Welcome back for another installment of Komaza! Each semester brings new changes, but perhaps the biggest change has arrived this fall. As our publication grows and expands, we are rethinking the very look and feel of Komaza. This issue marks Komaza’s very first glossy edition, as well as the beginning of a completely student-led design initiative. In fact, I would like to take this opportunity to introduce Abir Liben (’14), our talented graphic design artist, who has carefully crafted the layout of the issue you are holding in your hands.

We hope you enjoy the stories that follow in the subsequent pages. In this issue, we bring you: perspectives on two, innovative, MIT-student founded organizations—one pursuing waste management in Kenya, and the other spearheading engineering education internationally, thoughts from two new ID groups at MIT, as well as one student’s experience interning at a international development organization this summer in Washington, D.C. With each piece, we hope you take away something new and become more inspired.

On behalf of the Komaza team, thank you for continuing to support our publication. We hope it’s a good one.

Sincerely,

Sudha
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   My summer with the Center for Global Development
“I didn’t even know what I was getting into,” says Zoe Snape (’15, Course 6). A pyramid scheme? Grand theft auto? Cyberwarfare?

Turns out it wasn’t anything quite so scandalous. But it wasn’t exactly tame either. Last fall Zoe signed up for D-Lab: Discovery, one of the non-residence-based seminars, as her freshman advising seminar. D-Lab: Discovery is a hands-on introduction to creative design aimed at addressing engineering problems in international development. The class is based on a series of modules with material themes: wood, plaster, plastic, and metal.

“I got introduced to this really cool department and program that I probably wouldn’t have heard of otherwise.”

On the first day of class, the students were given an assortment of materials, and the task of building a rudimentary water fountain in half an hour. This intro activity summarized what Zoe learned most from the class: how to cultivate the motivation to flesh out ideas for unconventional projects, and to just dive in and start building.

Given this prompt, the seminar students quickly discovered perhaps the greatest challenge with D-Lab projects — properly simulating developing world conditions. Though the class lab space housed plenty of power tools, the students were not usually allowed to use them.

For example, during the metal unit, students consulted experts in the smithing department. They then made Styrofoam models and created metal casts themselves. According to Zoe, making a metal cast is simple: you “pack sand around [the Styrofoam], leaving a hole, and pour the liquid metal in, and it vaporizes the Styrofoam and fills the hole.” To finish, they strung a hot wire through the hole and shaved away at the block with an old soldering tip.

Eventually, the real-world design problem was introduced to the class. Over the last few weeks, students focused on finding a way to more efficiently dispose of trash in a Central American country. While the option of going forward with the final project outside of class was given to the students, none of them pursued it last year, though several subsequently took different classes within D-Lab.
One of the teachers of the seminar is the founder of D-Lab and the International Development Design Summit, Amy Smith, who was named one of Time’s 100 most influential people in 2010. During the seminar, students have the opportunity to interact with many members of the D-Lab staff.

For more information about D-Lab: Discovery, visit http://d-lab.mit.edu/courses/discovery.

“I didn’t know anything about D-Lab when I signed up for [the seminar]—I didn’t realize it was connected with D-Lab and what D-Lab was,” says Zoe. “It worked out luckily, because I got introduced to this really cool department and program that I probably wouldn’t have heard of otherwise.”

Other D-LAB Courses

Cross-Cultural Investigations
D-Lab: Biodiversity
D-Lab: Cycle Ventures
D-Lab: Design
D-Lab: Development
D-Lab: Discovery
D-Lab: Dissemination WASH
D-Lab: Energy
D-Lab: Health
D-Lab: ICT
D-Lab: Mobility
D-Lab: Schools
D-Lab: Supply Chains
D-Lab: Waste
Developing World Prosthetics
Development Ventures
Every organization begins from simple observations.

