid repeating the same mistakes. The vicious cycle of poverty and ecological degradation needs to be broken. Hurricane Mitch clearly demonstrated the extreme vulnerability of the poorest segments of the population who suffered the most from Mitch's devastation. At the same time, the poor, in cultivating steep hillsides and living in flood plains, contributed to the severity of flooding and mudslides.[4]

These are similar to the lessons that had been identified 25 years earlier—in the aftermath of Hurricane Fifi in 1974. Some of the issues of concern that had been identified in the wake of Hurricane Fifi went unaddressed in the two-and-a-half decades that separated Mitch and Fifi, although at least one lesson was learned from Fifi. In the mid-1970s, it was recommended that the mountainous areas surrounding San Pedro Sula and Choloma be turned into reserves. This meant that tree cutting, forest burning, and construction were off-limits in order to avoid future devastation as a result of land and mudslides (Judy Canahuati, Escuela Internacional Samprana, personal

	Aid Pledged (from U.S.)	Est. Damage to Hond. ($)	Death Toll	Homeless	Areas Most Impacted	% Infrastr. lost	# Years Setback	Reconstr. Costs
FIFI 1974	$52m	$450m - $1b	5,000 - 10,000	300,000 - 600,000	Choloma; La Ceiba	?	2	?
MITCH 1998	$42.4m	$2b - $4b	6,500	1 million - 2 million	Sula Valley, Roatan, La Ceiba, Teguc., Tocoa, Utila	90%	50	$10b

	% Agricult Lost	Exports Losses ($)	Major Export Crops	Agricult. ? % of GDP	% of Bananas Destroyed	Bananas % of Exports	Economic Sectors
FIFI 1974	50%	$79m	Bananas	?	75%	33% - 50%	?
MITCH 1998	70% - 80%	$900m	Coffee, bananas, shellfish	30%	90%	20%	#1- Agric; #2- Manufact.

Fig. 3. Hurricanes Mitch/Fifi comparison.

communication, 18 June 2000). One must wonder if changes in development policy following Fifi might have lessened in any way the devastation wrought by Mitch, had they been fully implemented in the following 25 years.

POST-MITCH RECONSTRUCTION AND LEAPFROG DEVELOPMENT

The initial tendency in the aftermath of Hurricane Mitch has been to rebuild Honduras back to what it was before the storm. But what was Honduras like pre–Hurricane Mitch? It was the fourth-poorest country in Latin America. Obvious questions then arise: Is there a way to rebuild the country so that it is no longer the fourth-poorest country in the Western Hemisphere? Can the various intragenerational inequities—land tenure inequities, widespread poverty, corruption, poor environmental management, high debt servicing—that made Hondurans so vulnerable to the disaster be addressed? Is there a way to enhance its prospects for *truly* long-term sustainable development during the post-Mitch reconstruction phase? Can Honduras somehow be converted from a poor developing country to a more prosperous one, and with a higher level of resilience to cope with natural hazard impacts? A more prosperous country is, in fact, a goal that had been noted long before Hurricane Mitch by Honduran political leaders, World Bank officials, and economic development specialists.

The present period can be viewed as a unique point in Honduran history and in the history of foreign

humanitarian assistance—with Honduras's infrastructure and economy in relative disarray, some radical thinking is warranted. One such radical approach would be for *all* Hondurans to design the society they would like to create and for the international community to combine forces to find ways to help Hondurans achieve it. Nicaraguan political leader Carlos Chamorro commented on this choice facing Hondurans and the international community: "Should we aim over the next decades to return to a situation similar to 1998?" He then asked, "Why not take advantage of the crisis to revise a development strategy that was not working well anyway?"[17] The IDB consultative group's Summary Report reinforced the concern expressed in his view, noting that "the Central American leaders once again emphasized that the tragedy of Hurricane Mitch provided a unique opportunity to rebuild, not the same, but a better Central America" (p. 2).[4]

A new wave of development assistance can be expected in the wake of Hurricane Mitch, though perhaps not on the scale that might be expected as a result of the explicit statements of various politicians in both donor and recipient countries. The questions are whether this assistance is adequate and whether it will be used to ameliorate only present problems or if it will be used to create a whole new level of economic and social development capable of averting similar problems in the face of future natural hazards.

