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Risk Reduction: Not Just About Earthquakes
The Role of the Soarway Foundation

US Ambassador (Retired) Scott H. DeLisi

When I went to Nepal as Ambassador in 2010 it was a few short months after the disastrous earthquake in Haiti. Over 230,000 people died in that quake and its aftermath. We saw the trauma, the devastation and the families in despair. Our hearts were touched and we asked, "What can we do? How can we help?" Donations flooded in. People responded. And that was the right thing to do.

I felt the pain of the survivors in Haiti as did anyone who paid attention. But it also occurred to me that if we truly care, if we feel called to respond when we see such suffering and devastation, then the time to act is not *after* tens of thousands are dead and hundreds of thousands injured and homeless. The time to act is now.

That understanding convinced me that disaster risk reduction and preparedness had to be central to my engagement in Nepal as Ambassador, and it still is central to my work in Nepal as Executive Director of the Soarway Foundation today. The quakes in Nepal in 2015 do not lessen our need to engage - they remind us that our work is more critical than ever.

We know that every step we take to educate people about risk, to make their homes and schools safer, and to build capacity before disasters strike, will save lives. But we also know that we must complement disaster *preparedness* with carefully conceived plans for disaster *response*. Plans that have been exercised and refined and that ensure caches of critically needed stocks of water, food, medicine, shelter materials, and fuel, are prepositioned. And, as we saw in the earthquakes in 2015, the communication infrastructure is also vital. Developing the capacity to ensure access to, and sharing of, information is another first order requirement.

Quite simply, Nepal remains one of the most seismically vulnerable nations on the planet. Sadly, however, too many believe that they have experienced "the quake" of their lifetime and they are now content to accept complacency rather than action, believing that the next disaster will be a concern for future generations. They are wrong. The next disaster can strike at any time and our duty, and the nation's need, is that we act today to make tomorrow safer for all.

At Soarway, our goal is to partner with the people of Nepal to build a future that they can face with confidence rather than fear; a future that truly *is* safer. There are, however, fundamental challenges that complicate our efforts. As Ambassador I learned that the mission of disaster risk reduction and preparedness – as essential as it may be – is easy for policy makers to ignore.

The reality is that, although we invariably respond when disaster strikes, allocating the resources to save lives *before* the disaster is a tougher proposition. Budgeting funds to address a future risk – no matter how threatening or likely is too often overshadowed by current budgetary concerns of political imperatives. Even though we know that a small investment in preparedness today will save lives (and money) when we are forced to respond to a future disaster, we leave our wallets and our hearts closed hoping, perhaps, that the disaster will never strike. But we know that it will. And, although the victims of the tragedy will become horribly real to us *after* the disaster, *before* it strikes they are only abstract figures in a sterile debate about budgetary requirements.

Whether the people whose lives we save are in our own country or on a foreign shore, they are real, they matter, and we can, if we are willing and committed, change their future. To do so we need to approach disaster preparedness and emergency response as two sides of the same coin which they are– and we must develop a holistic approach to engagement and funding. That is what we began to do when I was Ambassador in Nepal and it is work that must continue today.

This journal is published twice a year by the Global Nepali Professional Network (GNPN). The GNPN is an American organization dedicated to the professional development of its members and technological progress of Nepal. It is a tax-exempt 501(c)(3) non-profit organization with members throughout the United States. The organization utilizes the creativity and talent of its members and the broader American community to develop technology-rich solutions that address some of Nepal's challenges.

The GNPN was originally established in July 29th, 2007 at the University of California Berkeley (UC-Berkeley) under the name CAN-USA.

Please visit our website at gnpn.org.

However, as we have built Soarway, we have learned that disaster risk reduction is not only about preparing for the next earthquake, or flood, or fire. It is not just about building a strong home or safe school. It is about people too. It is not about donors, or NGOs, or governments telling people how to be safe. It is about people who believe they *can a*nd *should shape their* own future. It is about people who believe that they can make a difference for themselves and their families and their communities. It is about partners like Soarway who respect those people and their communities enough to share their vision rather than trying to impose our own.

The challenge is to find those partners in Nepal. Sadly, it is hard to believe in yourself or in change when you are mired in a cycle of poverty. It is hard to believe in yourself when the national narrative often casts Nepal and its people as a "yam between two boulders" – helpless pawns waiting to be acted upon by external forces rather than seeking to shape their own destiny. If you are one of the youth who make up the bulk of the population, it is hard to believe that change is possible when you are told not to speak, not to lead, not to challenge by those who are elder and who, by virtue of their years assert the right to lead but seem unwilling to empower or prepare those who must lead in the years ahead.

As a result, the Soarway Foundation knows that our engagement with Nepal needs to be as much about empowerment as it is about risk reduction. We leave it to governments and to large international development partners to fund the massive rebuilding projects that are beyond our scope. Although our work may not touch as many as they do, we know that our impact is real and often transformational. Our programs serve as models…as catalysts…that demonstrate what is possible with effort, commitment and vision, even without government backing or huge budgets.

We remind people that the future is theirs to shape through their effort and engagement and that the answers to the challenges we face lie in ourselves, not in waiting for others to solve them for us. At Soarway we know that our best programs are those that draw on the wisdom, leadership and commitment of our Nepali partners who are already making a difference, who know the needs of the communities they serve, and who have earned their trust.

I invite you to visit www.Soarway.org to learn more of what we do. Or follow us on Facebook at www.Facebook.com/Soarway.org . See the work we have done with the Nepal Ambulance Service to not only save lives today, but to build the capacity to respond to disasters tomorrow. Take a look

at our engagement with the Sarokar Foundation, which has made fire safety training and earthquake preparedness a top priority. Follow the work of our Women's Entrepreneur Group in Biratnagar who have turned a dream into meaningful livelihoods for 52 women in the first year.