In March 2011, Kevin Kung (G, Course 20) travelled to Kenya through a Sloan Global Health Delivery Lab. While working on his global health consulting project in Kibera, Kenya, he observed copious amounts of charcoal being traded on the roadside.

Charcoal as a cooking fuel was unsustainable, expensive and sometimes illegal.

Sharing this observation with his community partner, Carolina for Kibera, he realized that the heavy use of charcoal as a cooking fuel was unsustainable, expensive and sometimes illegal. Due to deforestation concerns, producing wood charcoal in rural forests is prohibited, driving up its cost.

Fuel can be produced cheaply from household organic waste - which abounds in Kibera, Kenya's largest slum. This process must be optimized, however, to yield efficient and clean-burning fuel. Experts in MIT’s Development Lab and MIT’s Community Innovators Lab (CoLab) supported Kung as he researched briquette production and charcoal presses.

Takachar—which combines the English and Swahili words for charcoal and waste—was born in the fall semester of 2011. It is affiliated with MIT’s Engineers Without Borders (EWB) (Kevin himself participated in Princeton’s EWB chapter as an undergraduate). The Takachar team embarked on a pilot trip to Kenya during IAP and an extended 2-month trip last summer.

Still, it can be difficult working from a distance. Field tests conducted in the Kresge barbeque pits required careful planning. “You have to call the fire department and alert the Z center staff so they don’t try to get you arrested,” jokes Jacob.

Jacob and Kevin spent four weeks during IAP in Kenya laying the foundation for their summer trip—tracing current charcoal supply chains demonstrating their technologies, and surveying communities.

They spent a week staying in someone’s farm in a rural area of Kenya neighboring the Rumuruti forest.

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Such projects were adapted to urban settings and behaviors in the remaining three weeks of IAP. In Kibera, they met with community members and performed comparison studies.

Waste pickers could stand to benefit by selling briquettes made from organic household waste. Jacob and Kevin observed the briquetting process of the city garbage recyclers and performed calorimetry experiments to measure the energy output of market-purchased charcoal.

Taking their product to their key consumers, Jacob surveyed approximately twenty Kenyan families about their cooking habits and expenses and also measured carbon monoxide emissions in their homes.

One family cooked ugali—a Kenyan dish of maize flour—using both wood charcoal and charcoal composed of organic waste. More tightly compressed briquettes yielded less smoke and higher energy density. Though wood charcoal briquettes cooked food faster and more densely, they produced uncomfortable heat in the households.

“Seeing that there’s more to a project than just the technical aspect,” was especially interesting for Jacob because he was able to approach problems from various perspectives.

Over the spring, Jacob worked to modify the pyrolysis kiln and process the IAP data while other members of the Takachar team researched binders and planned for the summer’s trip. Lyndsy Muri (’15, Course 16), described grocery shopping for bananas and mangos in the local Shaw’s supermarket to conduct burn tests.

In Nairobi, over the summer, Lyndsy, Wellesley student Daisy Chang, and Viveka Mishra (’14, Course 2) produced and tested briquettes made from urban materials.

Some of the available binders tested were rotten avocados, cornstarch paste, and even gum arabic.
Fuel can be produced cheaply from household organic waste which abounds in Kibera, Kenya’s largest slum. This process must be optimized, however, to yield efficient and clean-burning fuel.

According to one of Viveka’s blog entries (takachar.blogspot.com), some of the available binders tested were rotten avocados, cornstarch paste, and even gum arabic. The three team members held one to two burns daily measuring factors such as emissions and speed of boiling.

But using locally sourced materials was not always easy in the urban setting. Kenyan households rarely discard fruit and vegetables. The Takachar team found more luck in marketplace dumps, which usually contained more banana peels and leaves than in households.

Still, these organic waste products needed to be dried before they were burnt. Although it was winter in Kenya, the 60°F weather meant leaving the banana leaves out on the ground for a week or two before they could be burnt.
Then, over the summer, the team optimized the choice of local binder and improved their charcoal press.

