Proceedings of the 2009 Humanitarian Logistics Conference

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Program Committee:
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These proceedings are intended to summarize and convey the information presented at the 2009 Humanitarian Logistics Conference. The information presented herein does not constitute an official recommendation for particular scenarios arising in practice.

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Section 1: About This Event

Natural and man-made disasters swept through various parts of the world and received much attention over the past decade. Many parts of the world also suffer from the lack of basic necessities, including shelter, water, food, education, access to basic health care, and safety, identified in "humanity's top 10 problems over the next 50 years."[1] The 2009 Humanitarian Logistics Conference, held February 19 – 20 at the Georgia Institute of Technology in Atlanta, focused on topics relevant to planning, preparing, and responding to disasters, long term development, and health efforts.

Given the complexity of the problems faced, the main objectives of the conference were to:

- articulate the opportunities and challenges in preparing for and responding to disasters or addressing long term problems, both from a humanitarian and a corporate/economic perspective,
- identify important research issues,
- create academic awareness for the research opportunities, and
- establish priorities for non-governmental organizations (NGOs), corporations, and the government in terms of their strategies, policies, and investments.

The conference brought many stakeholders together for shared learning and goal-setting relevant to some of the world's most pressing problems. This document summarizes the major themes and outcomes of the conference, which was attended by over 180 people from academic, governmental, corporate, and non-governmental organizations.

The 2009 Humanitarian Logistics Conference (HumLog'09) was co-chaired by Drs. Özlem Ergun, Pinar Keskinocak, and Julie Swann, co-directors of the Research Center for Humanitarian Logistics at Georgia Tech. The vision of the research center is "to improve humanitarian logistics (including short or long term, manmade or natural disasters) and ultimately the human condition by system transformations through education, outreach, projects, and research."[2] Since its establishment in 2007, the center has built a broad network of stakeholders in humanitarian logistics worldwide. Barbara Christopher, Anita Race, Harry Sharp, and Monica Villarreal served on the conference committee. HumLog'09 was supported in part by the National Science Foundation, the Georgia Tech College of Engineering Focused Research Program, the Harold R. and Mary Anne Nash Junior Faculty Endowment Fund, the H. Milton Stewart School of Industrial and Systems Engineering, the Georgia Tech Supply Chain and Logistics Institute, and the Georgia Emergency Management Agency.

To access presentation slides, speaker biographies, and other conference information, please visit the conference website at http://www2.isye.gatech.edu/humlog09/.

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[1] Smalley, Richard (2003). "Top Ten Problems of Humanity for the Next 50 Years," *Energy and Nanotechnology: Strategy for the Future Conference*. Rice University, May 2003.
[2] http://www.scl.gatech.edu/research/humanitarian/

Section 2: Executive Summary

The 2009 Humanitarian Logistics Conference at the Georgia Institute of Technology brought together humanitarian practitioners and researchers from around the world. Non-governmental organizations, government agencies, private companies, and academic institutions were represented. In addition to panel discussions highlighting major themes in this field, skill-building workshops and poster sessions allowed participants to interact with one another and share ideas to continue to improve their own organization's efforts. The conference proved valuable to attendees: more than 90 percent indicated that they would recommend the conference to a colleague and that they would attend a similar conference in the future.

The conference themes focused on disaster planning and response, long term development, and collaboration within and between organizations. There were several messages for participants going forward from the conference.

- The challenges in humanitarian logistics are great:
  - The number of people vulnerable to disaster is increasing.
  - Limited resources and infrastructure exist to address needs.
  - High uncertainty and urgency characterize response efforts.
  - Multiple stakeholders, often with differing objectives, act in each operation.
- There are many opportunities to improve humanitarian efforts:
  - Metrics are needed to assess performance, guide decisions, and improve operations.
  - Collaboration among stakeholders has the potential to greatly impact outcomes, but it is difficult to achieve.
  - Standards across the sector in terminology, technology, and practice could improve efficiency.
  - Logistics has been shown to make a difference both in immediate response and in long term development.

These messages have been gleaned from the conference sessions and discussions, and further details are discussed in these proceedings. The remainder of this document is organized as follows. Sections 3 – 5 contain summaries for the panel sessions, Disaster Preparedness, Response, and Post-Disaster Operations; Long Term Development and Humanitarian Aid; and Intra- and Inter-organizational Collaboration in Disaster Planning and Long Term Humanitarian Aid, respectively. A summary of the plenary talk, which focused on World Food Programme operations, is given in Section 6. The outcomes of focused lunch discussion groups are highlighted in Section 7, while Section 8 describes the conference's poster session. Section 9 contains information about the interactive workshop sessions. Concluding remarks and directions for future work are presented in Section 10.

Section 3: Disaster Preparedness, Response, and Post-Disaster Operations

Session Presenters:
- **William "Eric" Smith**, *Assistant Administrator, FEMA Logistics Management Directorate*
- **Rosemary Parnell**, *Director of Field Logistics, American Red Cross*
- **Bert Thornton**, *President of Franchise Operations, Waffle House*
- **David Gazashvili**, *Deputy Director and the Senior Advisor, Emergency and Humanitarian Assistance Unit, CARE USA*
- **Roland Tomasini**, *Research Group Leader, INSEAD Social Innovation Center's Humanitarian Research Group*

Moderator: Nancy Brockway, *Chief Emergency Services Officer, Metropolitan Atlanta Chapter of the American Red Cross*

The opening panel of the conference focused on challenges and successes in disaster preparedness, response, and post-disaster operations. Panelists represented the perspectives of government agencies, non-governmental organizations, the private sector, and academia, with interests both domestic and international.

William Smith of the Federal Emergency Management Agency (FEMA) talked about logistics transformation at FEMA post-Hurricane Katrina. FEMA is the national agency charged with managing emergency events of all types nationwide.

The organization has undergone substantial change in recent years. The transformation includes a redefinition of FEMA's logistics management function, mission, and focus. FEMA's role as the national logistics coordinator during any type of emergency has been more clearly defined. The agency is changing logistics business practices towards a strategic capability focus, with continuous assessment and process improvement. There is also improved collaboration with local and state governments, extensive pre-incident planning, and close partnerships with NGOs and private sector. FEMA's strategy focuses on its people, customers, systems, and processes as enablers to face their current challenges.

Rosemary Parnell highlighted the breadth of services provided by the American Red Cross. The organization's mission includes disaster response, blood services, health and safety education, services to the armed forces, and international services. Parnell discussed the logistics system that enables the agency to conduct these activities.