Witness the efforts of The Partners Nepal to restore the environment and preserve the culture in Solukhumbu, knowing that in doing so we strengthen the communities who live there. Or look at the impact of our engagement with people with disabilities as we seek to foster accessible tourism and create jobs and economic growth while drawing on the skills and abilities of those who have often been invisible in society.

Our list of projects is long and getting longer. Although they may not be huge, they touch lives, change lives, and even save lives. They reach real people and make a difference to those we support.

At Soarway, we believe we can be a voice for Nepal, a platform for engagement and coordination, and, working with the Nepali diaspora community, a partner to bring a greater energy and focus to Nepal. We cannot do it alone, however. The problems we seek to tackle are often complex and always larger in scope than we alone can resolve. That is why we emphasize partnership with organizations based in Nepal and led by Nepalis. Organizations that share our commitment to accountability and transparency and who, like us, seek to have a demonstrable impact. And that is why we also seek innovative approaches, working in tandem with partners in academia like Stanford University and Cornell, or with forward thinkers in the private sector who know that conscious capitalism – a constructive focus on social good as well as profit – matters. We hope to build networks that transcend community and caste and ethnicity and that are united instead by a shared commitment to Nepal and all of its people.

I hope you will support us because, quite simply, we cannot do it alone. Please consider, for example, joining the Soarway 1000 – our group of core supporters who are donating at least $10 a month to give us a sustainable base of operating capital to continue our work. We seek 1000 partners. Make a difference. Become one of them. Ten dollars a month is two Starbucks coffees. It is one trip to McDonalds. It is thirty-three cents a day. That's nothing for us, but it is priceless for those we touch in Nepal.

For me, Nepal's narrative is not about victims buffeted by poverty and natural disasters and waiting to be saved. Instead I see a story of hope, founded in the strength, courage and resiliency of the people of Nepal.

Disasters will continue to strike; that we cannot change. But we can prepare, we can plan, and we can commit ourselves to make a difference on behalf of the people of Nepal. That is what Soarway does. We hope you'll join us in the effort.

US Ambassador (Retired) Scott H. DeLisi

Scott DeLisi was a career diplomat for the United States for 35 years. His overseas postings included as American Ambassador to the Republic of Uganda from 2012 - 2015, Ambassador to Nepal from 2010 – 2012 and Ambassador to the State of Eritrea, 2004 -2007. Ambassador DeLisi's Washington postings included service as Director of Career Development and Assignments and Director for Southern Africa Affairs. He was the recipient of two Presidential Rank Awards, the Cobb Award for Initiative and Success in Trade Development, the James Clement Dunn Award for Excellence, the CIA Director's Award, and the DIA Director's Award, among others. Today he is the Executive Director of the Soarway Foundation dedicated to creating a safer and more prosperous future for Nepal, and he remains an Advisor to the Department of State and is a lecturer and consultant.

GNPN to Hold Annual Conference In Silicon Valley "Connect, Grow, Change"

By Andrew C. Gorham
Midwest Regional Vice President, GNPN

The Global Nepali Professional Network (GNPN) was founded on the campus of the University of California, at Berkeley in 2007. Since this time our goal has been to go beyond simply discussing common challenges faced by Nepal and other parts of the developing world. A key part of our mission has been to actively execute solutions to difficult problems by helping to connect and build partnerships between skilled individuals and organizations throughout the world. In short, we are a professional networking and focused problem-solving organization.

To execute this mission, it is necessary to meet annually in one location to share ideas and practices, meet with key problem solvers, and plan future efforts. This conference will take place in the heart of Silicon Valley, San Jose, California on September 29th. Our theme is "Connect, Grow, Change". We are thrilled to have an illustrious keynote speaker for our conference this year- the Honorable US Ambassador (Retired), Scott H. DeLisi. Since leaving his diplomatic post, Ambassador DeLisi has continued to play a major role in advocating for disaster risk reduction in Nepal. Ambassador DeLisi's post-ambassadorship has been described as perhaps the most significant post-ambassadorship in the history of Nepal.

Silicon Valley is a uniquely positioned innovation hub, with multiple world-class universities, researchers, and professional organizations. It is the capital to the world's technology innovations, home to leading businesses and industries, and boasts a passionate and highly educated community of professionals who are eager to make a difference on issues of global interest and consequence. Silicon Valley also hosts a vibrant Nepali-American community, many of whom work in leading institutions. Our conference will have numerous attendees from all leading technology institutions in the Silicon Valley, each of them eager to see the efforts presented in this conference.

GNPN has become an established fixture in Silicon Valley, one which many residents rely on to receive information about and understand important issues and challenges in the developing world, especially those that can be addressed by technology. Previously, papers that have been presented in GNPN conferences have received tremendous support from the Silicon Valley establishment and have gone on to become concepts, then projects, and eventually successful projects that have been internationally-recognized and praised.

We would like to invite everyone, especially those in Nepal, to contribute a paper for consideration in this conference. We will make provisions for remote presentation of accepted papers for those who cannot travel to Silicon Valley. We would also like to invite everyone to register for and participate in this conference.


Andrew Gorham

Abstracts may be submitted via our website or by direct email to abstract@gnpn.org. Abstracts must contain the paper's title, the author's name and email and be no longer than 500 words in length.
Please visit our website to register for this conference. www.gnpn.org
Andrew Gorham is the Midwest Regional Vice President of GNPN. He is also a co-Chairman of the GNPN 2018 Conference. He lives in Austin, Texas working as a Senior Consultant for a major corporation involved in facilitating large-scale global manufacturing.