Lyndsy and her companions also connected with men in the local youth group, sorting trash with them one day. These men generate income by holding daily car washes and sifting through the waste of approximately fifty households to find materials, such as solid metals or plastics, to be sold. They still stay in contact and one of the youth group members recently presented the briquetting data at an International Trade Fair.

“People, not charcoal, made it a life changing experience”

“People, not charcoal, made it a life changing experience,” says Lyndsy, who describes the welcoming and generous individuals she met on her trip. Currently enrolled in Course 16’s infamous Unified Engineering course, she works mainly to process and present the summer’s data this semester.

Takachar’s innovative solution, meticulous recordkeeping, and many participants have made it a strong contender in the quest for grants. After their IAP pilot trip, Takachar entered the IDEAS/Global Challenge Competition and won $5,000 from the 2012 Muhammad Yunus Challenge.

Last year, the theme of the Yunus award was “Waste: Put It To Use.” On its IDEAS profile page, Takachar, which aims to manage 20 tons/week of organic waste, provide 200 households with reliable charcoal supply, and save 700 trees/year by the year 2014, certainly fits the bill.

In the future, Kevin hopes that Takachar can expand its impact within Kibera. IAP 2013 and Summer 2013 trips are currently being planned. He hopes to “develop a portfolio of different waste management techniques and technologies” both in Kenya and other countries. His goals are ambitious, but so far none of his talent seems wasted.

You can learn more about Takachar and keep up-to-date with its activities by visiting its blog at http://takachar.blogspot.com/.
GlobeMed MIT is the MIT chapter of the nationwide student-run organization of GlobeMed, a group that partners students with grassroots organizations to bridge health disparities. Founded in 2011, GlobeMed MIT is on its way to expanding and becoming a successful organization on campus.

Recently, Komaza interviewed one of its founders, Divya Srinivasan (’13, Course 7 and 15), who discussed GlobeMed’s vision and plans for the future.

What is GlobeMed’s mission?

We recognize that having a wealth of knowledge on the global health crisis and its implications and potential solutions makes us responsible to keep the broader MIT community informed. Hence, we want to position ourselves as informed leaders in the global health movement on campus.

Is GlobeMed only for pre-med students?

Premeds- absolutely not! GlobeMed’s student body is so diverse. While it is true that premeds are inherently interested in global health issues, it is by no means an exclusive group. We have tried to break this stereotype through proactive recruiting of people who genuinely express enthusiasm for the cause. Pre-med or not, we are all bound by the common passion for global health.

How do you engage with the MIT community at large?

We have a Global Health newsletter that we circulate to keep the campus updated on relevant global health news. We are also present on social networking sites like Facebook and Twitter through which we keep the campus updated on the latest developments in global health and also publicize our fundraisers. One of our biggest events of the year so far has been Hoops for Hope. Basically, students registered in teams of 3 to 5 through a donation of $20 and played basketball to win prizes. The proceeds went to our health partner Hope through Health, which works to improve pharmacy and capacity management for HIV/AIDS clinics in Kara, Togo.

Who is your partner and what’s your primary project?

Our partner is MHP (Maeying Huamjai Phattana or Women Mobilizing for Development), a non-profit organization founded in 2011 to find solutions to poverty in the rural communities of Bokeo, Laos. By devising methods to improve poor infrastructure, addressing the agricultural and nutritional needs, and supporting ethnic minority women, MHP strives to take a holistic approach to make a true difference at the bottom of the pyramid. Our current project with MHP is the “Home Garden Initiative,” which aims to develop sustainable and nutritious sources of food by encouraging the implementation of viable methods to plant fruits and vegetables and by constructing ponds to raise fish and frogs. We will ensure sustainable food production by establishing proper irrigation and fertilizer facilities. Our goal this year is to raise $2000.00 to benefit 16 families across 8 villages in Bokeo.
Any last thoughts?

