Reducing Environmental Impact of Disaster Relief

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<td>MTI</td>
<td>Medical Teams International</td>
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<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>IDES</td>
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Abstract

Natural events such as hurricanes, earthquakes, and tsunamis are becoming more frequent, and the devastation they cause affects the lives and livelihoods of hundreds of thousands each year. The poor, especially those in developing nations are disproportionately affected by the consequence of the increase in disasters. Due to the differences in expertise, technology, institutional capacity, and wealth, poor people of developing nations do not have the proper resources to cope with the disasters. The global community responds with support in efforts to help rebuild their lives, but may be inadvertently contributing to a second disaster, one that emphasizes the inequalities of poverty and hampers future development. The second disaster comes when well intending responders neglect to recognize that the life-saving resources they bring contribute to environmental degradation that hurts the poor. For this reason, organizations should seek to minimize their environmental impact during disaster relief in order to promote justice, dignity, and sustainability of aid during and after a disaster. To facilitate a more environmentally conscious approach to relief, I propose an organization to co-exist among other relief organizations that will facilitate environmental care during relief work.
Reducing Environmental Impact of Disaster Relief

Our vast world contains a spectrum of diversity that makes all living and non-living things unique. From the indigenous families of the Andes Mountains adorned in brightly-woven tapestries to the fast-paced, suit-wearing New Yorker, we are all unique, but we share the same planet. Upon seeing earth from space, American Astronaut Donald Williams said, “The things we share in the world are far more valuable than those that divide us” (as cited in Groody, 2010, p. 2). There is a phenomenon occurring, however, that exhibits grave discrimination threatening to separate the people of this planet. Disasters occur with greater frequency and disproportionately affect the poor, especially those in developing nations. Green (2008) reported “On average, the number of people affected by disasters in developing countries is 150 times higher than in rich countries, whereas the populations is only 5 times greater” (p. 246). Due to the differences in expertise, technology, institutional capacity, and wealth, people of developing nations do not have the proper resources to cope with the disasters. It is in these situations the global community responds rapidly.

When a disaster occurs in one part of the world, the global community responds. Modern telecommunications bring images of suffering people into our living rooms allowing us a glimpse of what they are going through. Using the language of Daniel Groody, we can view the world as a global village which reinforces the idea that we are all here together and that we are all working together. He recognized the positive dimensions of globalization in drawing together countries, economies, cultures, and ways of life with fresh approaches and a growing recognition of the interdependence of the human family and the international community (Groody, 2010, p. 118). When people respond to a crisis, it is humanity’s way of demonstrating we are a global village. Organizations responding to the needs of those affected by natural disasters provide an
outlet for international compassion and an avenue for action of this global village concept. Globally, people funnel financial resources to relief organizations that provide lifesaving medical care using modern technology, impromptu shelters to house the weary, and warm meals that both nourish the soul and the body—all to remind people they are not alone. Organizations that respond to disasters, however, may be unintentionally contributing to a second disaster, one that exacerbates the inequalities of poverty and hampers future development. This second disaster occurs when organizations neglect to consider the environmental impact of the waste (physical and human) that they contribute to a disaster scene.

For this reason, organizations should seek to minimize their environmental impact during disaster relief in order to promote justice, dignity, and sustainability of aid during and after a disaster. To facilitate a more environmentally conscious approach to relief, I propose an organization to co-exist among other relief organizations. This new organization would help to aid existing organizations to minimize their environmental impact during disaster relief in order to promote justice, dignity, sustainability for recipients of aid during and after initial disaster response.

Poverty in Time of Disaster

The countries that need help lack resources to cope with the mass devastation from a natural disaster. Debbie Baily from Medical Teams International (MTI) discussed why her organization did not respond to the devastating tsunami that hit Japan in 2012. Though thousands of lives were lost and entire towns were swallowed by the 133 feet high wave (The Tōhoku, 2011), Japan is a country that has the ability to help its people. She explained, “Japan has doctors and resources in other parts of the country they can pull from. They did not suggest they wanted or needed our help” (personal communication, February 21, 2013). She went on to explain that
when Haiti was hit, MTI immediately began to mobilize, knowing the conditions in Haiti would without a doubt leave the country reeling and unable to respond to the mass devastation.