Two of the primary responsibilities of the American Red Cross in responding to a domestic disaster are feeding and sheltering. The agency is capable of giving shelter to five hundred thousand individuals, deploying one million meals within 72 hours sustained for 30 days, and mobilizing a staff of four thousand volunteers. National Headquarters procures and replenishes disaster supplies, while the Disaster Relief Operation (DRO) procures for a particular disaster. Additionally, in-kind donations come from private industry, individuals and governments. The DRO ensures donations are used properly and donors are recognized. Inventory is managed in the more than 1.2 million square feet of warehouse space. Trailers are also used for pre-positioning supplies in hurricane zones. Parnell also discussed performance metrics that the

agency uses to track and improve its efforts. Measures used by the American Red Cross include a 24 hour window from requisition to supply delivery and keeping supply losses below two percent.

Waffle House Restaurants has been recognized as an outstanding disaster responder, together with companies like Wal-Mart, Home Depot, and Lowe's. Bert Thornton described why the restaurant company has earned this recognition. Thornton explained that even if it is easier for companies and businesses to close and wait for the situation to stabilize after a disaster such as a hurricane strikes, there is an obligation to provide assistance to the customers and associates during the difficult times. "Nothing good comes from a closed Waffle House," he said.

Waffle House Restaurants, with locations in states within the hurricane belt such as Georgia, Louisiana, Alabama, Mississippi, and Texas, has a program for hurricane response that includes extensive hurricane preparation activities. These include preparation meetings, best-practices documentation and process manuals, and staff and equipment preparedness activities. This preparation supports direct response in the field in the event of a hurricane. In fact, after Hurricane Katrina, Waffle House teams were among the first delivering relief, and among the few businesses opened providing their services to the community, volunteers, and military personnel.

CARE International has offices in countries worldwide, and the organization's mission is to help people improve their lives by providing economic opportunities, strengthening self-help capacity, influencing policy, and delivering relief in emergencies. David Gazashvili talked about CARE's work and the ways that the agency measures their performance.

The CARE strategy for disaster relief includes building local capacities, achieving adequate levels of readiness, and working together with partners. The organization measures performance in several ways. Timeliness of response, quality, and accountability are important metrics. In addition, the organization focuses on competence in CARE's core sectors, which are food, shelter, water and sanitation.

Roland Tomasini is the research group leader of the INSEAD Social Innovation Center's Humanitarian Logistics Research Group. The primary focus of this group is to develop a science of humanitarian logistics that facilitates learning between the private sector and humanitarian organizations.

Tomasini discussed humanitarian supply chains and their challenges. These challenges are numerous. Among them are ambiguous objectives since is difficult to assess and integrate the efforts of different stakeholders; limited resources with high staff turnover; limited, damaged or inexistent infrastructure; and reactivity of the funding mechanisms. In addition, humanitarian supply chains face high uncertainty with changes in supply and demand. They operate under great urgency and high levels of intensity, often in politicized environments. The INSEAD Social Innovation Centre brings together academic expertise to develop solutions that respond to these challenges.

General Conclusions

- Humanitarian logistics is challenging for many reasons
  - Each disaster is different, leading to episodic logistics systems in contrast to regular supply chains.
  - Resources and infrastructure are limited, damaged, or non-existent.
  - There is mixed sourcing of resources and lack of visibility of supply pipelines.
  - Demand and supply are highly uncertain.
  - Operations carry a high level of intensity and urgency.
  - Coordination of NGOs, federal government, local and state authorities, private industry and communities involves a large number of the players making urgent decisions. It is also difficult to assess the level of commitment among the different actors.
  - Environments are often highly politicized and actions are very influenced by public perception.
- Even though every disaster is different, a strategic response model may be developed for the different types of disasters, serving as a starting point, and then be adapted to the specific situation as a response plan.
- Different disaster types might have very different response strategies. For example, for disasters like hurricanes, floods or earthquakes, relief operations focus on delivering food, shelter, water, and hygiene as fast as possible. However, in the case of slow onset disasters there should be a comprehensive root cause analysis before any decision is taken to the field.
- Although timeliness of response is crucial while responding to a disaster, accountability must be maintained to ensure sustainability of the operations. Preparedness and adequate process definition could help to achieve accountability without affecting the responsiveness of the humanitarian supply chain.
- Performance measurement is extremely important in humanitarian operations. A performance assessment should include timeliness and speed of the response, quality of the response, cost, and accountability metrics.

Section 4: Long Term Development and Humanitarian Aid

Session Presenters:
- **Bob Emrey**, *USAID, Chief of Health Systems Division, Office of Health, Infectious Diseases, and Nutrition, Bureau for Global Health*
- **Santosh Vempala**, *Distinguished Professor of Computer Science, College of Computing, Georgia Institute of Technology*
- **William Hyde**, *International Medical Corps, Director of Operations and Knowledge Management*
- **Nathaniel Hupert**, *Director of Preparedness Modeling Initiative, Centers for Disease Control and Prevention, and Associate Professor of Public Health and Medicine, Cornell University's Weill Medical College*

Moderator: Michael Best, *Assistant Professor, Sam Nunn School of International Affairs and School of Interactive Computing, Georgia Institute of Technology*

The second conference panel focused on long term development, including the relationship between immediate disaster response and continuing development efforts. Common themes that emerged during the discussion included the importance of development efforts in reducing vulnerability, and thus some of the need for future relief efforts, as well as the notion that it is never too early to begin development efforts even while immediate response is still underway.

Bob Emrey of USAID discussed the agency's mission in development and aid. USAID is the government agency charged with providing humanitarian relief on behalf of the American people. Its scope includes improving emergency preparedness and disaster mitigation; providing emergency assistance in the form of personnel, commodities, and funding; and protecting and increasing the food security of vulnerable populations.

Emrey described the long term development efforts of USAID in Liberia, a country in which the first lasting peace in two decades was established in 2003. One million people had been displaced and there were over 250,000 casualties in the unrest. The country is currently transitioning from disaster relief to long term development.

Logistics plays a key role in helping the USAID meet significant challenges in response and development in the near future. The Millennium Development Goals seek substantial reduction of child mortality, improvement in maternal health, and reduction of HIV/AIDS, malaria, TB, and other diseases. Developing and delivering the medical products, vaccines, and technologies needed to achieve these goals requires logistics expertise.

The International Medical Corps is a nonprofit humanitarian organization focused on health care training, relief, and development efforts worldwide. One of the agency's chief objectives is to increase local capabilities to respond to local needs. William Hyde's discussion focused on recent trends in humanitarian aid and development that have made this goal increasingly important.

In recent years, there has been a disturbing increase in the number of societies identified as vulnerable. With only partial recovery in many areas, agencies continue to find more societies in need. An old pattern of short-term relief efforts followed by clear turnover to local people has been replaced with drawn-out efforts without a clear end. Struggle exists between relief and development efforts, especially in the areas of developing national capacity and in identifying a culturally-appropriate response.