Wherever you live in the world, let's collaborate to help Nepal

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Electronics for Developing Countries: Three Prerequisites for Responsibility

Pamela J. Gordon
Director of Partnerships for the Presidio Graduate School

Last week I handed a laptop computer that I no longer use to a local asset-recovery company here in Silicon Valley. Surplus Service will remove my data, refurbish and resell the laptop, and protect workers and the environment at every step.

CEO Lou Ramondetta's aim is to maximize the economic value of used electronics, medical equipment, and retail goods, such that recycling and landfill are a last resort. "Our employees work in a recently upgraded, well-lit facility, wearing protective gear, and following documented processes for human and environmental health. When we must recycle some of the assets, we use only those recyclers certified to ethical-recycling standards."

By contrast, a no-longer-working personal computer in many developing countries would take a different path, often at risk to both human and environmental health.

According to a January 2018 article in the *Journal of Material Cycles and Waste Management*[1], electronics waste in Nepal is processed manually by a workforce of more than 10,000 people in Kathmandu. This informal process comprises numerous steps that are injurious to workers: handling sharp and contaminated materials without gloves (such as pulling copper wire from devices and handling CRT screens), breathing toxic fumes from the open-burning and acid-leaching of heavy metals, and whether working or not the workers and their family breath air, drink water, and grow food contaminated by heavy metals, brominated dioxins, and environmentally-persistent toxic materials. "Dietary and non-dietary intake of such substances is associated with severe human health issues including respiratory irritation, skin injury, and circulatory failure." Designers and producers of electronics that ends up in developing countries -- whether new or used, sold or donated -- can take three steps to help close the gap between responsible and hazardous e-waste treatment, and also reduce power requirements:

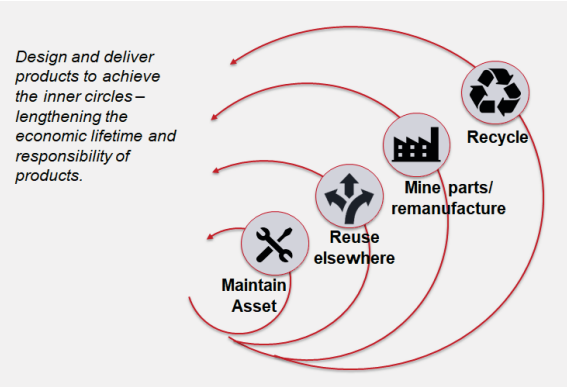
1. Design products and business models for the Circular Economy
2. Deploy Eco-Design to reduce products' power consumption
3. Invest in repair-and-recycling infrastructure where products are used

Design products and business models for the Circular Economy

The world has been operating largely in the Linear Economy, in which companies extract materials from the earth (metals, petroleum for plastics, etc.) for manufacturing products, then sell them for typically one-time use and discard. The Linear Economy - **Take, Make, Waste** - falsely assumes that the earth has an unlimited amount both of resources and capacity for waste. When designing products for the Linear Economy, companies aim for volume purchases of raw materials, high-speed manufacturing, and high-quantity sales -- without regard to the product's outcome after use. It's no wonder that electronic waste ("e-waste") has accumulated around the world.

Leading electronics companies are progressing to the Circular Economy, in which they secure mainly pre-used materials, lease or at least take back products, and then upgrade, refurbish, or otherwise renew the products for additional uses. The material retains value and never reaches landfill, such that it does not "leak" out of the economy; it stays inside the circle. Instead of the Linear Take Make Waste model, the Circular Economy is **Borrow, Use, Return**. "Design for the Circular Economy" deploys numerous Eco-Design principles, enabling long-life, swift disassembly, easy upgrades and refurbishment, minimal moving parts (for reliability), and small and lightweight for efficient use, shipment, and take-back.

Figure 1. Circular Economy for Hardware Products



Source: Inspired by the Circular Economy "butterfly diagram" from the Ellen MacArthur Foundation.[2]

Wherever electronic-product companies' first customers are located in the world, the Circular Economy makes sense for extending products' useful life and value. And when products enter developing countries -- either when new or previously used, the benefits of Circular Economy design are perhaps even more essential. Keep the products in economic circulation to delay and avoid e-waste treatment that is hazardous to people and the environment. The executives at all electronic-product companies can direct their business models, product design goals, and continuing connections with customers for both business and environmental benefits.

A roadmap for the electronics industry's migration from the Linear to the Circular Economy is included in the International Electronics Manufacturing Initiative's (iNEMI's) 2017 industry roadmap (Figure 2). Design for the Circular Economy model is a subset of Eco-Design, which includes principles for products' life cycles -- materials, manufacturing, transportation, use, and after-use -- yielding greater reliability, environmental responsibility, and lower costs for both producers and customers. Note that the Circular Economy industry future is described in the table's third row.

Design for the Circular Economy is taught in workshops, comprising the brand company and its strategic manufacturing and refurbishment/recycling suppliers. Typically, the product designers and their managers, along with the suppliers, learn the design principles, disassemble a product to identify ways to improve long-life and economic reuse, and strategize in teams for embedding Circular Economy planning at product concept. Figure 3 is a photo taken at one of these workshops, at a global electronics company based in Silicon Valley.

Figure 3: Design for Circular Economy is taught in workshops.