People living in developing countries often depend directly on the land for survival making them extremely vulnerable to changing weather patterns. Sheridan Bartlett, a researcher with the International Institute for Environment and Development explained, “Increasingly unpredictable weather now affects hundreds of millions of farmers, resulting in food and water shortages, more illnesses and water-borne diseases, malnutrition, soil erosion, and disruption to water supplies” (Vidal, 2008, p 27). Even the slightest deviation from the norm could have devastating results for a rural farmer who depends on the consistency of the ecosystem to sustain life. The poor, however, also contribute to the problem. According to Sachs (2008) “In their desperation to stay alive, [the poor] are often contributing to massive local environmental degradation by depleting soils of nutrients, overfishing lakes and rivers, and clearing forests to make way for new farmland to absorb a rising population” (p. 31). Without adequate water in many regions, people are unable to grow crops and support livestock, eliminating the opportunity for them to participate in the market place and earn a living. When resources are no longer available, many move into the city hoping for new opportunities.

The urbanization of the poor further aggravates the conditions of poverty. Palen suggested “Today we are on the threshold of living in a world that for the first time will be numerically more urban than rural” (as cited in Conn and Ortiz, 2001, p. 64). However, many people end up living in squatter settlements with little to survive on. They live in cramped quarters with inadequate clean water and sanitation. When a disaster occurs, squalid conditions go from bad to worse. Massive loss of life occurs because of the treacherous conditions (e.g.,
crowded, unstable housing, poor sanitation) in which the poor are forced to live (Rothkopf, 2010). There is a huge relationship between inflicted damage and poverty.

**How are Organizations Managing Their Waste?**

Disasters, by their very nature, create tremendous debris. Depending on the type, severity, and location of the disaster, large amounts of wreckage complicate recovery efforts. Additionally, the influx of people coming to help also bring their share of debris by way of used medical equipment, food wrappers, water bottles, etc. Given that the infrastructure to handle increased garbage was likely very limited before the disaster—or completely unusable as a result of the disaster—I began to wonder how relief organizations, particularly Non-Governmental Organizations (NGOs), managed their own waste contribution (both physical and human). It should be noted that although I focus on NGOs there are other responders that should be noted. Governments, churches, and militaries all play a role in responding to disaster.

The disaster relief literature lacked information regarding how NGOs managed their waste while on the field. In an effort to understand this, I contacted several U.S. based organizations—International Emergency Disaster Emergency Services (IDES), Medical Teams International (MTI), Convoy of Hope (COH), among others—who had had various roles within the disaster relief context. I was particularly interested to understand how these organizations managed their garbage contribution while working in developing countries. Joe Lutrell of IDES said, "We bury it, just to keep it from getting into the streams, or we burn it, which isn't ideal, but it's what the locals do... We have to use what we have" (personal communication, March 12, 2013). Debbie Bailey, Disaster Response Team Coordinator with MTI shared the principle of "you pack it in, you pack it out" when responding to remote jungle areas and explained they...
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usually partner with local organizations during other times (personal communication, February 21, 2013). Other organizations echoed partnership as a waste management strategy.

A concern with this strategy, however, lies in the fact many developing nations have limited infrastructure and little capacity to deal with their own waste in ways that don't contribute to environmental degradation—let alone have the ability to accommodate the increased garbage caused by the disaster itself and brought in by aid workers. On a trip to India in 2010, I observed that even the most honest efforts to address the issue of garbage were thwarted by lack of access to facilities. In one particular village, after noticing the roads were remarkably clean, I mentally praised the town for the use of curbside trash receptacles; then I turned a corner and found that the garbage from each receptacle had been emptied down the hillside directly behind the trash cans. Though not in a disaster context, this suggests local methods of waste disposal might not always be reliable and could contribute to further degradation of the environment. Depending on local partnerships is not effective; rather it seems to shift responsibility without accountability.

Why is it important to consider the environment in disaster relief?

People in developing nations, especially those living in extreme poverty, have limited capacity to handle the consequences of such disasters. What they didn’t have prior to the disaster, they won’t have after a disaster. When relief organizations come to help those affected by disasters, there is a moral underpinning that the work they do will do no harm, and certainly the relief they provide will not contribute to further suffering. By not considering their environmental impact of their work, there is potential to contribute to a second disaster that degrades both the environment and the human spirit. Relief should be done with a framework that represents movement toward overall restoration of a community, and in developing nations,
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it is only a step in the direction of development. Organizations, then, should seek to minimize their environmental impact during disaster relief in order to promote justice, dignity, and sustainability for recipients of aid during and after a disaster.