Hyde discussed three potential solutions that humanitarian agencies have to mitigate these trends: get larger, get smarter, or grow national capacity. He described getting larger as the last choice, emphasizing that there are already duplications and inefficiencies in effort. Getting smarter is part of the answer, but to do this several challenges must be overcome. Among these are the fact that existing supply chain management software is often proprietary, without support for translation across agencies and applications. In addition, the sector is getting better at stove piping, but needs logistics software packages that talk to each other and help agencies meet individual donor requirements. Desirable features of such solutions include an on-location all-commodities database for agencies, with common item descriptions and identification codes, as well as commodities packaging and other response components that fit cultural norms. Hyde concluded by reiterating that the growth of national capacity to address humanitarian crises is the most important solution to prevent or meet the increasing need for assistance.

Santosh Vempala is a Distinguished Professor of Computer Science and Director of the Algorithms and Randomness Center (ARC) at Georgia Tech. His research interests are in algorithms, randomness and geometry and their applications. Since 2007, he has been studying how computers can create sustainable societal benefits. He co-taught "Computing for Good" in 2008 and has four ongoing projects in this space: a scalable blood monitoring system for developing countries, a homeless housing occupancy system for Atlanta, a partnership with Operation P.E.A.C.E., an after school program in the old fourth ward, and a promising new protocol for mobile wireless networks. His comments focused on the blood monitoring system.

Vempala described the development of a web-based monitoring system for blood safety. The challenges that arose in the project included designing a system that could be used with low bandwidth, was accessible to individuals with limited training, and that could be applied in many cultural settings. The system was developed by Georgia Tech graduate students and faculty and then tested in Zambia. On January 1, 2009, the system was deployed in all 14 PEPFAR (President's Emergency Plan for AIDS Relief) countries and the World Health Organization plans to use the tool for worldwide blood safety reporting.

This project led to other research questions about matching scarce resources with demand efficiently and fairly. Vempala emphasized that computing for developing regions leads to important research directions to address resource scarcity and other new constraints. Much work remains to be done to ensure that the benefits of computing contribute to development efforts.

Nathaniel Hupert is an Associate Professor of Public Health and Medicine at Cornell University's Weill Medical College and Associate Attending Physician at New York-Presbyterian Hospital, and is the director of the new Preparedness Modeling Initiative for the U.S. Center for Disease Control and Preparedness (CDC). The scope of the CDC Preparedness Modeling Initiative is

very broad and includes questions such as hurricane path prediction, vector biology, drug resistance, vaccine effectiveness, chemical or radionuclide attack preparedness, and models to inform planning and response for other natural and man-made events.

Hupert's discussion focused on the role of modeling in preparedness and the need to connect modelers to the end users of those models. Explaining that preparedness experts often think that modelers want to take away their jobs, he discussed the steps to creating models that will be useful in practice. The first step does not involve a computer, but instead reaching out to the end users. This also helps ensure that the model is based on a real decision that practitioners need to make: "Every decision is based on a model, but not every model is based on a decision." Hupert explained that modeling enables decision makers to gain insights into the mechanisms at work in a particular scenario and to focus their thinking, but that the model alone does not give the answer.

General Conclusions
- Relief and development are intricately linked, with opportunities for synergy and instances of conflict between the two.
  - o Shortage of human resources and limited local capacity create barriers to progress in both relief and development.
  - o Transparency, common language and standards across the sector, and coordination could help realize synergies between relief and development efforts.
  - o Sometimes funding is prioritized for relief or immediate efforts with little long-term focus.
- Both relief and development must be culturally appropriate. For example, USAID finds it critical to connect immediately and regularly with the local medical community. Vempala's Georgia Tech blood donation project team spent a great deal of time designing the user interface and asked non-project related questions to assess accuracy of understanding about the system. Cultural considerations extend from the onset of response, through appropriate relief item packaging, to the completion of agencies' long-term development support in ensuring that solutions fit local norms.
- Efforts to understand how to develop useful models to support preparedness decision making can improve both response and long-term development.

**Section 5: Intra- and Inter-organizational Collaboration in Disaster Planning
and Long Term Humanitarian Aid**

Session Presenters:
- **Michael Marx**, *Senior Civil Military Coordinator Advisor, UN Office for the Coordination of Humanitarian Affairs (OCHA)*
- **Becky McCorry**, *Manager, Disaster Operations Center, American Red Cross*
- **Prashant Yadav**, *Professor of Supply Chain Management, MIT Zaragoza Logistics Center*
- **Richard Owens**, *Vice President, The Partnership for Supply Chain Management, John Snow Inc.*

Moderator: Leigh Fitzpatrick McCook, *Division Chief, Socio-Technical System Division, Information Technology and Telecommunications Laboratory, GTRI*

The final panel emphasized opportunities and challenges in fostering intra- and inter-organizational collaboration, both for disaster planning and long term humanitarian scenarios.

The Office for the Coordination of Humanitarian Affairs (OCHA) is the United Nation's focal point for civil-military coordination in humanitarian operations. The agency's mission is to mobilize and coordinate the efforts of national and international stakeholders to provide effective humanitarian response. Michael Marx discussed how civil-military coordination relates to OCHA's mission and today's global environment.

Marx pointed out that there are over 25 million people in need of assistance today due to conflicts, and many more due to natural disasters. There are many international and national key actors in disaster response, from the Red Cross, UN agencies, and international NGO's to the national military, local businesses, and the affected population. Humanitarian civil-military coordination must protect and promote humanitarian principles, avoid competition, minimize inconsistency, and, when appropriate, pursue common goals. The military is playing an increased role in relief operations, and the humanitarian community is increasingly accepting of an appropriate military role in assistance operations. The military has several advantages, including proximity, military assets and technologies, and understanding of local characteristics. OCHA is seeking to engage with the U.S. military, which in particular can fundamentally change the nature of a response operation due to its global positioning and capacity for rapid response. Some of the key challenges in civil-military coordination, Marx explained, are the tradeoffs between principles and pragmatism, timeliness of decision making, efficiency, coordination between different actors, and costs. Meeting these challenges is central to OCHA's operations.

The American Red Cross coordinates with many other organizations in the execution of its operations. Becky McCorry discussed these relationships, the challenges in cooperation, and the practices that the American Red Cross uses to ensure effectiveness.

The partners of the American Red Cross include federal government agencies, such as FEMA, state and local governments, the United States Northern Command (NORTHCOM), and the US Department of Agriculture. Red Cross also works with other non-governmental organizations,

such as Salvation Army, Catholic Charities, Southern Baptist Convention, United Methodist Committee on Relief, NAACP, and Legal Services Corporation. The American Red Cross believes in collaborating at all levels and engaging local people and those affected during recovery. As McCorry pointed out, "All disasters are local." ARC is focused on local capacity building, recovery planning and assistance, and evaluation and planning. The key challenges in interactions between organizations are coordination, cooperation, communication, collaboration, and change management.