Case study available.[4]

Deploy Eco-Design to reduce products' power consumption

A key element of Eco-Design in the electronics industry is to ensure that the products require significantly less power and cooling to operate. This Eco-Design principle is essential when selling products *anywhere* in the world, but for two reasons it's especially critical when the products are used in Developing countries:

Figure 2. Roadmap for the Circular Economy in the Electronics Industry, in the context of Eco-Design predictions

	2016	2021	2026	2036
Use of Eco-Design	Deployed by industry leaders	Required collegiate curriculum	Embedded in all processes	Universally applied
Eco-Design Tools	Addressed substances, energy, life cycle assessment	Widely-adopted Eco-Design parameters	Integrated tools across value chain	Designers access full life cycle impacts
Circular Economy	Leaders started to transition	Defined business models, infrastructure	Harmonized requirements	Ubiquitous adoption, eschews linear model

Source: International Electronics Manufacturing Initiative (iNEMI) 2017 industry roadmap, Sustainable Electronics chapter, Eco-Design sub-section.[3]

1) Typically access to power is less reliable. Between load-sharing and other energy challenges, users of electrical and electronic products cannot always depend on the "on" switch to respond. If all products used in Developing countries consumed less power, than the overall load would be lighter on the power infrastructure. As many Developing nations also experience extreme heat, it's vital that electronic products (such as in data centers) remain cool, to operate reliably. Air conditioning consumes a great deal of power, thus designing products that generate less heat and dissipate the heat efficiently without extensive exterior cooling fosters a reliable power grid.

2) Many Developing countries still use coal and other environmentally-compromising energy sources, compared to using mainly clean, renewable energy sources. Thus, designing electronic products to require less and less power and cooling also fosters a cleaner environment.

Designing products to run directly on solar power is another Eco-Design endeavor that can play well in Developing countries that are leapfrogging traditional electric infrastructure in favor of distributed renewable power generation. For example, India's program for solar off-grid and decentralized applications so far has installed 63 solar micro grids of 1899 kWp aggregated capacity (the program has financial support from the MNRE.energy.)[5] More electronic products performing numerous functions -- from air conditioners to "golf" carts -- are designed to be powered by solar collectors.

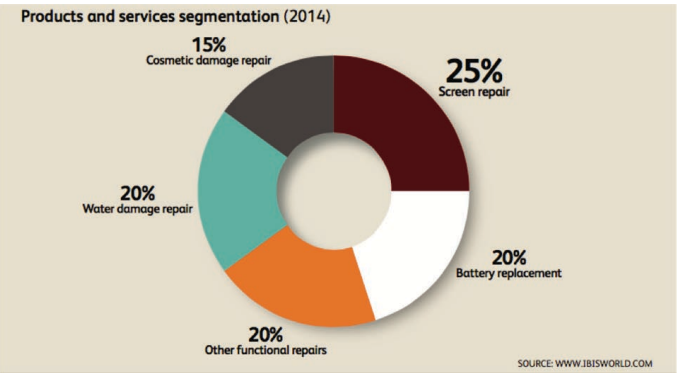
Invest in repair-and-recycling infrastructure where products are used

Coupled with designing products and processes for the Circular Economy is another prerequisite for responsible electronics in Developing Countries: ensuring that the in-country know-how and infrastructure is available for safely and responsibly repairing and recycling products. Infrastructure is essential for fulfilling the benefit of the Circular Economy: economic value and human-and-environmental health. Other benefits include training and steadier jobs for locals.

Companies selling or donating electronic products to people in Developing countries can consider investment in effective reuse/recycling training and infrastructure as part of the "cost of goods sold" or "transportation cost" for such sales or donations. Needed investments are training (skills and safety), protective gear, professional supervision, hand-tools, safe equipment for sorting and processes materials, responsible resale or recycling of hazardous and non-hazardous materials, treatment of effluence, and transportation to and from the reuse/recycling locations.

Note that repairing, refurbishing, and upgrading product is better for the local economy and the environment than recycling. Workers can be trained to fix a variety of products, as listed in Figure 4. When workers learn to repair products, they have more significant and broader skills than when recycling materials alone -- thus boosting the overall capability of the Developing Country's workers.

Figure 4. Electronics Repair and Reuse
Electronics Reuse Conference 2017[6]



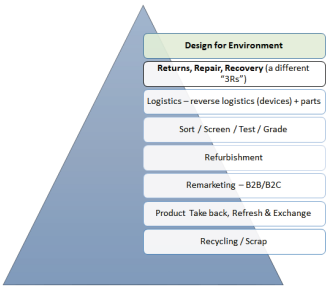
A wonderful example of an electronics company based in the USA investing in recycling in a Developed Country is described in this video: https://www.youtube.com/watch?v=KUopgVC6pok. HP has established infrastructure for residents to collect and process discarded plastic bottles, yielding income for the workers and a material source for HP ink cartridges.[7]

Figure 6. Image of the recycling process used by HP in Haiti. Source: HP Inc., as presented by Judy Glazer, HP, at the May

24, 2018, at the Silicon Valley Leadership Group's Energy & Sustainability Summit, at Oracle, Redwood City, California. Companies can rely on their manufacturing suppliers to facilitate reuse and recycling. Flex, a large global full-service

manufacturer of electronics and other products, facilitates the repair, refurbishment, reuse, and recycling of corporate customers' products, as listed in Figure 7. Flex provides these services in approximately 30 locations global, including in Brazil and Mexico.

Figure 7: Key Services for Circularity in the Electronics Industry, from Flex
Source: Flex[8]



Ideally, safe and economically-feasible reuse and recycling should be conducted in the area of last use of the product. Forethought, training, and infrastructure are required to make this happen reliably and responsibly.

For years, however, Developed countries' product has been shipped to Developing Countries, without investment in safe and responsible treatment methods. For example, as explained by Lou Ramondetta, "Since the 1980s China has eagerly processed shiploads of commodities at relatively low cost. Chinese local officials, however, have raised fees and are sending recyclables to landfills as the economic value erodes. These changes have effectively cut off post-use commodities from the USA, the world's largest generator of product waste."[9] Regulations are being set around the world restricting imports of product waste. The economic and environmental advantages of keeping electronic products in valuable and responsible circulation are increasing.