**Justice**

It is important to implement practices that respect the environment in order to promote justice—equality and fairness—during difficult situations. In the simplest form, justice is manifested in the relationships between people, nature, and the creator. God emphasized the importance of justice when He commanded “You shall love your neighbor as yourself” (Mark 12: 31). In the disaster-relief context, people show love initially by responding to the urgent needs of humanity, to people who are suffering from the devastation of the natural world. Responders can continue to show love, by promoting humanizing activity and by providing a clean, healthy environment that leads to a right relationship with one’s self, the community, its social structures, and finally the environment itself (Groody, 2010, p. 27). Both the interpersonal relationship and the ecological relationship, which have been divinely orchestrated, should be acknowledged by the organizations in relief work. Myers (2006) wrote “Human beings, as image bearers of God, are intentionally placed in a system of relationships with God, with self, with community, with those perceived as “other,” and with our environment” (p.26). The two entities are profoundly interconnected in a series of relationships. When the environment is not considered as part of a holistic approach to relief efforts, the relationship between man and environment is severed. Additionally, justice implies right relationship between present and future generations. The teachings of Nicholas Wolterstorff suggested, “I am never to enhance the good in someone’s life, my own or another’s, or that of many others, at the cost of wronging someone, or other depriving her of that to which she has a right” (2008, p. 5). In other words, relief organizations should also consider future implications of environmental damage, and must
understand that the way they choose to deal with the waste they bring in could not only affect the people they are helping, but could also affect future generations.

**Dignity and Clean Environment are Human Rights**

Caring for the environment provides an opportunity to promote basic human rights. The Stockholm Declaration stated “Man has the fundamental right to freedom, equality, and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being” (Shelton, 2002, p. 3). Post-disaster settlements, however, often do not foster “an environment of quality” or promote “a life of dignity.” They are established quickly to meet the immediate needs of those affected by the disaster; they are often over-crowded, littered with garbage, and have limited access to clean water and sanitation. Human dignity cannot be preserved in a degraded or polluted environment. Therefore, it is lost. Instead, relief should be done in such a way that promotes dignity by incorporating systems that promote environmental quality and livability into relief efforts. Management of waste would go a long way to improve conditions for people living there. Human dignity and a sense of self-respect can be fostered by clean living conditions. Dignity is essential to recovery and can promote a sense of self-worth among survivors. We do not want the conditions in time of disaster to further degrade the poor as human beings. By promoting a basic human right—a clean environment—in relief services, and thus promoting dignity among those affected by disaster, relief workers can help to restore the identity of those they serve and to honor the human right to a clean environment.

**Holistic Care: Working Toward Sustainability**

Holistic care is a term often used in development work to represent an all-encompassing approach to development programs, an approach that represents an understanding of different components of human development. In relief work, holistic care should encompass not only the
traditional needs of food, shelter, and medical care, but should also extend to environmental care and future-oriented care. Relief work needs to be holistic in nature so that it enables people affected by disaster to recover and move toward sustainable development programs. By planning for the long-term outcome after the impact of disaster, relief organizations contribute by honoring the connection between humans and the earth. Martinussen (1997) suggested that without care for the environment, “the capacity for long term economic and social development will be undermined” (p. 152). Developing nations affected by disaster will not be able to work toward sustainable recovery in the post-disaster context if the environment is degraded in the process.

**Sustainable Practices: Fulfilling the Millennium Development Goals**

Relief should be done in a way that recognizes it is only part of the process that helps developing nations recover from disaster and move on to development. In 2000, the United Nations (UN) created the Millennium Development Goals (MDGs) which are a set of eight goals concerning poverty, education, gender equality, maternal health, reduced child mortality, disease, environmental sustainability, and global partnerships. These goals are meant to address human suffering through sustainable change. The UN stated that “Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs” (Our Common Future, n.d.).

Although disaster relief is not a component of the MDGs, it is beneficial to recognize how actions of relief organizations can be used to further development by simply not hindering it. Protecting the environment during relief efforts can contribute to the fulfillment of several MDGs: working toward eradicating poverty by protecting the land (a valuable resource to people living in developing countries); reducing child mortality and combating disease as well as
promoting maternal health (by promoting healthy living conditions); developing partnerships (by working with different sectors to create environmentally sustainable relief practices).