Prashant Yadav, professor of supply chain management at MIT-Zaragoza's International Logistics Program, discussed how inter-organizational coordination can positively impact global health supply chains. He described supply chain mechanisms that can help alleviate the inefficiencies that contribute to poor health outcomes for populations worldwide.

As examples of the severity of the global health crisis, he pointed out that almost one-third of the world's population does not have access to essential medicines, and around 10 million children under the age of five die due to lack of simple and affordable healthcare. A very complex system is used to finance health commodities for low income and less developed nations. Drugs and financing come from drug manufacturers and international financiers, flow through private, public and NGO buyers, and finally arrive to the end patients. To improve coordination, the Paris Declaration recommends using local and national procurement systems instead of external purchasing. Yadav cited the example of Zambia, where a drug supply budget line (DSBL) is used to ask donors for specific drugs according to needs. Also, a donor-coordinated pledge guarantee (PG) mechanism, such as an Escrow account, can be used to pre-position funds to avoid bureaucratic delays. Finally, minimum volume guarantees between manufacturers, donors and recipient countries can reduce procurement lead time, which is beneficial for recipients and development. Each of these practices is an example of how coordination within and between organizations can improve outcomes for affected populations.

Richard Owens of John Snow, Inc. (JSI), discussed inter-organizational coordination in the fight against AIDS. JSI is a public health research and consulting firm that seeks to improve the health of individuals and communities worldwide. The agency is a partner in a collaborative effort under the auspices of USAID called the USAID | Deliver Project. Owens described collaboration on the logistics efforts associated with this project.

USAID | Deliver seeks to increase the availability of essential health supplies in the areas of public health, including family planning and reproductive health; avian and pandemic influenza; and malaria. The project operates in 25 countries in Africa, Asia, and Latin America. Its Supply Chain Management System (SCMS) strives to establish supply chains to meet the care and treatment needs of people affected by HIV/AIDS. The SCMS project team is comprised of nonprofit organizations, private corporations, academic institutions, and faith-based organizations. Some of these members include Booz Allen Hamilton, the Fuel Logistics Group, JSI, PATH, UPS Supply Chain Solutions, and North-West University in South Africa. Other partners include CDC, the US Department of Defense, WHO, the World Bank, USAID, and NGOs. These members and partners collaborate in procurement and delivery, technical assistance for better supply chains and health systems, and finding long-term, local solutions. The keys to effective inter-organizational coordination are shared vision and mission, consistent

metrics and measurement, constant communication, customer focus, continuous performance improvement, common tools and technical approaches, supply chain visibility, and common purpose and culture.

General Conclusions
- Many stakeholders, including government agencies, military, private companies, non-governmental organizations, and academics, are involved in humanitarian response. The panel and discussions throughout the conference emphasized the importance of coordination and collaboration between these actors.
- This panel highlighted the challenges associated with this, including:
  o Aligning priorities
  o Communicating effectively
  o Integrating different information systems
  o Sharing costs
  o Working with different cultures
  o Coordinating logistics
- The panel also discussed approaches for improving collaboration and coordination, such as:
  o Developing shared purpose
  o Creating consistent metrics
  o Aligning system incentives and processes with key metrics and objectives
  o Fostering constant communication
  o Focusing on beneficiaries
  o Improving performance continuously
  o Developing common tools and technical capabilities
  o Increasing supply chain visibility
  o Managing change effectively
- While some suggest that humanitarian aid may contribute to problems, Prashant Yadav pointed to the Paris Declaration which says that if developmental aid is well-coordinated, it will not be detrimental. The aid must provide a clear trajectory and a path to transition back to local capability. Richard Owens further discussed the need for humanitarian organizations to balance short-term needs with long-term goals. These points further emphasize the need for improved cooperation.

Section 6: Plenary – The United Nations World Food Programme

Session Presenter:
▪ **Amer Daoudi**, *Director, World Food Programme Logistics Division*

The United Nations World Food Programme (WFP) is charged with providing food aid to vulnerable populations worldwide. In the opening segment of this presentation, conference attendees were reminded of the importance of logistics in this endeavor: "There is enough food in the world for everyone. The challenge is getting it there." Amer Daoudi addressed this challenge, the work of WFP, and opportunities for improvement in humanitarian logistics in this plenary discussion.

WFP is the logistics arm of the UN and has been designated by the international community to lead humanitarian logistics response in emergencies. The organization serves 100 million people in 82 countries with more than 9,000 staff members, of which over 3,000 are in logistics. On any given day, 40 ships, 5,000 trucks, and 100 aircraft are en route to serve people in need. In addition to delivering food, WFP builds in-country infrastructure. Building and refurbishing ports, airports, roads, railways, and bridges enables the delivery of food and supplies to support the direct mission and also facilitates long-term recovery and stability. This is critical, since the transportation sector typically represents 20% of GDP in the developing world. WFP considers it a duty to leave behind a viable transport industry after completing a mission. Sudan is one example of this success. After benefiting from the development efforts of WFP, the Sudanese transport sector now brings fleets to assist at other WFP sites.

"Where we operate, we are second to none!" Daoudi emphasized while discussing the cost and speed of humanitarian response by NGOs, charities, and UN agencies in comparison to that by the military, government, and private sector. Even so, the World Food Programme strives for a more rapid, efficient, and cost effective response. This is achieved through a combination of several tools. WFP utilizes five humanitarian response depots worldwide, and more than 30 non-governmental organizations use the space at these warehouses. Interagency cooperation prioritizes the first wave deployment. There are several sources of goods on which to draw: exchanges and loans take advantage of the multiple stocks of partners, the stocks of suppliers enable immediate purchase, and long-term agreements make virtual stock available. All requests are centralized through a single support office, providing a "one-stop shop" for resources.

WFP leverages logistics capabilities in the private and academic sectors to increase humanitarian operation effectiveness. In particular, emergency response assets, staff secondment, training, and knowledge transfer and creative solutions are important components of this endeavor. Private sector partners include TNT Logistics, Agility, Citigroup, Caterpillar, Google, and Pepsico.

Daoudi emphasized the importance of harmonizing humanitarian logistics response. First, accountability is necessary to improve effectiveness by ensuring greater predictability, responsibility for tasks, and partnership. Growing needs and increased expectations require that organizations must adapt, renew, and change to meet demand. Rising costs and lack of resources mean that organizations can no longer afford to compete with one another. "The current waste

from lack of coordination could really make a difference!" Daoudi explained. Together, these steps can help achieve effective interagency preparedness and response.