I joined [GlobeMed] because I was inspired by the work that GlobeMed was doing at other chapters. I had read a lot about how GlobeMed was helping undergraduates effect change all over the world and wanted to be one of those students. I applied to be a founder because GlobeMed embodied what we learn at MIT- mens et manus. It wasn’t just about learning about the global health crisis in a theoretical setting but it was also about applying that in the field and learning how to problem solve in the real world. Since founding GlobeMed, I have been profoundly impacted by it. I’ve met some fantastic mentors in the GlobeMed network through my work as a chapter founder.

I’ve met some incredible people on campus whose enthusiasm for global health solutions and creating impact is a source of inspiration for me. I’ve learned what it means to really create change- how much hard work is required, the importance of fundraising and planning, the ‘magic’ of teamwork, and the value of communication. For students who want an experience that takes what they learn in the classroom and applies that knowledge in the real world, GlobeMed is the right organization. For students who want to meet like-minded and passionate peers, GlobeMed provides the right forum to do so.
The Practical Energy Network (PEN) is a group of MIT students and alumni that aims to build a collection of hands-on educational resources for science and engineering designs suitable for developing countries.

The idea was born out of the realization that many students in developing countries have the skills to be creative, but lack the resources to channel their creativity into design. The project was started by Ed Burnell (’13), who initially taught solar technologies in Ghana. He later became interested in hands-on education and published a book on energy technologies and do-it-yourself engineering. He was looking for a team to help him, which eventually led to the creation of PEN.

PEN believes that teaching science and engineering is the most powerful solution to daily life challenges and directly impacting a student’s life.

As such, PEN’s curriculum uses resources found in developing settings and is geared towards designing solutions to daily problems. For example, one of its ideas has been to harness power from simple solar cells and water pumps.

Many groups that focus on hands-on education already exist, but there isn’t much collaboration among them. Rather than re-inventing the wheel, PEN wants to bridge this communication gap by providing an online platform on which educational resources can be shared. By collecting lesson plans and connecting with teachers to raise awareness of its online resources, it aims to provide these downloadable lessons for free.
In addition, PEN wants to provide training for teachers. The hands-on PEN curriculum is very different from what teachers are used to, and PEN considers that without training, teachers will not know how to handle the lessons.

In 2012, PEN won the Global Villages Award in the IDEAS competition. PEN learned a lot from the IDEAS experience—while its initial idea in 2011 was the creation of a hands-on engineering handbook, the vision changed during the competition process. The feedback PEN received was crucial for reflection on how to move the project forward, how to best push the knowledge offered in the book to the field, and how to enhance the work’s on-ground impact. As a result, this is where PEN has been most widely successful—by being open to changing its course when the project demanded it.

Currently, PEN members are spread out across the world over four continents. In San Francisco, the curriculum is currently being tested in schools. PEN member and Fulbright-scholar Anna Waldman-Brown brought the curriculum to a school in Ghana. And, some Peace Corps volunteers are even taking the curriculum to schools in Tanzania. Though this has been invaluable in expanding the impact of PEN, being so spread out is also one of its biggest challenges. Though the team tries to regularly meet on Skype, with transcontinental time differences, this is not always easy.

Today, PEN is working on forming closer connections to the D-Lab department at MIT, as several of the PEN members are former D-lab students. D-Lab is already heavily involved in education work in several countries and hence is a valuable resource for the team. D-Lab is starting D-Lab: Education in the spring, which will guide students in how to teach in developing countries. Some of PEN’s team members are expecting to help with the class, which would give them an opportunity to find more local partners.

Finally, PEN is also rethinking its vision. It’s moving away from an energy-focus to more of a general science and engineering education. As such, PEN may soon transform to become the “Practical Education Network.”

Many groups that focus on hands-on education already exist, but there isn’t much collaboration among them. Rather than re-invent the wheel, PEN wants to bridge this communication gap by providing an online platform on which educational resources can be shared.