**Case Studies: Addressing Alternative Solutions**

In order to provide promote justice, protect dignity and ensure environmental sustainability when helping the people affected by disaster, it is essential that strategic planning be implemented. The following two examples provide real experiences with organizations addressing the immediate needs of water availability and proper sanitation. The solutions are not exhaustive by any means, but offer a starting point for organizations to begin thinking how they might adjust their current practices to leave a less negative environmental impact.

**Bottled water: A necessary, though temporary, evil**

After an emergency, organizations respond quickly to meet the most urgent needs of the people who have been affected. Access to clean, safe water is always a major concern, especially in areas of extreme poverty where it was limited prior to the disaster. The cholera epidemic in Haiti which continues since the devastating earthquake provides alarming statistics that validate these gestures. In 2012, the small half-island country represented 57% of the global cholera cases reported (Doucet, 2013). In efforts to mitigate the spread of disease that comes from contaminated water, organizations bring in bottled water. Clean, bottled water is an essential component of disaster relief, but one that should be viewed only as a temporary solution.

Although in this case environmental degradation isn’t immediately apparent, to the poor it can have lasting effects on health and livelihood. Bottled water truly is one the biggest environmental catastrophes our earth has ever experienced and has had detrimental impacts on multiple levels. To support the 8.75 million gallons of bottle water consumed in 2010, the Earth
Policy Institutes (EPI) estimated roughly 2.7 million tons of plastic (material derived from crude oil) was used (Arnold & Larson, 2006; “Bottled water”, 2011). While much of that was used for personal consumption not related to disaster, it is important to recognize the environmental implications are the same, regardless of the context in which the bottle water is consumed. Oil is then used not only during the manufacturing of the plastic bottles, but also when transporting the bottles between the bottling facility and the consumer market, releasing toxins into the air and dispersing them throughout the globe. EPI suggested “Western Europe’s shipment of bottled water to New York City releases 3,800 tons of pollution” (as cited in Didier, n.d.).

Environmental degradation continues after the water bottles have been distributed by well-intending organizations. Many developing nations lack proper disposal facilities so plastic bottles are often buried or burned. EPI indicated that a buried water bottle could take up to 1,000 years to biodegrade (Arnold & Larson, 2006) and could potentially leak chemicals into groundwater during the decomposing process. Plastic water bottles that are burned release toxic by-products, such as chlorine gas and ash containing heavy metals into the atmosphere (Arnold & Larson, 2006; Didier, n.d.). After these toxins are released into the air, we breathe them, or they fall back to the ground contribute to soil and water contamination.

One organization is taking a different approach to providing clean water in areas of disaster. Convoy of Hope (COH)—considered to be a first responder organization—is working to implement new water purification technologies into their relief work. In an interview, Aimee Short and Ryan Grabill, both part of the Disaster Response Development Team, discussed the use of individual Sawyer Water Filtration Systems as an alternative to bringing water bottles into a country during relief efforts (personal communication, March 7, 2013). These filters flow at about 1.0 liters per minute and eliminate 99.99% of waterborne diseases (“Sawyer Hollow”,...
A more natural solution to the use of water bottles could be the use of a Moringa oleifera (Moringa) water filtration system. Crushed Moringa seeds are able to treat dirty water by acting as a coagulant and an antimicrobial agent (Doerr, 2005). The positively-charged seed powder clings to the negatively charged sediment that contaminates waters, and settles to the bottom of the container (Selwa, 2010). Doerr reported, “Findings support recombinant proteins both removing microorganisms by coagulation as well as acting directly as growth inhibitors of the microorganisms” (2005). Using Moringa in a water filtration system would create a sustainable solution to lack of clean water. Moringa is drought-resistant and readily grows in regions in Latin America, the Caribbean, Africa, and Asia—which are also area that frequently experience disasters. Using this source would be cost-effective for organizations as well as sustainable for the locals who would be able to continue using this method of filtration. Using a natural solution like Moringa would benefit the environment both in the disaster zone and world-wide by decreasing the demand for the water bottles and limiting the opportunity for harmful disposal practices. Additionally, organizations could train the local population in constructing Moringa filtration systems, and then employ people to further distribute the knowledge and the systems throughout the region. Doing this would be a beneficial way not only to meet the immediate needs of the people, but also to bring about long-term solutions to water problems in developing nations.
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Sanitation

Just as problems with clean drinking water are not exclusive to disaster times, sanitation problems aren’t exclusive post-disaster scenarios. According the World Health Organization, in 2010, there were an estimated 2.5 billion people without improved sanitation, and roughly 15 percent of the global population still practice open defecation (WHO, 2012). Sanitation becomes a dire concern, however, when a high-impact event affects multitudes in an area with little or no infrastructure—on top of the damage resulting from the disaster. In Haiti, the earthquake of 2010 exacerbated the extreme unsanitary conditions of the capital city. Port-au-Prince, with 3 million inhabitants living in a space the size of Chicago, is one of the largest cities in the world without a sewer system (Knox, 2012). The sewage of the entire population flows through open ditches where it mixes with debris and other garbage. When it rains, the ditches fill with rain pushing the sewage and garbage out into the open increasing the risk of illness.