Strategy for Electronics Used in Developing Countries

Executives at all sizes of electronics companies can start now to improve their levels of responsibility and economic engagement in Developing Countries and all countries. Start by having all product-launch teams trained in designing their products and process for the Circular Economy and Eco-Design. Concurrently, evaluate the reuse/recycling infrastructure in Developing Countries in which their products are shipped, and make investments for the long run.

Pamela J. Gordon is Director of Partnerships at Presidio Graduate School, where she matches sustainability thought leadership to organizations' needs for profitable, responsible solutions..She grew up in Silicon Valley in a family of engineers and backpackers. Early in her career, Pamela founded the consultancy Technology Forecasters Inc., to help electronics companies to build responsible supply chains. Then after the publication of her book *Lean and Green: Profit for Your Workplace and the Environment (link),* she expanded her firm's services to include profitable sustainability strategies. In 2016, she merged Technology Forecasters' with international EHS & Sustainability consultancy Antea Group. She has trained more than one thousand product designers and students in Eco-Design and Circular Economy, and is an award-winning author of books and articles on the intersection of environmental-and-social sustainability and business value. More of Pamela's articles are at https://www.greenbiz.com/users/pamela-gordon .

Pamela J. Gordon

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9. Lou Ramondetta, as presented May 24, 2018, at the Silicon Valley Leadership Group's Energy & Sustainability Summit, at Oracle, Redwood City, California.

Towards an Understanding of the Long-Term Effects of the Gorkha Earthquake on Children's Mental Health

by Jo Anne S. Pandey, Ph.D.

As the third anniversary of the Gorkha Earthquake passes we are reminded of the tremendous toll the disaster took on all levels of Nepalese society. We have a good understanding of how much physical destruction was caused, how much construction has happened, and we are beginning to see evidence of the toll the disaster has caused in economic and social areas. There have been some reports that look at the mental health of adults, but few reports have been published looking at the mental health effects the disaster had on Nepali youth, particularly those living in areas highly affected by the disaster.

Though loss of life, physical injuries, and destruction of property is more outwardly noticeable and easier to quantify, it is important to understand the mental health effects of this disaster for several reasons. Most immediately, mental health issues can interfere with a child's current level of functioning at school, at home, and socially. Furthermore, if the issues persist, they might impede the child's ability to become a fully functional member of society. Mental health problems that are present 6 months following a disaster can persist for 5 years or more without treatment (Le Greca & Silverman, 2012). More specifically, McDermott, Cobham, Berry and Kim (2014) found that 50% of the cases of PTSD that occurred 3 months following a major cyclone had not resolved at 18 months.

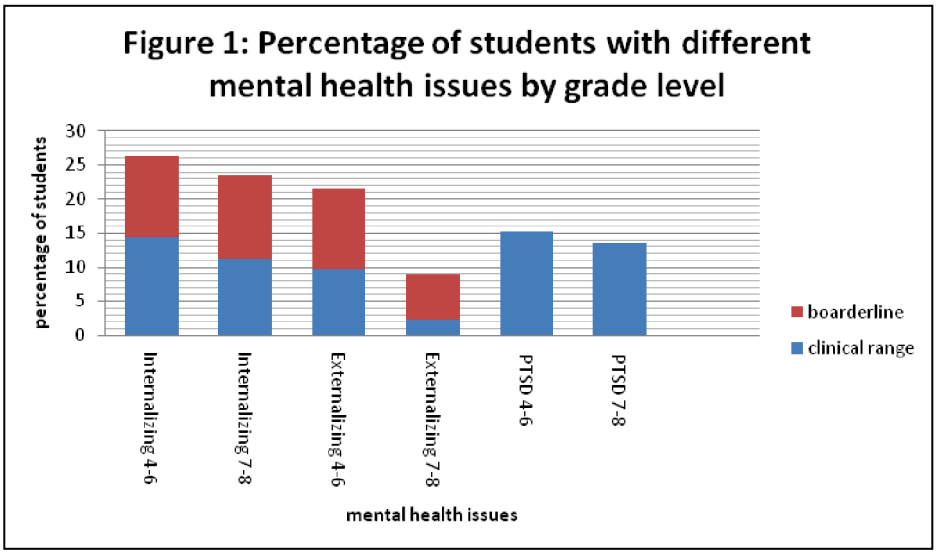
In terms of the Nepalese context the TPO/Red Cross study (2017) found that mental health problems among adults persist, even 18 months following the disaster. They found that 39.4% of adults had depression, 38.4% had anxiety, 25.5% were abusing alcohol, and 16.3% had PTSD. Similarly, Khatri, Tran, Baral, and Fisher (2018) found a 40% rate of depression among pregnant women. Furthermore, 3 separate studies conducted by TPO/Red Cross (2017), the Asia Foundation (2017) and the GIWPS (2018) found that many adults who are socially marginalized and economically disadvantaged are caught in a cycle of despair in which the earthquake caused relatively more damage to their property and livelihoods at the time it happened and the people have had a harder time accessing whatever post-disaster assistance is available due to linguistic, societal, and cultural barriers. The high rate of mental health issues is likely another barrier, but we do not have direct evidence as to how these factors all interact.
One of the biggest effects of children's functioning following a natural disaster is the functioning of adults around them (La Greca & Silverman, 2012). So, it is likely that the rates of mental health issues are quite high among Nepalese youth who live in areas of high impact from the earthquake and marginalized communities. One study looked at the mental health effects on adolescents one year following the earthquake and found that in Sindupulchowk adolescents had a PTSS rate of 39.5% and a depression rate of 40.4% (Silwal et al., 2018).
An understanding of the rate of mental health issues can help determine the resources required to mitigate those problems, and an understanding of what types of mental health interventions are effective can help those who work with children plan effective ways to help children learn to cope with the trauma and loss. Just as we know little about the mental health effects of the Gorkha Earthquake on children, there is also a lack of empirical evidence of the efficacy of mental health interventions, especially ones that are appropriate and valid for the Nepalese context. In 2017, I started a small study which aimed to answer both of those questions.