If you would like to learn more about PEN, please contact pen@mit.edu.
This summer, Narek Dshkhunyan (‘15, Course 6) and Sarine Shahmirian (‘14, Course 7) spearheaded a project to teach Armenian high school students organic chemistry and biology in just three weeks. The idea was an offshoot of a community service requirement under the scholarship program LUYS, in which recipients implement a project of their choosing in Armenia. Narek and Sarine decided to teach summer school courses for high school students with the intent of not only preparing students for college courses, but also to strengthen their English and prepare them to attend college in English-speaking countries.

Their primary motivation was to encourage students to pursue education outside the country, to gain a more diverse education, and then to give back to Armenia, just as they have been inspired to do. They realized that teaching is the best avenue to reach these goals—though Armenian students have the ambition to learn, Armenian teachers may not necessarily be qualified to teach what they want to learn.

Narek and Sarine taught high school students the same material that they themselves learned at MIT. Over a course of 15 lectures and additional afternoon recitations, Narek and Sarine taught an overview of organic chemistry and biology. To improve problem-solving and to test the students, they also included MIT problem sets and mid-terms in the course. What was pleasantly surprising, and a testament to the MIT-mini course, was that the Armenian students got similar averages on the exams as MIT students did. These students worked hard and enjoyed learning – and it showed through the success of the course.

One of Narek and Sarine’s main challenges was overcoming the nation-wide lack of English ability in Armenia. “Armenia just doesn’t teach English aggressively. Students know English, but they haven’t had enough practice with it so they are still struggling. This would put them at a disadvantage in today’s global environment,” says Sarine.
Another challenge is the lack of funding for education reform, without which schools are using an educational system developed over 20 years ago. Few are investing to write new textbooks or train newly qualified teachers, which then reflects on the quality of Armenian education. As a result, students are not aware of even the free informational resources that are offered online, which could compensate for what they are not learning in the classrooms.

What was pleasantly surprising, and a testament to the MIT-mini course, was that the Armenian students got similar averages on the exams as MIT students did. These students worked hard and enjoyed learning – and it showed through the success of the course.

For Narek and Sarine, last summer was only the first step. They hope that every year, a group of American students can go to Armenia for three months to teach summer courses. As for this coming summer, Narek and Sarine aim to recruit additional students to teach extra subjects: not only organic chemistry and biology, but also math and computer science, and over a longer time span than three weeks. More importantly, Narek and Sarine want to push for internal Armenian government support for summer school, such that their teaching plan will no longer be an outside-in strategy.
The hunger issues in the United States are changing fast. Five years after the onset of the economic downturn, the problem of hunger continues to escalate. Nationwide, 14.5 percent of households are currently food insecure, including 6.4 million households that are considered as having very low food security (USDA ERS 2011). This means that 95.9 million Americans are at risk of or suffering from hunger by living at or below the federal poverty level (U.S. Census ACS 2010). These harsh statistics strike an alarm bell for MIT Fighting World Hunger (MFWH), a student group founded in Fall 2011 to mobilize MIT students to fundraise and leverage MIT resources to make an impact on relieving hunger.

Since its founding, MFWH has raised more than $8,000 in collaboration with the Harvard Kennedy School for an orphanage in Kyrgyzstan. The fund is used to provide food and heating for 43 kids in Orlovka Orphanage in the harsh winter. In addition, it started the first Hunger Strike at MIT to raise awareness, and organized the first annual MIT Hunger Banquet. To keep the MIT community up-to-date with its activities and accomplishments, MFWH publishes a biweekly newsletter as well. The students of MFWH believe that ending world hunger by the current generation is a realistic goal—and feel that MIT can certainly play a big part in achieving that goal.