General Conclusions
- Development and response overlap substantially, as was discussed in the second panel. WFP finds that development is often necessary, especially in the area of infrastructure, to enable adequate response. Moreover, development reduces the need for future response.
- Logistics is a crucial component of effective operations. According to Daoudi, "I wish every agency would invest as much in their logistics as WFP does."
- Coordination is important and many opportunities exist here.
    o Many stakeholders contribute to effective humanitarian response, each with their own expertise.
    o Rules of engagement and principles for coordination between stakeholders must be established in advance.
    o In all cases, it is necessary to put the beneficiary first and save lives.
    o To get funding to support coordination, as opposed to only emergency response, donors must be engaged.
    o Realizing the potential of the United Nations expertise clusters and improving collaboration among agencies is an area with significant opportunity for impact.

Section 7: Lunch Table Discussion Summaries

Every table was given two or three discussion topics that deal with how NGOs, government, military, industry, and academia can improve disaster planning, response, and recovery, as well as long-term health and humanitarian aid. Each table discussed ways of dealing with the challenges and examples of success. Discussions from each table were recorded and summarized, with comments categorized into ten broad challenges and three types of tools to address them. General conclusions are presented in this section.

Challenge #1: High uncertainty in demand

Relief demand is unknown both in size and type, and it is affected by dynamic and hard-to-measure factors such as disaster characteristics, local economy and infrastructure, social and political conditions, etc. For instance, two earthquakes of similar magnitude may have entirely different outcomes if one hits a high population density area in a developing country and the other hits a better prepared city in a developed country.

Conclusions:
- Demand uncertainty is indeed a big problem. One should have at least a basic framework to model the demand based generally on historical data, past experiences, and most likely scenarios. In the case of Katrina, ordering a surplus of supplies was a great problem, and resulted in $81 million of MREs (Meals Ready to Eat) being destroyed by FEMA.
- NGOs and other organizations that give humanitarian assistance must be technology friendly, since technology is a primarily enabler for data management, and therefore also for demand information management.
- There should be information sharing between the organizations, since at different levels of the supply chain, the lack of communication leads to even higher variance, aggravating the problem.

Challenge #2: High uncertainty in timing

In general, it is difficult to predict exactly when a disaster will strike. This time frame could be relatively delimited as in a hurricane season or hardly predictable as in an earthquake. Therefore, organizations need to be in a constant state of readiness, plan over an uncertain time, and build flexibility into its operations.

Conclusions
- What does it take to be in a constant state of readiness?
  - Keep it on the agenda
  - Make it real, determine and communicate what the impact could be, make it personal
- Adequate inventory levels are critical for preparedness planning, especially given the high uncertainty of delivery lead times. Currently, with the purpose of decreasing costs, companies operate on very low inventory levels. However, NGOs and governments should look beyond costs since people's lives will depend, at least partially, on the availability of basic supplies. For instance, USA imports some medicines from China and India, with limited domestic supply. If a pandemic strikes China and India and medication cannot be

shipped, more casualties will occur in the USA because of the supply chain infrastructure falling apart and not because of the actual infection.

- Inventory pre-positioning is a suitable strategy to face uncertainty. For example, prior to Hurricane Katrina, FEMA waited for a request from the states needing assistance and did not take any action until after a hurricane or other disaster hit. Now, FEMA uses pre-positioning based on disaster history in Florida, Texas, Louisiana, and Georgia, and starts moving when a hurricane is on the way instead of waiting until it strikes.

- It is critical to know the level of available inventory in the supply chain. Web-based inventory systems are useful to keep track of valuable information about quantity and quality of the inventory on hand. In the case of food, this can include information pertaining to expiration dates. Although there are "free" inventory management systems available to organizations, often the cost of implementation is usually large. Additionally, more support may be available for systems that have a financial cost as opposed to those that are "free". Choosing the right support system is an important decision for adequate inventory management and disaster preparedness.

- Inventory management problems might be solved by studying the ways in which the military handles supply chains. The military has been using systems similar to what is needed in disaster situations for many years and quite successfully.

Challenge #3: High uncertainty in location

We may know where the fault lines are, but we can predict neither when nor where an earthquake will happen. For other disasters such as hurricanes, we may have more information based on historical data and models that help us predict the path of a hurricane after it forms, but even a specific storm can change paths. Affected locations might also be dynamic as in the case of a pandemic influenza, so planning should account for this. Location uncertainty imposes additional challenges to preparedness activities such as relief supplies and equipment pre-positioning, infrastructure investment, etc.

Conclusions:
- Economies of scope in established emergency response systems can support operations for neighboring cities, countries, etc.
- Standardization seems to be a common theme to improve disaster planning and response coordination across humanitarian organizations and countries, but it is difficult to achieve across multiple organizations and countries with very different characteristics. Effort could be placed on a decentralized model of smaller coalitions (neighbors/partnerships) with similar characteristics that can develop standard operating procedures among themselves; potentially limiting the number of standards to a more manageable level, for improved coordination and building self-sustaining modules within a larger global network.
- A more robust supply chain could be set up if supplies were donated in contract but not physically transferred. If a market could securitize donations, then at the time of need, multiple donors can pay down their donation credits by supplying relief. This would improve the responsiveness of the system since closer donors can meet demand, plus donations do not have to be tied to specific events.

- Multi-location and international corporations such as FedEx or Wal-Mart can bring flexibility, robustness, and agility to the system, since they have both infrastructure located in important logistics hubs and operational experience.
- It is important to use all historical knowledge to balance location security and accessibility when, for example, choosing stockpile locations.

Challenge #4: High uncertainty in supply

Donations may be variable or restricted in their use, while in-kind donations may also be inadequate or unmatched with the demand. Building up relationships with local vendors, usually in a very short period of time, may be a difficult task as well.

Conclusions:
- Short-term vs. long-term supply strategies have different focus:
  - Short-term: speed-based, substitutability
  - Long-term: lower speed, develop supply chain, reduce cost
- One big problem is the funding mechanism. It is possible to get funding when there is an acute problem, but it is hard to get funding to address long term issues of sustainability. It is more politically glamorous to give aid at the beginning of a disaster.
- There are often significant problems with in-kind donations. Some of these problems might be avoided through thorough communication and pre-planning. Consider the following examples:
  - The problem of receiving donations of expired items can be a result of long lead times. A product may not be expired when it is shipped, but may be expired by the time it is delivered to a disaster site. Considering lead times, while trying to reduce them as much as possible, is important when managing donations.
  - After the Kashmir earthquake, many individuals donated tents from their homes for use by the victims of the earthquake. But when they were delivered, many of the tents did not have instructions, there were missing pieces, or were partially broken. It is important to consider all the aspects concerning the use of donations at the affected location.
- Strategies to improve in-kind donations should be developed. For instance, the Red Cross asks individuals to donate to local organizations (such as Salvation Army) who are equipped to deal with these donations. These organizations can either identify those items that can be used or sell some items to raise funds for relief efforts. There are other ways to control the flow of supplies during a disaster response. Often, donations will appear in a disaster area without any knowledge of what they are for or where they originated from. It would be easier if the items are received at a central point where they could be organized. This would ensure that items were received at the affected area in an adequate order. Additionally, consolidation could decrease transport costs, since intelligent decisions could be made about aspects such as transportation mode, routes, and shipment contents.
- Developing relationships with local organizations that already have strong relationships with the population and local vendors is important to ensure timely response and support local economies.