Joe Lutrell of International Disaster Emergency Service (IDES) described his experience in Haiti following the earthquake: “Haiti doesn’t have resources to do hardly anything really as necessary; it was an environmental nightmare, quite honestly” (personal communication, March 12, 2013). Some of the bigger organizations tried to bring in portapots, but once they were full, people would tip them over, dumping the sewage into streams, so they could be placed upright and used again (personal communication, March 12, 2013). People would dilute the waste with water when possible. His organization tried to implement a different solution by digging a large trench and putting a portapot over part of the hole. As it would get full, they buried the waste, and moved the pot further down the trench. They used lime to keep the smell and insects down. Lutrell questioned, “What are you going to do? Haiti is just a different case because it is so
Like many developing nations, Haiti’s pre-existing symptoms of poverty (including lack of infrastructure) perpetuated struggles after the disaster.

Though efforts to incorporate sanitation into relief efforts in Port-au-Prince were well intending, the magnitude of the devastation left such solutions unsustainable. Organizations responding to disasters should consider utilizing composting toilets as a means to handle the waste of the workers as well as the people they have come to serve.

The use of composting toilets has the potential not only to combat poor sanitation, but also to provide benefits to the agricultural sectors hit by disasters. Sasha Kramer, co-founder of Sustainable Organic Integrated Livelihoods, saw after a 2004 visit to Haiti how composting toilets could help the impoverished country on multiple levels. Flammer explained, “Collecting, composting, and recycling human waste into fertilizer for agriculture simultaneously helps solve so many problems that result from extreme poverty: poor public health, low agricultural productivity, malnutrition, environmental degradation, and waterborne diseases” (2012, p. 34). Composting toilets would protect further environmental degradation that occurs unintentionally following a disaster and would promote better health for the community as it recovers and moves into development.

**Challenges**

Implementing practices during relief that also represent environmental care, though ideal, may be difficult. Organizations will have to convince donors of the importance of incorporating such practices. They will have to strike a balance between existing missions and implementing new strategies to avoid mission drift, and they will have to organize in such a way that facilitates green practices during relief.
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Donor Support

Perhaps one of the biggest challenges in reworking the framework of a disaster relief organization to include environmental sustainability during relief will come from donor support. A survey by AlterNet, a global humanitarian news service, targeted the world’s largest aid groups and asked experts to assess the future of humanitarian need, challenges of delivering relief, spending and funding trends, and value for money in the international aid system. Gerken reported, “For many donors, installing a city drainage system or devising a program to help coastal villagers cope with rising sea levels just doesn't sound as appealing as distributing food rations to 100,000 earthquake survivors or vaccinating 20,000 children in a refugee camp” (2012).

Convincing donors and organizations workers to care for the earth while helping victims of disaster maybe difficult as they may not see it as the best allocation of resources, but it is essential in guaranteeing the organizations are not doing more harm in the long run. Repercussions of an ill-treated earth will have negative impacts on the poor further down the road, contributing to the demand of future aid. In a sense, caring for the earth while responding to a disaster can be seen as pre-emptive for the next. Organizations can work with donors through donor education programs that highlight the benefits of working toward environmentally sustainable practices and solutions during relief.

Another way to persuade donors to accept the idea of environmental care during relief is through what CARE International’s Joan Lundgren called Multi Asset Partnerships (personal communication, March 14, 2013). These partnerships represent a mutually beneficial relationship between the donors and the organization. Lundgren said that while philanthropy primarily brings the resources in, multi-asset partnerships provide more incentives for large
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Donors may support the idea of environmental care during relief if they understand that doing so will benefit their mission.