The study took place in a rural area in the Gorkha District. Three community schools that serve primarily economically and socially marginalized communities were selected to participate. Approximately 215 students in grades 4 to 8 participated in all phases of the study. Teachers at all schools were trained to use the Teacher Report Form of the ASEBA (Achenbach and Rescorla, 2001) and asked to complete forms for children that they knew well at the beginning of the study. The TRF was chosen because it has scales for general functioning, and for many specific issues such as depression, somatic symptoms, externalizing, and PTSD and also because the measure had already been translated into Nepali and validated with a Nepalese sample. These served as the baseline psychological assessments.

Teachers in the intervention schools were given additional training in the use of writing therapy in their classrooms and then asked to conduct ten 15-minute sessions of writing therapy with their students over the course of 3 months. The writing therapy that was used was a combination of traditional writing therapy, and additional prompts which were designed specifically for the current project. Teachers in all schools were asked to repeat the psychological assessment after three months as a post-test. Following the post-testing, teachers in the control school were also trained in writing therapy so that they could use it with their students if they desired.
Figure 1 shows the percentage of students who were found to have several different mental health issues at the time of the baseline tests. Figures for students in grades 4 to 6 and grades 7 to 8 are given separately. Internalizing problems are those in which a person's problems are directed internally (e.g.,

depression, anxiety, somatic symptoms) and externalizing problems are those in which problems are directed towards others (e.g., aggressive behavior). Rates of most issues are lower for children in this sample than they were for the adults from the TPO/Red Cross study with the exception of PTSD, which is comparable to adults. Our figure for PTSD is conservative, because the TRF instrument we used has been shown to under-identify the number of cases of PTSD in a population (You, et al., 2017). Furthermore, the rates are much lower than those of the Silwal et al. (2018) study for hill populations. This is likely a result of different methodologies because the Silwal et al. (2018) study used self-report measures and it is unclear whether these were translated into Nepali or what the validity of the instruments used are in Nepali hill populations. We are likely under-reporting, and it is likely that the other study had over-reporting.

Differences between the results in various studies could be caused by: a) differences in populations sampled, b) amount of damage sustained in those populations, c) rebuilding efforts (the schools in the current sample all had some degree of reconstruction at the time the data was collected), d) different effects for children and adults, e) spontaneous improvements in mental health, or f) methodological differences. Teacher reports were used in the current research, and they might not have access to all of the important information about the children. Furthermore, because we used the schools for recruiting, we might have missed children with the highest levels of mental health issues, because they might have stopped attending school. Many of the above problems indicate that is possible that we have under-identified mental health issues.



Effects of Writing Therapy: Preliminary Analyses

Twenty-one students who participated in writing therapy had PTSD scores above the cut-off of 8. Seventeen (81%) of them decreased their scores on the PTSD scale between the pre-test and the post-test, and 10 (47.6%) of them decreased to below the cut-off. Only two students remained the same, and 2 had a slight increase in scores.

It appears from these initial analyses that the writing therapy intervention was successful in helping to decrease PTSD symptoms. We are still in the process of analyzing the results from the control school which will provide more evidence as to whether the intervention was helpful in decreasing the symptoms or whether it was due to some other factor such as time.

Qualitative analysis of the journals written by the students will give us further insight into how and why writing therapy might be helping these students. A preliminary analysis of the 5th grade and 8th grade journals revealed some important themes. Several students in 5th grade discussed their experiences during and after the earthquake. For instance, one 5th grader said,

"On the 25th of April the earthquake happened. I was with my mom herding goats. I got really scared. Our house was cracked and I got really scared. A lot of people were hurt. A lot of people died. When I heard that, I felt really sad. I was scared to go home. We slept outside in the tent."

Many students discussed the heavy burden of poverty in their lives. They discussed issues surrounding not having school supplies and footwear, the need to fix/build houses, conflicts over money, and physical danger associated with living in a remote area with few resources.

Furthermore, students discussed conflicts with friends and parents or guardians. Several children wrote that their parents would yell at them or hit them for no reason. This might be because during adolescence there can be a temporary decrease in the ability to accurately interpret adult expressions of emotion, or it could be because the adults were coping with mental health issues of their own.

Another important theme of the writing was the desire of so many students to become an important person (thulo manche). They indicated that they wanted to become a thulo manche to help their village, community, and country and to make people proud. Students wrote that school, learning, and particularly concentration is a big

part of this, and at the same time indicated that they were having issues with being able to concentrate and learn in school.

This qualitative analysis shows that these students' descriptions of village life post-earthquake are consistent with descriptions of adults' lives. The Red Cross/TPO study (2017) found difficulties in coping from adults, including difficulties in concentrating and increased interpersonal conflicts. Another area of consistency is in the positive role of talking with others to help solve problems and cope.

These initial analyses show some indication that engaging in writing therapy helped students to cope better. If 1 in 7 children are still suffering from PTSD in the high earthquake affected areas of Nepal, this is something we need to remedy. How will students be able to reach their dreams of becoming a thulo manche, escaping poverty, and bringing their community along with them if they are also suffering with mental health issues? Asking teachers to take 15 minutes out of class for 10 class periods is a small ask if it could lead to helping 80% of those students who are suffering.