Challenge #5: Challenges in collaboration among the multiple players and decision makers in a humanitarian supply chain.

Each of the responders (NGOs, governments, military, local authorities, etc.) may compete for limited resources to achieve their own goals, as was the case with limited airport capacity during the tsunami in 2004. Organizations and governments may also have different incentives that impair the effectiveness of collaborations.

Conclusions:
- Governments play a leadership role in determining what critical resources the country needs and achieving coordination among the NGOs and all related organizations. For example, FEMA (U.S. government Federal Emergency Management Agency), collaborates with GSA (U.S. General Services Administration), the Red Cross, the DLA (Defense Logistics Agency), the U.S. Army Corps of Engineers, and other organizations and agencies. FEMA operates as the National Logistics Coordinator and coordinates between these organizations. FEMA is currently working on "partner on boarding" in terms of inventory, ordering, and using unified systems.
- Alliances should be sought between for-profit and non-profit organizations, and between non-profit organizations. For example, if a community trusts one institution such as a church, then humanitarian organizations could work through this church in order to be more effective.
- Relationships/partnerships should be built beforehand, before a disaster occurs.
- It is difficult for organizations to maintain impartiality, for example when it comes to work with military. However, acts of good will could potentially diffuse animosity or improve public perception.
- Coordination of distribution efforts between different aid organizations can be improved with clear communication channels and information sharing. Additionally, there is often an overlap in the distribution of different aid organizations which may later end up in wastage.
- A potential strategy to indirectly facilitate collaboration is organization specialization, for example, with one organization focusing on clean water distribution.

Challenge #6: The impact of the political, cultural and socioeconomic conditions of the region

Unawareness of the specific local issues may cause even the best stand-alone plan to fail or be impractical. For example, genetically modified food is prohibited in some Southern African nations such as Zambia, and therefore food aid programs are more restricted there. The human factor is also crucial in humanitarian operations, and includes language, customs, political views, etc.

Conclusions:
- Understanding regional political, economic, and socioeconomic conditions is crucial for the success of the humanitarian operations. To understand this, consider the following real examples:

- Spaghetti was shipped to Macedonia, but the individuals in Macedonia had not seen spaghetti before. As a result, a lot of time was spent trying to explain what spaghetti was and how it is cooked.
- There have been incidents in which MREs containing meat were supplied by Great Britain. Due to stigmas related to mad cow disease, people receiving the MREs did not want to eat them.
- There was a chocolate bar packaged for use by military. In military, food containers are labeled as "Not for Civilians", similar to a local advertising campaign in which they were labeled as "Not for Women." As a result, when these chocolate bars were distributed during a disaster, individuals were not sure if they were safe to be eaten.

- There are cultural awareness training programs that create an opportunity for a given organization to meet with organizations that have previously worked in a region to learn about the local customs.
- It is essential to involve the community in the preparedness processes. Quoting one of the conference participants: "Your neighbor is the one who will save you," not a humanitarian organization. Thus, working with local communities and talking about preparedness will foster a common language, and then preparedness efforts can become more systematic.
- Understand the local community's coping mechanisms first, before imposing other preparedness measures. Additionally, public perception is essential in influencing the success of an operation.
- Simulations and drills are crucial.
- Maintaining organizational integrity in highly-charged political conflicts is challenging but essential (e.g., controlling the degree of involvement with military and governments).

Challenge #7: The strong dependency of the last mile operations on the location and severity of a disaster

Transportation infrastructure might be disrupted and required equipment may not be locally available, affecting the supply chain responsiveness. This can be aggravated by limited location access or poor construction. This was the case of the 2005 earthquake in Pakistan, where people lived in mountainous regions and had limited aid access to because of obstructed roads.

Conclusions:
- The first question should be what capacity is already in place. For example, churches were used for last mile operations after Hurricane Katrina. Good connections to local organizations are essential to both collection and distribution operations, and it is important to use their expertise and competency in screening and filtering different operational options.
- Using local capacities and assets (e.g., people with time, mules, carts, etc.) also adds the benefit of giving the communities dignity and opportunities to participate and help.
- Planners may assume that bridges and roads are safe, whereas disasters may cripple infrastructure (in some scenarios, infrastructure may not even exist). It comes down to planning for different scenarios, taking into account different levels of infrastructure availability.

Challenge #8: Limited telecommunications and information infrastructure

The Internet is still not widely available or reliable in some developing countries; land-based phones and cellular phone communication towers might be down as a result of a disaster, as was the case after Hurricane Katrina hit. Also, since there might be more than one organization collecting data, it is common to find inconsistencies in the aftermath reports.

Conclusions:
- Information from and communication with people on the ground is critical.
- The use of mobile phones when possible has obvious advantages: ability to communicate timely warnings, support preparedness, and enable response coordination.
- Telecommunications companies may see an agile disaster response as a marketing opportunity. For instance, if they are the first ones up and running, they will have more satisfied customers, and customers will know they can be relied upon in the future if another disaster should strike.
- Implement new information gathering ideas like tracking online search behavior to help forecast certain disasters, where the symptoms and outcomes can be observed more quickly than when using only formal modes of communication.

Challenge #9: Long-term impact of the many activities carried out during humanitarian operations

This happens as cities might be rebuilt, people might be relocated, new products and vendors might be introduced to the local market, etc. This is the case of the food aid monetization from the U.S. government, which starts with a donation of food to NGOs around the world, and then NGOs get funds for other aid programs by selling the in-kind donations in the local markets.

Conclusions:
- Socioeconomic impact is undeniable, but it could be reduced. For example:
  - In some African countries, dried milk powder was provided in the area. Because of the low cost of this milk among other reasons, there was a significant decrease in the demand for regular milk, and this caused great problems for the dairy farmers in the region. However, it might be possible to buy milk from farmers while also supplying powdered milk. This would allow the individuals to receive the health benefits of the milk, without a detriment to the livelihood of the economy of the region.
  - Economies can be greatly affected by the introduction of donated clothing into an economy. In one example, clothing was originally created in Sri Lanka, and purchased elsewhere, and then provided in donations in Sri Lanka. As a result, the market for the manufactured clothing in Sri Lanka was detrimentally affected, since the same clothing that was for sale was then provided for free. It is very important to look at the entrepreneurial characteristics of the area.
- Possible impact should be analyzed in a timely manner since if some sort of aid is provided that has an impact on the economic prosperity in a region, it might be too late to make any changes by the time that the problem is realized. It may be possible to try to determine the side-effects of an intervention in advance, but it is often hard to be able to identify them in advance. Past experiences and information sharing could be really helpful. For instance, in

the case of the powdered milk, it has been shown that by using powdered milk as opposed to breast milk, transmission of HIV between mother and baby could be decreased. But in other situations, with poor water and sanitation, powdered milk rather than breast milk can be very unsafe due to water contamination. In these cases, providing powdered milk can be worse than providing no milk, since it requires the use of water.