The financial commitments from the international community for reconstructing and transforming the region were on the order of $9 billion for all of the affected countries and Costa Rica, which was indirectly affected by having to receive many thousands of migrants—refugees from Mitch—from its neighbors, especially Nicaragua. Much of that funding was not new money but funding that had been redirected from existing development programs and debt forgiveness. Donor reluctance is yet another concern related to disaster funding. Donors have called for reforms within these recipient countries, for example, transparency in the use of donor and public funds. At the same time they also raise a concern about the lack of absorptive capacity, that is, the lack of human capacity within the country to use large amounts of aid effectively, whether or not that concern is valid.

Comprehensive reconstruction activities require sustained funding as well as sustained interest from external sources, and a long time to be completed. The likely scenario, however, is that the worst affected country (in this case, Honduras) will be restored, maybe, to the level of development it had reached before the impacts of Hurricane Mitch. In other words, Honduras would likely be returned to its previous levels of economic development and public health, a return to the levels of poverty, dependence on a few agricultural exports, and so forth, that existed just before the blitz of Hurricane Mitch. Can such a dismal scenario—that of returning a poor country only to its previous level of poverty—be avoided?

Signs for such a radical departure from past responses to natural disasters are not promising. For example, a year after Hurricane Mitch, in late October 1999, the United Nations World Food Program had to appeal once again to donors to "make good on their pledges to help Central America recover from Hurricane Mitch," noting that only a third of the $72 million pledged at the height of the emergency had been received.[12] It seems that the international community of donors was already exhibiting signs of losing interest, experiencing "donor fatigue" in post-Mitch Honduras, if not the rest of Central America—words to the contrary notwithstanding.

Yet, the industrialized countries should consider combining and coordinating their foreign assistance efforts to help a struggling Honduras—prone to recurrent natural hazards and disasters—to begin the twenty-first century on a self-sustaining economic development path. For the "rich" countries—the "haves"—to be willing (we know they are able) to rebuild a poor—"have-not"—country would provide hope to other developing countries, which have been struggling against all odds to close the large and ever expanding economic development gap between them and the industrialized nations. An economically developed Honduras would provide an economic, as well as a sustainable, development success story to the world, much in the way that the reconstruction of post–World War II Germany and Japan has done.

In the environmental and international assistance communities, the notion of "leapfrog" development has generated considerable interest. Leapfrog development refers to the idea that a developing country can bypass the conventional stages-of-development path and move directly into a future that protects the environment and benefits the poor. It is based on the realization that, if the poor countries have to pass through the various stages of development in the same sequence as the rich countries have done, then there will be major adverse impacts on regional and global climate, rainforests, biodiversity, water quality and quantity, and so forth. As a result, economic and environmentally sustainable development goals most likely will remain as wishful think-

ing. The sentiment behind leapfrog development existed at least a century ago. American anthropologist Elmer Service noted that "Several writers prior to Veblen and Trotsky, including Louis H. Morgan, had remarked on the tendency of backward societies to skip over whole generations of development by borrowing from the culture of advanced societies . . ." (p. 100).[18] By analogy, vulnerable societies can be made less so if they receive technologies as well as techniques from the industrialized (read donor) countries.

The 1998 UNDP report noted that

> They [the poor countries] can incorporate many of the available technologies that are not only less environmentally damaging but clean—solar energy, less energy-intensive crop production, cleaner paper production. . . . The cost saving will go beyond the direct costs of cleaning up old toxic sites, scrubbing coal power plants and so on. Health care costs linked to environmental damage can also be saved. And leapfrogging will bypass the lock-in that can result from inappropriate infrastructure development. (p. 7)[7]

A major objection to leapfrog development is that it could end up favoring future generations at the expense of present ones, because resources would likely be shifted away from addressing immediate survival needs to long-term investments in order to reduce vulnerability and increase future resilience. It is no doubt better to give a hungry man a fishing pole rather than a fish so that he can address his own needs. He must, however, survive long enough in the interim to be able to catch some fish.

When it comes to the present-day population of a relatively small, devastated country that currently has trouble meeting its own needs and obligations, the leaders of such a country have a problem in even considering the well-being of its citizens in the future. Honduras is, at present, heavily in debt and with limited resources of value to barter or trade its way into an economically better future. Like many other developing countries, Honduras is held hostage by the high cost of paying its interest, that is, servicing its foreign debts. By way of illustration, at the end of 1997 the Honduran public foreign debt was about $3.8 billion, and servicing that debt consumed more than 30% of the government's revenues.[5] This raises issues of intra- as well as intergenerational justice.