Mission Drift

For an organization to excel and be the top performer in its field, it is essential that it avoids mission drift. While I am challenging organizations to recognize the importance of considering the environment, it is imperative they do not drift from their initial mission. Instead, they should incorporate the environment into the existing mission, recognizing how environmental care contributes to the overall success and goal of helping people. Implementing such practices may bring challenges. Organizations whose focus is on immediate care may be unable to allocate time and resources to an environmental component. Nonetheless, it is one that needs to enter the conversation about relief work.

Organizational Strategy

For organizations to implement relief strategies that include care for the environment may be difficult. They will first need to strategize and to look within the organization to see where they could incorporate new practices. Even after doing so, however, it may be difficult to implement practices in time of disaster. Sometimes an idea that sounds plausible on paper is much more difficult to put into practice.

Innovative Thinking with a Green Relief Organization

In my research for this thesis project, I have identified a void in the disaster relief arena. While organizations identify the immediate needs of people affected by disaster to be medical care, food, and shelter, a fourth major component to consider should be the environment. Many developing countries lack the infrastructure to support the increased waste (both physical and human) that the relief and development workers bring. Because of this, an environmental disaster
looms in the midst of humanitarian efforts to help people. Through immediate efforts of these organizations, there is a potential to contribute to further environmental degradation of the earth, thus contributing to a second disaster. A second disaster not only perpetuates the cycle of poverty and contributes to loss of dignity, but it also slows recovery and development. Because I understand the immediate needs of the people are the first priority to organizations during the post-disaster relief phase, I suggest the creation of a complementary organization, a “green relief” organization. (“GRO” will be used to differentiate this “green relief” organization from existing aid organizations.) GRO would serve to address the environmental needs following a disaster, specifically addressing the physical and human waste generated. The mission of GRO would be to protect the environment from further degradation and to work toward sustainable practices in order to promote justice in the time of chaos, enhance dignity during relief, and promote environmentally just practices that will help—not hinder—future development of poor nations affected by disaster.

To do this, GRO would conduct extensive studies to understand the way relief organizations have addressed their environmental impact in prior disasters and the way their environmental impact has been felt by beneficiaries using participatory action research (PAR) and qualitative methodology. Information gleaned from the research would be utilized to co-create strategic disaster response plans that take into account the environment and would the apply Environmental Impact Assessment (EIA) to ensure maximum effectiveness with least negative environmental impact. GRO would also have a research and development team that both creates and scouts out green technologies to be implemented in practice and makes these technologies available for organizations. GRO would then work with existing organizations to build local capacity during relief efforts to help maintain a healthy environment in post-disaster
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scenarios and beyond. Finally, GRO would evaluate programs with more informal and formal evaluation tools. In doing these things, GRO would help organizations respond to disasters with an environmental inclusion component that would mitigate a potential second disaster following disaster relief.

Participatory Action Research

In order for GRO to facilitate implementation of best environmental practices during relief, it is important have a clear understanding of what past disaster situations have revealed about the environmental impact. Using participatory action research (PAR) and qualitative inquiry, GRO would gather information about environmental practices of relief agencies in disaster response scenarios. In 2011, 332 natural disasters were reported from which GRO could begin to gather data (Guha-Sapir, Vos, Below, & Ponserre, 2012). Researchers could target specifically garbage and sanitation management, both of which have immediate health risks if unaddressed. GRO would also be present in the aftermath of future disasters to observe current practices during relief and to talk with recipients of care.

Participatory Action Research is beneficial because it opens up opportunity for inclusion in problem solving; in this case, the problem may be practices that environmentally degrade the area during relief. Ramos (2002) explained, “Action research promotes broad participation in the research process and supports action leading to a more just or satisfying situation for stakeholders“ (p. 1). With PAR, the people affected by disasters become partners in finding solutions to relief practices. This partnership will promote collective action among participants and encourage ownership in the recovery process. Myers said, “Communities discover that it is indeed their development [also recovery] process that is underway and that they are capable of exercising choice and becoming capable of managing their own development [also recovery].”
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(1999, p. 148). When people affected by disaster understand they are valued contributors, they become empowered to make changes.

In a sense then, using PAR in constructing better environmental practices can be a way of promoting justice in disaster relief scenarios. In this context, it not only recognizes the importance of restoring the people to the land, but it also restores the relationship between the relief organizations and the people receiving help. Thoughtful post-disaster relief, especially in an area wrought with poverty, gives the aid worker an opportunity to foster purpose and hope in the people they seek to serve. In this case, GRO would also encourage growth from within the country providing a platform and support the people involved in recovery process.