- Consider what is actually needed in a region. Often, the economy functions such that it makes more sense for individuals to try to sell donated goods in the markets rather than using donated goods.
- Countries often don't have the resources needed to sustain the aid that they have received (e.g., they don't have the parts needed to fix a donated water pump). Donors should seek to provide aid that is sustainable by the local communities.
- In some cases, people who relocate in a humanitarian situation will not move back; therefore a region might not be the same afterwards. Moreover, refugees often receive better food and medicine than those who stay in their homes, which is an incentive to stay in the refugee camps. For instance, the average duration of stay in a refugee camp in Africa is 7 to 8 years. One strategy that has been implemented by the Red Cross in Sudan is to avoid refugee camps when possible, but instead take relief supplies (food, medicine, tents, etc.) to where people live.
- There are some differences and tradeoffs between short-term effectiveness of the response and the long term impacts:
  o Funding is more readily available for short term response because people are more sensitive just after a disaster happens.
  o Maintenance and treatment after a disaster is more difficult to complete because it requires a greater budget and longer time.
  o Early warning systems are more costly to setup; however, they are critical in preventing potential damage.
  o Training the locals can help both short and long term impacts. It is not always easy to reach a disaster area from outside. If locals are educated, this would decrease the response time. Local people can be educated with flyers, lectures, pictures, etc., before a disaster happens.

Challenge #10: The success of humanitarian operations is hard to measure.

Economic success is the standard performance measure in the for-profit world. In non-profit organizations this evaluation is more complex, considering difficult-to-formulate factors such as unmet demand, where demand is a broad concept in humanitarian operations and could mean shelter, food, healthcare services, security, or other needs.

Conclusions:
- Humanitarian operations form a continuous improvement cycle that requires coordination and communication. After a disaster, lessons should be discussed and documented. The objective should be that these lessons do not appear over and over after every disaster. "After-action" reports to learn and improve and to estimate potential costs of mitigation and preparedness actions should be used.
- Establishing effective ways of measuring and tracking the results of the humanitarian operations is particularly important in corrupt countries and environments, avoiding

strategies like "truck and dump", without following up to learn where the supplies ultimately went.

- In the for-profit world, the customer both receives the goods/services and pays for them, so profit is a reasonable measure of success. However, in the humanitarian sector, the donors pay while the beneficiary receives the goods/services, so profit (or even grant money received) cannot be used as a measure of success in the same way. There are different metrics that are more or less related to the success of humanitarian operations. Examples include health indicators such as the welfare of children under five years old (if they are doing well, the rest of the population is likely to be doing well also), as well as logistics performance metrics such as the maximum lost for item and route (comparing what was sent with what was delivered) or the number of days to get from port to destination.
- Humanitarian organizations should be measured as a whole. Some potential metrics include:
  o The "reach" of an organization, in terms of geography, number of people, and speed of response
  o The "preparedness" of an organization, such as resource availability (e.g. manpower, contracts for goods/services, etc)
  o Perception (of an organization within the community they serve)
  o Targeting (what to send, and to whom to send it)

Tool #1: The role of information technology (IT) in disaster relief and general aid programs

Information is an important enabler of the successful implementation of a disaster relief or general aid program when it is properly managed and applied. Information technology could be anything that helps to produce, store, process, and disseminate information. Examples range from computer networks and databases to state-of-the-art information management software.

Conclusions:
- It is important to track where help has been provided and where help is needed. Information (accuracy, timeliness) is necessary for visibility in a supply chain, and adequate technology facilitates that.
- One important issue about the use of IT is data collection. It is hard to take the time to collect the data within an emergency setting; people want to act fast and save lives, and they think little about information recording. But most of the data collection should be done before the disaster, such that only a small update is needed to reflect the current situation. Information recording must be done on a daily basis, and not after a major event.
- There is a large amount of data that it is already recorded somewhere (financial data, medical data, census data). The problem is that the owners of the information sometimes do not share their information with each other; therefore, people do not know what is out there and duplicating efforts occur. Organizations such as NGOs, governments, military, universities, and private companies should share public interest information. Ideally there would be a universal system for information sharing, especially across organizations that are providing aid.
- How are we using the information? Knowledge management is important. First, we have to be clear about the questions we want to answer; then specify what information will be required; then determine how we will collect, aggregate and codify the information; and

finally decide how we will analyze the information in order to answer our questions with the latest and most reliable data.

Tool #2: The role of education in disaster relief and aid programs

Education is an important foundation for the planning and implementation of successful disaster relief and general aid programs. Necessary knowledge and skills can be developed through educational programs that could be as general as a management course, or more specific to the humanitarian operations.

Conclusions:
- "This needs to be seen as a profession" and "all disciplines need an understanding of this field". For instance, setting up refugee camps is as complex as setting up a small (or large) city.
- IT has a huge role supporting education, from distance learning to knowledge management.
- Education includes two different sides. The first side is that of the people in need, and the second that of the people that supply this help. In this respect, among several examples there are:
  - Professional courses which meet once or twice a week allowing people to continue their regular work lives
  - Webinars: These are online seminars to which anyone can log in and participate. Since it is online, people can spend less time for traveling but still be in touch, with less cost both in terms of expenditure and time.
- Educational programs in relief and aid curricula should include:
  - Hands-on experience – critical (e.g. internship with agency, volunteering)
  - Developing an understanding of cultural norms
  - Developing ability to collaborate
  - Other necessary skill sets, which need to be identified in structuring a program
- Problem-based methods, such as case studies, have shown to be successful in the learning process. Humanitarian logistics education should be directed towards those types of methods, instead of the more traditional ones (like regular lectures, courses, exams, etc.), since they are more practical than theoretical and based on real-life decisions.
- Humanitarian supply chain management also needs managerial experience. For example, before Hurricane Katrina, FEMA staffed their management positions with people with first-response experience, many of whom did not have management or strategy experience. FEMA now places people with logistics or other high-level experience in management positions.
- Training and informing the whole community is important in preparedness planning. NGOs and governmental organizations should take responsibility for raising awareness in the public. The Red Cross initiative "Ready Rating" is an example of this. This initiative has the objective of engaging businesses, schools, etc. to increase readiness at the community level, and includes public recognition.
- Companies should also recognize that being active in disaster response is better for their business (e.g. Waffle House Restaurants, The Home Depot, etc.), and when possible establish a single humanitarian logistics group to become specialists in this area.