GLOBAL INEQUITIES

In order to better understand the problems involved in considering trade-offs between present and future generations, it is important to consider the range and extent of current global inequities. By most accounts global inequality among countries continues to increase, as the gap between the rich and the poor nations has continued to grow. Again quoting from the UNDP 1998 report, "In 1960 the 20% of the world's people who live in the richest countries had 30 times the income of the poorest 20%—by 1995 82 times as much income" (p. 29).[7] People in the rich countries consume 11 times as much meat, 7 times as much fish, 17 times as much energy, 77 times as much paper, and have 49 times as many telephone lines and 145 times as many cars.[8] UNDP data from 1997 indicates the 225 richest people in the world are from the rich countries—all but 2, who are from South Africa—and have a combined wealth that is equal to the annual income of the poorest 47% of the world's population. The wealth of the 15 richest people exceeds the total GDP of sub-Saharan Africa. Indeed, the assets of the 84 richest individuals are greater than the GDP of China (p. 30).[7]

There is no theory of justice in the Western tradition that would justify such inequalities. Despite this, very little is being done to effectively address these existing disparities in global wealth. International assistance has declined over the past two decades. The United States, which ranks 20th among the Organization for Economic Cooperation and Development (OECD) countries in international aid, gives only 0.1% of its GDP—less than half of what Italy, ranked 19th, provides at 0.2% of its GDP.[19] When this decline in international assistance is coupled with the tendency of globalization to concentrate wealth, the multiplier effect of capital-intensive new technologies and the stranglehold that debt servicing holds on the poor countries of the world will most likely mean that the twentieth century trend toward inequality among nations will continue well into the twenty-first.

Although ad hoc international disaster assistance, to some extent, helps to provide immediate humanitarian relief for emergencies, it usually does not address—and may even increase—the underlying structural problems that cause them. With declining international assistance and the increasing inequality among nations, it is more important than ever to develop and implement economic development strategies that will enable poor countries to pursue leapfrog development, and to do so in an environmentally friendly way. The tragedy of Hurricane Mitch in Honduras provides the international community with a chance to see whether this can be done.

JUSTICE: INTER- AND INTRAGENERATIONAL

From an ethical perspective, it is important to address the following two questions about generational equity: (1) how does society actually respond to the conflict between inter- and intragenerational issues and (2) how should society respond to this conflict?

How Does Society Actually Respond?

It is fairly obvious that, as individuals move beyond themselves, they tend to discount the interests, concerns, problems, and needs of others. The least discounting is probably applied to one's close relatives with whom one shares genes. The legendary evolutionary biologist J. B. S. Heldane was rumored to have once said in a pub conversation that he would happily die for three of his children or six of his grandchildren. This common sentiment can be explained by the biological theory of inclusive fitness: we share half of our genes with our children, a quarter with our grandchildren, and so on.[10]

Once individuals move beyond the boundaries of their own lineage, national boundaries and cultural differences lead to further discounting. The American government, for example, discounts the interests of Canadians, Russians, and the French, relative to those of its own citizens, despite the cultural similarities to these societies. Once individuals move beyond societies with many cultural similarities, the discount rate becomes even higher. An anecdote attributed to American newspaper owner William Randolph Hearst is instructive in this regard. When asked by a young reporter what he should cover during a first-time assignment in Europe, Hearst told him to write stories that involved 20 Chinese (who were in France at the time building railroads), 5 Europeans, or 1 American!

Time, too, is a boundary that leads people to discount the interests of others. Just as individuals or societies value more highly the interests of those who are close in space and culture than those who are remote, so the interests of those who are our contemporaries are considered more heavily than those who are far away in time. Thus, society tends to externalize harm into the future that could not be externalized on to its contemporaries.

Although rough generalizations can be made about how discount rates are ordered, they are dynamic, and probably not formally consistent, coherent, or transitive. Consider some apparent anomalies. Attention from the media (especially television) can turn a distant person into a near neighbor. Media attention focused on universal human stories during a disaster leads to Americans seeing Hondurans more as neighbors and less as foreigners, so their interests are discounted less than they had been either in the past or in the absence of a disaster. But once the media spotlight turns away from Honduras, or Americans hear some stories about corruption in that country, Hondurans once again are viewed in their usual status as distant "foreigners." As a result, a high discount rate is once again applied to them and their needs. This is part of the reason why Americans and others in the industrialized countries can be extremely generous for short periods of time when it comes to disaster relief, and then considerably less generous when it comes to providing long-term development aid to the same region.