These are still preliminary analyses, we do not have results from the control school yet. Our sample was in an area accessible mostly by vehicle, so we do not know if these findings would generalize to more remote populations, or if the instances would be higher there. We do not know if the mental health issues were caused by the earthquake or something else because gatekeepers would not allow me to bring up the issue of the earthquake with the students.

However, a picture of the long term mental health effects of children and adolescents who survived the Gorkha Earthquake is starting to develop. We can see lingering mental health issues, and we can see evidence that a relatively low cost and easy to implement intervention can be effective in reducing the symptoms of PTSD. Policy makers and other stakeholders can use this information to help them decide how to continue recovery efforts, and to plan for disaster recovery in the future. Similarly, other natural disasters that hit Nepal are likely to have similar effects on children and adolescents and this information could be helpful in guiding recovery efforts in areas affected by other natural disasters such as the flooding in the Terai. Furthermore, the exercise could be helpful for a general population to help students who are having emotional/psychological issues as well. One eighth grade student wrote a note following her last journal entry, "Thank you – Through this writing therapy I was able to express many of the things I was keeping in my heart. So, I want to thank you very much for this opportunity."

It is hoped that other students in Nepal can have this opportunity as well.

Jo Anne S. Pandey first went to Nepal in 1992 with a studyabroad program through Pitzer College. After graduating from Pitzer College with a B.A. in psychology and anthropology,she went on to the University of Hawaii's at Manoa for her M.Ed. in educational psychology with a thesis about differencesin attributions of Hawaiian and Nepalese children. Jo Anne received her Ph.D. in psychological studies in education from the University of California, Los Angeles (UCLA) in 2003. Upon returning to Los Angeles, Jo Anne has been active in the Nepalese community there. She was one of the founders and the first president of Friends of Nepal, Los Angeles. She currently is teaching at California State University, Northridge in the Child and Adolescent Studies department and is conducting research on the effectiveness of using writing therapy in Nepal as well as researching the effects that visits by authors of children's books have on the motivation of elementary students to read, write, and revise.

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Protecting Emergency Networks During Disasters

by Rakesh Bharania
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When a magnitude 8.2 earthquake struck the country of Nepal on April 25, 2015, one of the first things to be affected by the disaster was the telecommunications infrastructure. With communications in the affected area crippled, it was a challenge for local authorities to coordinate a response to the quake, for survivors to connect with loved ones, and for the outside world to understand the magnitude of the catastrophe and the required humanitarian aid.

The response to modern disasters is extremely data-driven. Essential command-and-control, logistics, and situational awareness requires the collection, analysis and dissemination of numerous bits of information. Aid workers and rescue teams will bring laptops, cell phones, radios, printers, and all of the other ICT technologies one would expect of a business to the field. Fortunately, since the 2010 earthquake in Haiti, the international humanitarian community had become adept at establishing emergency connectivity in the first hours of a crisis.

The concept of the Hastily Formed Network (HFN) was first defined by the US Naval Postgraduate School in the early 2000s. First deployed during Hurricane Katrina in the United States, HFNs are interim satellite-based emergency networks that deliver Internet connectivity to essential rescue and recovery personnel in the earliest hours of a crisis. Since their debut in 2005, HFNs were used in major emergencies such as the 2011 quake in Japan and during the response to Super Typhoon Haiyan in the Philippines in 2013. In addition to their use in Nepal, HFNs have more recently been used during the Syrian Refugee Crisis in Europe and most recently in Puerto Rico after Hurricane Maria struck in 2017. Because of the important life-saving work that HFNs support, it is therefore essential that this infrastructure (and the associated user devices and data) be protected from the loss of confidentiality, integrity or availability from misuse or deliberate attack.

While digital attacks have been documented previously during other HFN deployments, what made the Nepal disaster unique was that for the first time, there was evidence of a government-level attacker. The international NGO NetHope deployed its first HFN within the first 72 hours of the earthquake at the Humanitarian Staging Area (HSA) in Kathmandu. This network was used by numerous rescue and aid personnel as they arrived in Nepal, but before they headed out into the field. Unlike many previous HFN deployments with poor monitoring and threat mitigation, this particular network had advanced intrusion detection built-in. Within a few days, the network sent alarms indicating that a sophisticated type of Windows malware known as “TeamSpy” had been detected on devices belonging to a major aid agency. According to Kaspersky Lab, TeamSpy was believed to be a remote access malware that was specifically targeting activists and government officials and was believed to be originated “by an Eastern European country.”

Disasters: Where High-Security Risk Meets Low Capacity

While we can clearly see that information security is an important part of the technical response to a crisis, the reality is that right now many well-meaning organizations poorly control those risks. Emergency technical teams belonging to the NGO community, the private sector, or international organizations such as the United Nations are typically focused on establishing necessary infrastructure as quickly as possible due to the time-sensitive nature of a humanitarian crisis. But they often lack the field capability to detect sophisticated threats or to respond and mitigate any threats that may emerge. It is the worst of both worlds: a situation where security is incredibly important, because compromise may endanger the mission or people, yet the ability to detect and respond is lacking.