Another important aspect of action research is that it encourages the researcher to study the culture and environment of the people they are working with. GRO would benefit from Ramos’s proposal that “Action researchers need to know more about a local culture, how innovations are diffused there, the intricacies of the local power structure, and other concepts that would help them to help locals better their situation” (2002). This will be imperative as GRO and relief organizations begin to strategize how to implement better environmental practices during relief. Though disasters are unpredictable by nature, because they are increasing, it is reasonable to identify particularly vulnerable populations to see how they have managed the environment in previous post-disaster situations and in what capacity the local populations are managing waste when disaster has not occurred.

PAR will provide an opportunity for organizational partnerships to grow while addressing environmental practices and strategies during relief. In doing so, part of the mitigation practices could be identifying areas of vulnerability. Haiti, for example, lies directly in the path of hurricanes. With the prevalence of hurricanes increasing, discussing the potential
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role for GRO in future emergencies is a necessary tool in disaster preparedness. During these pre-disaster discussions, waste facility sites can be established and mapped out. GRO in conjunction with the government will identify three to five sites that could work as waste recovery sites. In the case of extreme humanitarian crisis, this may be reevaluated to be most effective.

Education for Donors and Organizations

A two-pronged educational component will be facilitated by GRO to include donor education and organization education components. Because donors help drive what happens in organizations, it is important to include them in the dialogue about first, why environmental care is necessary to the people receiving aid, and second, what organizational missions they can support to encourage growth in environmentally conscious relief programs. Thomas Friedman (2000) discussed harnessing the economic self-interests of companies and consumers to be a force that can work to drive environmental protection and promote human rights (p. 208). Essentially, this concept could be applied to the social sector as well. With education, donors will not only expect to see life-saving efforts as part of measurable success and return on their investment, but they will also expect the return to be one that is environmentally sustainable. In a disaster relief context, and with the limited capacity of some countries to manage waste even prior to disasters, donors can expect that organizations going into a country have a waste management plan comparable to the standards set in the United States.

The second prong of the educational component will involve GRO and existing organizations. Many organizations respond with the primary focus to meet the immediate need; they may or may not, however, be aware of the unintended consequences of neglecting the environment during care. They need to understand the importance of environmental care during
relief and how neglecting to consider their environmental impact may hamper longevity of success in the field. As seen in Haiti, efforts to help were undermined when the aid provided unintentionally introduced cholera by not fully addressing sanitation issues (Knox, 2010). Also, having done field research regarding environmental practices, GRO will be in a position to educate organizations about what they have learned and also to share ideas that have come from the field in what recipients of aid would have liked to see in the disaster response. Education will be not only informational, but also collaborative in nature. Organizations will also be given tools to help reflect on practices that they have seen or experienced in the field.

There is a need to link new ideas and practices to existing organizations. As part of the response team for Convoy of Hope, Ryan Grabill lamented, “Honestly, the technology has not caught up with the need in some cases” (personal communication, March 7, 2013). While that is reality in many cases, the bigger problem is getting the technology into the hands of the people who can use it. Modern telecommunication has created idea-sharing spaces, and though organizations already structured to respond to a disaster might not have time to connect to innovative green ideas, a coexisting GRO would. Richard Walden, CEO of Operation USA, said he understood the importance of green technologies and environmentally sound practices; he attends trade shows once or twice a year so he is aware of new practices (personal communication, March 13, 2013). Depending on the capacity of organizations, doing this may be a challenge, so partnering with a GRO would help to share innovative ideas with relief organizations and facilitate getting the technology implemented into existing programs.

**Hiring Locals and Building Capacity**

Following disasters, responders often are so focused on meeting the immediate needs (medical needs, food, and shelter) that they neglect to consider environmental care during relief,
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thus potentially contributing to a second disaster. Information from studying past disaster response situations will guide GRO on further identifying environmental problems in relief.

Initially, I have identified that garbage disposal and waste disposal are two major concerns. GRO could help facilitate programs that would hire locals to help in immediate efforts to address these issues, and consequently, aid the people affected by disaster in protecting their human right to a clean environment and in promoting dignity within tent cities and other post disaster dwellings.