One's perceptions about future generations, compared to those about present generations, are also quite unstable. On some issues individuals tend to prefer the interests of the future over those of the present. But in most situations society seems to highly discount the interests of future people. One apparent oddity is that the industrialized countries appear to favor discounting the interests of present-day foreigners at higher rates than the interests of future foreigners. Relatively speaking, more than half of the world's future people will live in developing countries; much of today's desired global environmental protection is aimed, wittingly or not, at protecting their interests. Perhaps a "deserving/undeserving" distinction is at play: Future foreigners *deserve* to have their interests taken more seriously since they are not here to defend themselves, that is, they are innocent as well as defenseless. Present-day foreigners deserve to have their interests discounted more heavily, however, because of their "bad" behavior, which is both visible and measurable.

How Should Society Respond?

Economists have typically argued that there is good reason for discounting the interests of future people. In a growing economy, N dollars now will be worth $N + m$ in the future, with the value of m increasing with time. So, if society does something that will cause a million dollars worth of damages in the future, only a portion of that needs to be set aside in the present. Another reason for discounting the interests of future people is that they are likely to be better off than people living today because of the savings

and productivity of present people. These considerations, when taken together, suggest that future generations should count for no more than present generations, and perhaps less, for practical reasons.

Philosophers going back to the nineteenth century have generally argued that there should be no discounting at all.[21] People who are distant in time or space are as real as those who live nearby and are alive now. Their interests, therefore, should be taken just as seriously. Thus, most philosophers who have considered these questions would assert that spatial and temporal boundaries are morally neutral.

John Rawls,[22] arguably the most influential political philosopher of the twentieth century, articulated a theory that can be seen as attempting to join the perspectives of both the economists and the philosophers. He agreed with the philosophers that "pure time preference" cannot be defended—equal benefits are of equal value whether they are obtained in the present or in the future. But like the economists, Rawls assumed that those who live in the future will generally be better off than those who live in the present. From this perspective, benefits bestowed by the present on the future are transfers from the poor to the rich. Although Rawls's discussion is brief, he appeared to be saying that those living in the present, for having caused destruction of the environment, may owe compensation to those living in the future. He also saw that, even if the global economies continue to grow, some people living in the future will be worse off than others living in the present. The main justification for concern about future people, according to Rawls, is concern for those in the future who will be below a "decent minimum."

Although he wrote well before the popularization of the term "sustainability," Rawls's concerns can be cast in that language. The fundamental duty of justice, according to Rawls, is to improve the status of those who are the worst off, whether they live in the present or the future. This can be viewed as an anticipation of Brundtland's formulation that sustainable development "meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43).[23] There are, however, many questions about sustainable development, not the least of which concerns what is to be sustained.[24] Those who promote the idea of "strong sustainability" argue that present-day society is destroying irreplaceable environmental resources such as species and ecosystems for which future people cannot be adequately compensated. On this view there are absolute limits on what present generations should be allowed to do, even in pursuit of a higher standard of living for the poorest among them. Ultimately, however, the idea of sustainable development will only begin to flower when present people see themselves as part of a community that is extended both in time as well as space.[25] Interestingly, this is an idea that can be found in the writings of the eighteenth-century Irish conservative, Edmund Burke.[26]

In this spirit it is sometimes suggested that immediate self-interest and a concern for those who are remote are mutually supportive. This argument supposes that Americans, for example, are better off when the poor in other countries are better off. Some of the reasons for this are economic; for example, it serves the interests of the North for Hondurans to become rich enough to buy products and services produced in the North and to invest in the economies of the North. Additionally, some developing countries have the ability to adversely impact the global environment—as a result, for example, of greenhouse gas emissions, tropical deforestation, and land-use practices—until they are developed enough to move away from a dependence on fossil fuels, or to protect rainforests instead of selling the trees to foreign companies for timber, and so forth. Despite this nice idea of "a rising tide lifts all boats," it seems clear that on many issues the interests of the North and South are in conflict. For example, if greenhouse gas emissions are to be stabilized or reduced, someone is going to have to bear the costs. Is this a case in which the "polluter pays" principle should or could apply? Still, there does seem to be a zone of mutual advantage.

