

D-Lab Design Challenges

Note: photos describing these projects have been removed for copyright reasons.

Commercial-scale solar drying

- Design fruit dryer that produces commercial scale and quality
- Exact specifications determined by partner
- Lesotho
- Not developed on this scale yet
- DK Pakisi, ATS, Lesotho

Commercial dough kneader

- Reduce bread production labor and time
- Produce up to 500 loaves per day
- Entrepreneurs and bakers in small cities in Lesotho
- Not developed yet
- DK Pakisi, ATS, Lesotho

Cooling without electricity

- Need to keep food from spoiling
- Electricity-free cooling can be used in remote areas
- Useful for market sellers and households
- Some designs already developed—project could be a new design or revision
- ATS in Lesotho, contact in Brazil

Patient-Tracking for Home-Based Care in Zambia

- Tens of thousands of HIV/AIDS patients in home-based care (HBC)
- Paper-based systems
- Design and implement a patient-tracking system
- strong connection to leadership in HBC organizations
- Will DelHagen:

Low Cost Water Testing



Design of a low-cost reliable drinking water analysis kit

- Water treatment needs water analysis
- Design of a low-cost turbidity meter, chlorine and/or pesticides analysis kits
- Strong community partners in Honduras and India
- Marta Fernandez
Sam Davies

Charcoal Extruder



Run-of-the-River Micro Hydro

- Rural electrification
- Generating “islands”
- BBCDC, ATS
- Data collected, VITA
- Matt Zedler



Community Mapping Tools

- Document and share community knowledge of resources, geography, skills, etc.
- Develop interface for community mapping with GPS support
- Generalizable - originally conceived for Rio favelas and island, settlements of Canuanã, Brazil
- Planning stages
- Leo Burd

Keyboard Driver for Native Languages

- Making technology accessible around the world requires easy input in local languages
- “Roll your own” keyboard driver for Windows allows easy custom keyboard setup
- Generalizable - originally conceived for the Inñ language of Brazil
- Planning stages
- Leo Burd

Model house

- New tech is exciting, but significant change is hard
- Model house would incorporate appropriate tech and education to serve as a model for development within a community
- Brazil, Zambia (village)
- Technologies exist; synthesis, education critical
- Leo Burd, Kurt Kornbluth

Water collection

- Collecting and transporting water safely and cleanly is a daily challenge
 - □ Develop a water extraction system – learn why current ones aren't used
 - Provide a means of transporting water
 - Protect well from contamination
- Settlements in TO, Br
- Strong community partners, knowledge
- Leo Burd

Domestic Cocoa Roaster/Grinder

- Reduce labor to prepare *koko* [Samoa]
- [Device to roast and grind cocoa beans]
- Rural households in Samoa
- [New project]
- [Allen Armstrong]

Low-cost X-ray

- Inexpensive, mobile screen for TB
- Film-less x-ray
- □ HIV positive patients in rural Africa (Lesotho)
- □ Research group at MIT currently investigating
- □ Colleen Dunst (Lesotho), Professor Lanza (MIT)

Solar Water Disinfection Container



Colloidal Silver Water Filtration

- Use silver nanoparticles to disinfect water running through a ceramic pot
- Modify surface chemistry or fab technique to keep silver intact during washes and scrubs
- Build on existing collaborations; give people in developing countries access to novel technologies (e.g., polyelectrolyte multilayers)
- Currently 45,000 filters in Central America, Asia, & Africa, none w/ special surface coupling

Ground-nut Sheller/Grinder

- □ Description-To design a low cost device for converting peanuts into Peanut butter
- Location-Chiefdom of Mwape, Zambia
- Current Status-Initial research visit
- Contact-Kurt Kornbluth or Jessica Vechakul

Pedal powered water pump

- Water available in deep wells
- Foot-powered pumps are in use in many parts of the world
- A standard design is needed
 - High efficiency (pedal)
 - Standard construction
- Maya Pedal and Bikes not Bombs are very interested

Pedal powered washing machine

- Hand washing is highly strenuous
- Pedal-powered tumbler could improve comfort and free the hands for other tasks
- Many design options
- Maya Pedal and Bikes not Bombs are very interested

Bicimachina production

- Pedal powered machines can do wonders in rural areas
- Maya Pedal produces a highly successful grain miller / corn husker
- How to produce many of these machines in a small shop using mostly hand tools and old bicycle parts
- Maya Pedal and Bikes not Bombs are very interested

Bridging the Digital Divide – Sustainably

- 68% unemployment, 1 internet connection for 1000 people
- Outsource computer vision work
- TARAhaat, HOC
- prototype

Community Radio Station

- Encourage rural community communication
- □ 50 W FM radio transmitter, station equipment, production software
- SLIET University, Punjab India
- Broadcast – Q&A