Tool #3: The role of science and research in disaster relief and aid programs

Humanitarian operations are very challenging. Research could help to make substantial improvements on the way things are currently done, through the development and application of adequate analytical methods and systems.

Conclusions:
- Universities are universal and partnering with other universities all over the world is important to create a broad network among educators and researchers.
- Universities may act as a neutral party since many humanitarian organizations share different ethics, beliefs, etc., but science is a universal language and can facilitate the sharing of knowledge and best practices.
- Consistency across analytical models and systems would allow for increased knowledge/best practice sharing, rapid implementation and deployment, and leveraging capabilities across different humanitarian organizations and participating countries.
- Two-way relations between universities and organizations are necessary for success in preparedness planning. First, they should learn about each other's capabilities, problems, and advantages.
- Researchers can focus on more innovative solutions and dedicate their resources to these efforts in order to make radical innovation versus incremental innovation. For example, why do we ship ice to flood victims after a major hurricane, when we can improve technology like desalination to treat water onsite?
- Academicians should get out in the field to better understand the real aspects of the problems they are working on. It is important to make sure academia is solving real problems and not ignoring the true aspects. Academic communities need to:
  - Be involved
  - Solve not only those problems that are easy to model
  - Get close to problem
  - Have field information
  - Develop robust and easy to use models
  - Develop case studies and more involved/distributed "after-action" analyses
- Some research opportunities are the following:
  - Cost-benefit assessment of mitigation could help convince donors to support capacity-building if they could see in numbers what these efforts would be worth in long-term impact.
  - Collaboration mechanisms need priority. Development of standards can dramatically improve many areas, especially logistics.

Section 8: Poster Session

Throughout the conference, poster displays highlighted the work of researchers and practitioners in the field of humanitarian logistics. Session breaks saw conference participants interacting with poster presenters to learn more about ongoing efforts in this area. Thirty-seven posters represented work being done at academic institutions such as MIT, Stanford, the University of Manitoba, and Georgia Tech; governmental agencies including the CDC; private companies such as Northrop Grumman; and non-governmental organizations such as CARE, the World Food Programme, and MedShare. Many posters represented partnerships across multiple sectors.

The poster session focused on work being done to improve humanitarian logistics efforts through all phases of an event, including preparedness, response, recovery, and long term development and mitigation. The kinds of events addressed by these projects also spanned a wide spectrum: hurricane preparedness and response, disease prevention and mitigation campaigns, emergency food provision, debris collection, and blood collection were among the topics addressed. Methodologies from social sciences, operations research, and computer science were all represented.

The breadth of the work presented in the poster session provided the opportunity for conference participants to network and develop contacts for future work in this area. Full abstracts of all of the posters are available at http://www2.isye.gatech.edu/humlog09/posters/humlog_abstracts.pdf.

Section 9: Workshops

Workshop Presenters:
- **Maria Rey**, Executive Director of the Center for Emerging Logistics and Supply Chains, *Managing Performance in Humanitarian Logistics*
- **Dan Stowers**, Planning Director, Georgia Emergency Management Agency, *Pre-Planning and Response to Large-Scale Domestic Events*
- **William R. (Ray) Doyle**, Senior Research Scientist, Georgia Tech Research Institute, *Pre-Planning and Response to Large-Scale Domestic Events*

The second day of the conference consisted of two parallel workshop sessions to promote networking and skill-building among conference attendees. More than 70 participants contributed to the interactive workshops, representing government agencies, non-governmental organizations, academic institutions, and private sector companies.

The first workshop, entitled *Managing Performance in Humanitarian Logistics*, built on the well-understood goals of for-profit logistics organizations to develop performance management tools for humanitarian logistics agencies. In the for-profit logistics world, key logistics objectives are the maximization of profitability and customer satisfaction. In the humanitarian logistics space, in addition to minimizing cost while optimizing delivery times, the key concern is the impact of performance as a determinant of the survival of the affected population. Therefore logisticians have to manage a different set of rules when allocating inventory, choosing transportation modes, and selecting vendors or stocking locations. In addition to this complexity, most humanitarian organizations have a large set of stakeholders that care about organizational performance, thus complicating the designing of metrics when balancing the needs of donors, beneficiaries, suppliers, and internal management. The objective of this workshop was to present participants with a proven framework to manage and measure performance in humanitarian logistics operations. Participants worked interactively to review the parameters for metric design, identify appropriate metrics for logistics performance, and explore the management applications of performance measuring systems such as benchmarking, self-assessments, financial justification, and project analysis.

In the second workshop, *Pre-Planning and Response to Large-Scale Domestic Events*, an overview of the history and organization of large-scale event response was followed by a facilitated discussion among workshop participants of responses to varied incidents. The country has been struck by large-scale natural and manmade disasters many times over the past few years and such events have been brought to the national forefront. Even though the events are varied and seem unrelated, experience has demonstrated that the skills required for planning and responding to any type of large incident are similar. This workshop helped identify general requirements and issues associated with response to large-scale incidents and provided two example scenarios to be used as a basis for comparison. The attendees discussed elements of responses that are similar and unique to each type of incident, comparing the examples of widespread flooding across several states and a domestic terrorism attack in a major metropolitan area. Topics of discussion included roles and responsibilities of different groups in each scenario, skill sets required to address the scenarios, and the steps participants can take in their organizations to help prepare for these or other large-scale domestic events.

Section 10: Conclusion

The 2009 Humanitarian Logistics Conference concluded with a summary of important points raised and lessons learned throughout the sessions. Take-away messages emphasized:

- Supply chain standardization and automation – growing smarter
  - Both within and across supply chains
  - Addressing complexity of going from entities with resources to those with needs
- Measurement and evaluation
  - Types of metrics – speed, losses, cost, accountability, short and long term impact
- Goal-setting
  - Planning for sustainability by growing local capacity
  - Measuring final outcomes, not only starting projects
  - Focusing on both level and equity in health
- Collaboration at all levels
  - Transparency
  - Division of responsibilities
  - Common purpose
- Modeling to improve decision making
  - Clarify, unify, and energize rather than alienate
  - Design for (possibly limited) solution space
  - Ask questions, even ones that seem unrelated
  - Build flexibility into the system
  - Make it appropriate for the need

The conference was successful in bringing together humanitarian logistics stakeholders from business, academia, government, and non-governmental organizations. The interaction was an important step forward in defining challenges, opportunities, and goals for practitioners and researchers alike. Much important work remains to be done to meet these objectives. By drawing on the lessons and relationships developed at the conference, these efforts will have substantial impact on some of the most pressing problems of our time.