These abstract and theoretical concerns would have to be realistically addressed in order to think in a systematic way about trade-offs between the interests of present and future people. Because Honduras is a relatively small country, it provides a good laboratory for such thinking. It can be held up as a model of how the "have" and "have not" countries can interact to make Honduras a graduated, self-sustaining economy. On the other hand, the notion of helping Honduras to leapfrog over some stages in the economic development process could be written off by the donor (i.e., industrialized or rich) countries, either as an unimportant, undesirable, or unattainable task. Yet, there are very convincing reasons for the donor countries to pursue leapfrog development in Honduras. If donor nations cannot succeed in creating a new, self-sustaining, economically developing Honduras—a relatively small country with a relatively small population—they will never be able to convincingly argue to other developing countries that *their* economic and sustainable de-

velopment prospects have a future any brighter in the twenty-first century than they had in the twentieth.

RISK TAKERS, RISK AVOIDERS, AND RISK MAKERS

There are people in society whose behavior is in the direction of risk avoidance. They shy away from taking chances, choosing the path with the fewest obstacles. These people are likely to return to the pre-Mitch conditions with which they have been most familiar. In society there are those who are conservative in their approach to risk; they pursue courses of action to minimize or avoid risk. In the post–Hurricane Mitch recovery phase, Honduran government leaders may not want to change the political or economic status quo that existed before. Those in power in the political system and in the economy before Hurricane Mitch would likely be reluctant to risk a change in their favored positions of influence and dominance in society, which would likely be a change for the worse, from their perspective.

Even in the context of the devastation associated with Hurricane Mitch, there is a tendency to want a society as it was, even though one's position in that society may not have been an advantageous one. This brings to mind the adage that "the devil we know is better than the devil we don't know." Thus, the tendency is to put things back as they were—the house back in the same place, the school in the same location, banana plantations rebuilt as they were, employment as it was, and so forth. To do otherwise would be to risk one's future well-being against the difficult odds of improving one's station in life.

On the other hand, many people are risk takers by choice. They hedge their bets even in the face of unfavorable odds in the hope of being successful and not having to suffer the adverse, unpleasant, or costly consequences. But this has the most meaning when one considers the options that the person making the decision has at the time of the choice. Clearly, a wealthy person has more options when faced with a crisis than does a poor person. This is especially true when it comes to preparing for or responding to the impacts of a natural hazard. The poor are often in the locations most at risk of disaster, living along riverbanks or on unstable steep slopes.

More important for this assessment, however, is the notion of risk makers. A risk maker makes decisions that can adversely affect the well-being of others without necessarily feeling the direct effects of his or her decisions. Leaders in a society, usually drawn from the upper classes, might make decisions that have an adverse impact on the future well-being of the poorer segments of society. For example, in the absence of land reform, in the poorer countries migrants will continue to build their dwellings in locations that are hazard prone, such as in floodplains or on unstable hillsides. As noted earlier, many of those victims of Hurricanes Fifi and Mitch lived in floodplains and on the unstable hillsides near urban areas. Apparently, whatever actions that were taken by the Honduran government after Hurricane Fifi in 1974 to reduce the risk of similar hazards for future generations were not enough to minimize the impacts of Hurricane Mitch.

The point is that those involved in designing a future for a post-Mitch Honduras must avoid creating new risks or increasing the existing ones in the face of future hurricane-related floods, mudslides, storm surges, and so on. One can only wonder which type of risk "personality" dominated the country's reconstruction process in the aftermath of Hurricane Fifi. It is necessary in the early stages of the post-Mitch reconstruction phase to identify those personalities, and the decisions that are risk making for the vulnerable segments of the Honduran population.

OBSTACLES TO ADDRESSING INTERGENERATIONAL EQUITY ISSUES

Perhaps a useful example to shed light on the problems of making drastic changes in the way society approaches the future is the case of the breakup of the Soviet Union in December 1991. Since that time, the majority of the Russian people have been subjected to very difficult economic conditions, very different from their lives under Communism. As a result of the hardships endured during the 1990s by the general public in the difficult transition toward democracy and capitalism, the Communist Party has received a resurgence of support at the expense of those supporting the transition. One can only wonder, knowing what they know now and given the choice today, a decade later, whether the Russian people would still have agreed to make the transition over such a short period of time, or even to have made it at all. Originally, Russian parents thought that the change would be good for their children. Now, ten years later, they are not even sure if their grandchildren will benefit from the present-day economic sacrifices of the Russian population.