This semester, MFWH will focus on solving local hunger issues and working with soup kitchens in the Boston and Cambridge area. Ting Mao (’13, Course 14), the founder of MFWH, explains the motivation behind this ambition. “A few weeks ago, when I was volunteering at Rosie’s Place, a sanctuary for poor and homeless women in Boston, I was shocked to see so many women in desperate need of assistance for basic survival. The staff in Rosie’s Place told me that the founder was abandoned by her parents when she was young, and hence built this place to provide security and to maintain dignity for women in need.

Nationwide, 14.5 percent of households are currently food insecure.

Rosie’s place also provides short-term housing, educational resources and social activities. By serving those women food ourselves, and chatting with them, we realized as students we could actually make a tangible positive impact on their lives by showing support.”

Indeed, hunger issues in United States cities can be easily ignored as people tend to associate hunger with only developing countries. However, according to projectbread.org, the Status Report on Hunger in Massachusetts notes that in 2010, 10.8 percent of households were food insecure. That is why MFWH has decided to donate all the funds raised on campus this semester to local soup kitchens, as well as to form a dedicated group of MIT students to volunteer at these local organizations.

If you would like to learn more about MFWH, please email mfwh_exec@mit.edu.

Photo Credit: Ting Mao
A Ticket to India from D.C.
My summer with the Center for Global Development
By Tiantian Zhou

This past summer, I worked at the Center for Global Development (CGD) in Washington, D.C., a think-tank focused on issues of international development.

Like most internships in this area, my employer was not paying for my summer job. Instead, I was lucky enough to get funding from the MIT Washington D.C. Summer Internship Program. As a program participant, I was offered the freedom to choose where I wanted to work, a stipend, free housing, and opportunities to attend various seminars organized jointly by the program and various other organizations in the area.

Another perk was that I learned more Indian state and district names in one summer than I had in my entire 22 years.

My work at the CGD involved providing assistance to some of its ongoing research projects. My main objective was evaluating the impact of Janani Suraksha Yojana (JSY), a conditional cash transfer program rolled out nation-wide in India, where the main scheme encourages women to go to a proper healthcare facility for delivering children. Considering that India has been projected to miss the millennium development goal in maternal health, I was gladly surprised by the existence of such a plan.

I think, contrary to some beliefs, that D.C. has a lot to offer for aspiring professionals in the international development field.

My daily job involved quantitative analysis, data management, and STATA coding (statistical programming) on the effectiveness of JSY. Although my tasks were not always the most exciting, I felt motivated knowing that the impact of evaluations such as mine are critical to creating other programs in the future. Another perk was that I learned more Indian state and district names in one summer than I had in my entire 22 years.

I think, contrary to some beliefs, that D.C. has a lot to offer for aspiring professionals in the international development field. First, the United States is a major donor of international aid and the majority of decisions on how this money is spent are made in Washington, D.C. Despite the fact that foreign assistance only constitutes roughly 1% of the U.S. national budget, this still amounted to a staggering $34.72 billion in 2011 (GPO).
Second, as a corollary to the first point, there is a high concentration of people and organizations in the area that are involved in aid and development. For example, my center was within a 20 minutes' walk from the World Bank, the International Monetary Fund (IMF), as well as the World Health Organization (WHO). Additionally, large NGOs such as Oxfam and development consulting companies such as Chemonics also have offices in D.C.

These organizations sponsor many development-related seminars and networking events that you can easily gain access to just by working in D.C. Finally, working in D.C gives you the big picture outlook on international aid. For example, in what are the big donors interested? Where is the US government heading in terms of international assistance?

You also get a better sense of the criteria by which certain bills or policies related to development either get passed or not. For example, Michael Clemens, one senior fellow at CGD, recently managed to convince the U.S. government to remove the ban on Haitians from obtaining H-2 visas. Immigration, from Haiti and other developing countries in general, is an important part of development and economic growth in those countries.

In all, if you are an MIT student and you are passionate about development and policy-making, you should consider working in Washington, D.C.—and to get a taste for it, check out the MIT Washington D.C. Summer Program for guidance and sponsorship.