While organizations responding to a disaster may not be able to address the packaging of the food and supplies things they bring in, the local population could help. GRO would implement a Waste Recovery Program immediately following a disaster with the sole purpose of being another dimension of relief in addition to typical medical, food, and shelter missions. Able-bodied individuals would be hired and trained by GRO as Waster Recovery Specialists to collect and sort aid remnants into compostable, re-usable, and garbage materials used specifically in disaster relief efforts. Additionally, this program could be expanded to address the issue of disaster related debris, but for the purpose of initial start-up, it would focus on the specific niche of helping responding organizations manage their garbage output. Hiring locals immediately begins the road to self-sufficiency by providing much needed income post-disaster. Where people are typically chronically underemployed, finding ways to strengthen local economy is essential to recovery (Adelman, 2011, p. 92). Additionally, the work contributes to the psychological well-being of those affected by disaster by giving them a purpose and a hope for their future in time of chaos. An opportunity such as this would provide job skills, income, and a sustainable solution to waste management in developing countries affected by disasters.
Sanitation issues are another main priority following a large-impact disaster. In efforts to maintain sanitation, an organization might bring in portable toilets and hand washing stations. However, as seen with the tipping over of portapots in Haiti, if organizations don’t also consider mobilizing a maintenance team, even the best efforts could have negative consequences. There are three ways GRO could help influence sanitation issues in relief efforts. First, GRO could make sanitation one of their main missions in relief efforts, thereby eliminating the pressure on other organizations to implement sanitation programs alongside their medical, food, and shelter programs. Second, they could work alongside organizations that do have accompanying sanitation solutions such as portapots and facilitate the maintenance and waste disposal of such solutions. Thirdly, GRO could work with green technologies to implement compostable toilets as a mechanism to give purpose to waste facilities. GRO would be the organization that not only provides the toilets, but also trains the local people how to turn humanure—as it is called—into viable compost. Implementing this solution would not only help with sanitation issues, but would begin the road to self-sustainability in three critical ways: first, the humanure would be used to fertilize food crops, helping people to work away from food handouts; second, the human compost is an ecological idea that is gaining momentum, not just in developing countries but worldwide; it could be seen as an idea to invest in; and third, teaching the local population about composting will help give another purpose in time of chaos and more hope for the future.

**Evaluative Tools**

Dean Karlan and Jacob Appel, behavior economists, explained it is not enough to think of creative new solutions. They said, “Innovation without evaluation does not help the world as much as innovation with evaluation” (2011, p. 272). GRO as a partner organization to existing relief agencies needs to evaluate both their own practices as well as the strategies they implement.
with partner organizations. Evaluations can happen with formal and informal techniques. Basic qualitative methods are imperative in informal evaluations. They encourage feedback from parties who are part of the solutions, or who are receiving benefits of a program. GRO would ask questions like: Are post-disaster environments as clean as they reasonably can be? Are people living in sanitary conditions? Are human dignity and rights being addressed in post-disaster scenarios? If so, how are the recipients in aid relating to these things? Additionally, with programs meant not only to help protect the environment but also to help heal the local economy and the psyche of the victims—do they feel it is working? How quickly are areas hit by disaster moving from the relief phase to the recovery phase?

Formal assessment guidelines are also available. The Environmental Impact Assessment (EIA) has become widely accepted. According to the Encyclopedia of Earth website, “Environmental Impact Assessments (EIA) are interdisciplinary analyses of the natural, human health, and socio-cultural effects which are expected to result from public and private sector actions such as development projects” (Fellemen, 2010). Specifically, this tool helps to determine the impact of a proposed idea. It forces organizations to think through strategies in a different context. In the disaster relief arena, GRO could help organizations with relief programs critically think through questions such as, how will the packaging from the medical supplies be disposed of? What affect will prepackaged food have on garbage sites? Are there planned garbage sites? How we will handle human waste in a country that no longer has a working sewer system post-disaster?

This organization though initially is meant for the disaster relief context could play a major role in encouraging and facilitating change among other organizations working primarily in the development context.
In order to promote justice, dignity, and environmental sustainability for victims of disaster during relief, organizations need to consider the environmental impact of their practices. Specifically, aid organizations should consider the reality that they contribute waste when responding to disasters, and often times local capacity is unable to facilitate this. Because their efforts are critical to the survival of many suffering people, however, the aid organizations themselves need help. An organization that offers thoughtful strategies to manage human and material waste as well as strategies to avert a second disaster would be an important addition to any disaster relief situation. Addressing the idea of environmental degradation during relief promotes development even in a time of chaos which contributes to the overall health of not only the community affected but also the entire earth.
References