Fortunately, recent advances in network security technology mean that adequate protection for HFNs is both practical and cost-effective for low-resource crises. To adapt the security technologies commonly used by businesses for the humanitarian crisis use case, it is helpful to understand what makes the context different in a crisis. For example, it is quite common in a humanitarian crisis for aid workers to arrive with any number and type of device. These devices, in turn, may or may not have recent security fixes or anti-virus protection, as they're typically not managed in the same way similar devices would be in a large business. Technical information security expertise is often lacking, as is the ability to detect and report on suspected malicious behavior. Incident response protocols are often lacking in a crisis such that even if an attack were immediately apparent to the user community (such as a ransomware attack that took over the user's screen and prevented normal operation), teams would be unlikely to effectively and comprehensively respond to the attack in a systematic, repeatable fashion. Lastly and perhaps most importantly, any sort of technical security in a humanitarian crisis exists in the broader context of the crisis itself. When the core mission is to save lives in the immediate aftermath of a disaster, sometimes with the ongoing physical hazards of armed groups, aftershocks or other life-threats, it becomes pretty easy to see how information security might be low on the priority list.

Network Security For Emergencies: A Layered, Automated Approach

No single security technology or product can control all risks. So one of the first fundamental design principles is the concept of defense-in-depth. Multiple technologies and multiple points of control mean that while a threat may be able to overcome one or several controls, it's less likely to overcome all controls.

Advanced Firewalls - Traditional "stateful" firewalls are typically inadequate for today's threat landscape. Next-Generation Firewalls (NGFWs in industry parlance) are firewalls that build upon the stateful firewall model with additional application-level (OSI Layer 7) awareness and policy enforcement.

Intrusion Prevention - Modern intrusion prevention systems offer protection via attack signatures (identified behaviors of known attacks), as well as anomaly detection (risk profiling based on anomalous behavior which may indicate a novel or previously unknown attack method). Tied to machine learning in the cloud, modern IPS systems continually learn about the latest threats in near real-time, allowing the IPS system to dynamically learn about a new threat and how to block it without human intervention, such as the manual updating of attack signatures.

DNS-based security - Normal DNS service typically provided by Internet Service Providers (ISPs) will resolve any domain queried. This has lead to the use of Domain Generation Algorithms (DGAs) used in malware to use DNS to obfuscate the command-and-control (C2) channels used by modern malware. To combat this, DNS-based security protection such as that offered by Cisco or CloudFlare is available that uses a combination of human analysis and machine learning to identify malicious domain names. When a device queries for one of these malicious names, the DNS service fails to resolve the name to an IP address, thereby blocking or containing malware from contacting its back-end C2 systems.

File sandboxing - Downloads of apps and other executable files can be checked against the signatures for known malware within an IPS system. In essence, this provides a level of anti-virus checking in the network, instead relying entirely on the end-user device for malware detection. File sandboxing, on the other hand, builds on this capability by being able to examine the behavior of previously unknown executables. If a device downloads an executable file on the network, that file can be compared against a database of known files. If the file's behavior is unknown, sandboxing allows the file to either be examined using machine learning within the firewall's memory or out in the cloud, to determine its behavior. If the checks determine that the unknown file is benign, the download is allowed to proceed to the end user. If, on the other hand, the unknown file is determined to be malicious, the download can be blocked, preventing the file from reaching its target.

Quality of Service Management - Most networks in crisis response consist of "dumb pipes," which are network links without any policy or traffic shaping applied. Quality of Service

(QoS) is an essential tool to ensure that mission-critical traffic gets through, but it is also a useful security tool to ensure that certain types of traffic (such as operating system updates, or video) do not overwhelm limited network resources and create denial-of-service conditions.

Remote Management and Reporting - In addition to the technical capabilities listed above, there also needs to be active monitoring and response to actual or suspected security incidents on the HFN. Because security knowledge and expertise are often lacking on-the-ground, organizations may consider establishing Security Operations Centers (SOCs) that are remote to the disaster. This allows a centralized team of security experts to monitor the health and security of the network, respond to any alarms, and initiate response protocols even as they are remote to the incident. This has the double benefit of allowing an organization to scale their limited security expertise as SOC staff can simultaneously monitor multiple field sites, or even sites across multiple incidents while remaining safely away from any hazards on the ground. Additionally, this model of monitoring doesn't necessarily require local staff to routinely divert their attention from other essential activities on the ground. The SOC can monitor and assure ongoing operations, and only if an incident requires local intervention does the local staff need to be involved.

The Threats Evolve, So Must Protection

It is a given that malicious actors will continue to innovate and refine attack methods. These attacks can severely hinder a humanitarian response mission. So humanitarian network security must continually evolve as well. The various security capabilities described in this article heavily rely upon machine learning and artificial intelligence to identify malicious behavior in addition to human analysis, allowing for an agile security posture on the ground that is physically lightweight and easy to deploy, and will enable responders on the ground to spend the majority of their time on essential humanitarian and life-saving activities while safely realizing the productivity and situational awareness benefits of technology.

Recent disasters have demonstrated that these advanced network security architectures are both practical to deploy, and effective at stopping malicious threats, even when those threats deliberately target the humanitarian response community.

Rakesh Bharania

Rakesh Bharania is President of Tarian Innovation, a humanitarian innovation and advocacy organization focused on the ethical and secure use of technology to support vulnerable crisis-affected populations.

He has had more than 25 years of field experience on the ground during major global humanitarian emergencies, most recently as a leader with the Cisco Tactical Operations team, an innovative private-sector humanitarian initiative that has delivered secure connectivity to over a million aid workers and crisis-affected people around the world. He has architected and deployed networks and advanced data protection in support of numerous emergencies, including the Syrian Refugee Crisis, the Ebola Crisis in West Africa, Super Typhoon Haiyan, Hurricane Sandy, the Haiti earthquake and Hurricane Katrina. Rakesh has served as the chairman of the Global VSAT Forum cybersecurity task force, and the co-chair of the NetHope Security and Privacy Working Group. He is currently an advisor to the Do No Digital Harm initiative, the world's first on-call, deployable team mandated to address the ethical, security, and design challenges faced by humanitarian actors in the Digital Age.