It is believed that the *cost* of making a transition from a developing economy to a developed one is not *the* determining factor as to whether such a transition is pursued by the government of Honduras or the international donor community. Numerous political, economic, cultural, and psychological obstacles need to be overcome. The following discussion only touches upon a wide range of possible obstacles.

Social Obstacles

The poor in Honduras, as elsewhere, are living from day to day and season to season, seeking enough resources to feed their families. Because of this, there is a lack of will by the populace as well as the government to seriously consider the well-being of future generations. This could, in part, be the result of a general fear of what the future will bring and that it is better to accommodate the known needs of today rather than the unknown needs of tomorrow.

The notion of intergenerational equity, as proposed above, calls for an economic "safety net" for those in the present generation whose livelihood might be adversely affected by attempts to assure the well-being of future generations. Who will pay for such a safety net?

Political Obstacles

There is a history of corruption and political instability in the country and there has been no continuous interest in enacting reforms. As a direct result, the equitable distribution of land is lacking; much of the arable land is in the hands of the government and the two international Banana corporations.

International Obstacles

Massive international aid has not been forthcoming during peacetime by the international community. International organizations such as the World Bank that are in a position to provide enough aid to Honduras needed for such proposals, are bureaucracies and often do not respond to initiatives that are not "invented" within the organization (the "not-invented-here" problem). Additionally, governments often prefer bilateral aid and, consequently, the various donor countries do not often coordinate their aid-giving activities. Another obstacle is that donors have argued that Honduras did not have the "absorptive capacity" to use large sums of foreign assistance effectively and efficiently.

CONCLUDING COMMENTS

The main goal for this article was to draw attention to the vicious cycle that exists with regard to natural hazard impacts and societal vulnerability. We are bombarded throughout a given year with news stories about one climate-related disaster or another—forest fires, hurricanes, flooding, droughts. It seems that the unaffected (usually wealthier) nations, as observers, become truly concerned whenever a hazard turns into a disaster. Assistance is offered to help the immediate victims. But there are many disasters in a given time period, and concern dissipates over time. Compounding the long-term effects of the disaster in any given area is the tendency to "get life back to normal"; but "normal" may not have been very safe in the first place. Getting back to normal often means setting up the same society for similar disasters later on. Hence, decisions made by the present generation have major impacts on the well-being of future generations.

How, then, can this vicious cycle be broken? In the specific case of hurricane landfall in Honduras, are there actions that can be taken by individuals and societies to mitigate, if not avert, destruction and loss of life in the future? There does appear to be ways to do this. It would require an open meeting of Hondurans from all sectors and economic strata in society, as well as representatives of donor governments and agencies. The goal would be to design the Honduras that Hondurans themselves would like to have. For its part, the donor community would provide a realistic assessment of the assistance that they could provide over the long term with the objective to make Honduras a truly developing country. Constraints would be identified and methods to overcome them discussed.

One instructive exercise would be to revisit Hurricane Fifi impacts and reconstruction in order to identify the programs that were proposed and those that were actually carried out. The results of this survey would then be used to "speculate" about the impacts of Hurricane Mitch that might have been prevented had some of the proposed post-Fifi recovery plans been enacted. Those plans that were enacted could be evaluated for effectiveness with respect to the impacts of Hurricane Mitch.

In sum, the point of this article has been to highlight a neglected area of concern—intragenerational versus intergenerational conflicts—as it directly relates to development policy and the perpetuation of risk to climate-related natural hazards from one generation to the next. In this particular case, the focus

has been on one hurricane's impact on one developing Central American country. Similar generational conflicts exist in many other places and for other climate-related hazards, however. Failure to address these often implicit conflicts of generational justice (intra- and inter-) in a transparent way can only serve to perpetuate or heighten risks to future generations facing the same hazards in the same location. Openly and explicitly recognizing that there are trade-offs between the needs of present and future generations will most likely lead to a more prosperous, less vulnerable, more resilient future.

It is believed that the case study provided by the unfortunate impacts on Honduras of Hurricane Mitch in 1998 also provides an opportunity to address and resolve such conflicts, enabling Honduras to become a twenty-first-century showcase for leapfrog development and providing hope to those governments struggling to close the development gap between the rich and poor countries. It is also believed that framing the disaster response, recovery, and reconstruction issues in terms of the conflicts between present and future generations will lead to improved decisions about vulnerability reduction and resilience enhancement in rich and poor countries alike.

ACKNOWLEDGMENT

The National Center for Atmospheric Research is sponsored by the National Science Foundation.

REFERENCES

1. Berke, P. R., & Beatley, T. (1997). *After the hurricane: Linking recovery to sustainable development in the Caribbean.* Baltimore: Johns Hopkins University Press.
2. Mannheim, K. (1952). The problem of generations. In P. Kecskemeti (Ed.), *Essays on the sociology of knowledge* (pp. 276–322). London: Routledge. (Original work published 1925)
3. Glantz, M. H. (1990). *On assessing winners and losers in the context of global warming* (Report of the workshop held in St. Julians, Malta, 18–21 June 1990). Boulder, CO: National Center for Atmospheric Research.
4. Consultative Group for the Reconstruction and Transformation of Central America. (no date). Summary report of proceedings: Inter-American Development Bank Consultative Group meeting for the reconstruction and transformation of Central America, Stockholm, Sweden, 25–28 May 1999. http://www.iadb.org/regions/re2/consultative_group/summary.htm (7 November 2000).
5. U.S. State Department. (1999, March). *Background notes: Honduras.* Washington, DC: Bureau of Western Hemisphere Affairs.
6. Banks, A. S., & Muller, T. C. (1998). *Political handbook of the world, 1998.* Binghamton, NY: CSA Publications.
7. United Nations Development Program. (1998). *Human development report 1998*. Oxford, U.K.: Oxford University Press.
8. Juan-Ramon, V. Hugo. (1999, January). *Honduras's growth performance during 1970–97* (International Monetary Fund [IMF] Policy Paper PDP/99/1). Washington, DC: IMF. http://www.imf.org/external/pubs/ft/pdp/1999/pdp01.pdf (7 November 2000).
9. Associated Press. (1999, January 9). Central America faces years of hardship. *USA Today.* http://www.usatoday.com/weather/news/1998/wmtchrd.htm (29 June 2000).
10. Collier, R. (1998, November 9). Honduras: An economy swamped banana industry in ruins. *San Francisco Chronicle.* (Corporate Watch) http://www.corpwatch.org/trac/corner/worldnews/other/243.html (7 November 2000).
11. Price, N. (1998, November 17). Hilary Clinton, Jacques Chirac visit storm-damaged nations. *Topeka Capital-Journal.* http://www.cjonline.com/stories/111798/gov_hillarychirac.shtml (7 November 2000).
12. Associated Press. (1999, October 29). A year later, U.N. program still waiting for Mitch recovery funds. http://wire.ap.org/?FRONTID=HOME&SITE=APWEB&enter=Go (7 November 2000).
13. Riding, A. (1974, September 27). Honduras likely to need 2 years to recoup losses. *New York Times.*
14. *Keesings record of world events, 6–12 January.* (1975). London: Keesings Worldwide, p. 26904.
15. Diaz, H. F., & Pulwarty, R. S. (1997). *Hurricanes: Climate and socioeconomic impacts.* Berlin, Germany: Springer-Verlag.
16. Susman, P., O'Keefe, P., & Wisner, B. (1983). Global disasters: A radical interpretation. In K. Hewitt (Ed.), *Interpretations of calamity from the viewpoint of human ecology* (pp. 263–283). Boston: Allen and Unwin.
17. Chamorro, C. (1998, December 2). Catalyst for a better future. *Los Angeles Times*, p. 7.
18. Service, E. R. (1960). The law of evolutionary potential. In M. D. Sahlins & E. R. Service (Eds.), *Evolution and culture.* Ann Arbor: University of Michigan Press.
19. Bosrock, R. M. (1999, July 26). "Globalization" must not be synonym for "Americanization." *Minnesota Star Tribune*, p. D3.
20. Hamilton, W. D. (1963). The evolution of altruistic behavior. *American Naturalist, 97*, 354–356.
21. Sidgwick, H. (1907). *The methods of ethics* (7th ed.). London: Macmillan.
22. Rawls, J. (1971). *A theory of justice.* Cambridge, MA: Harvard University Press.
23. Brundtland, G. (1987). *World commission on environment and development: Our common future.* Oxford, U.K.: Oxford University Press.
24. Jamieson, D. (1998). Sustainability and beyond. *Ecological Economics, 24*, 183–192.
25. De-Shalit, A. (1995). *Why posterity matters: Environmental policies and future generations.* London: Routledge.