SP.721 (D-Lab) Fall 2004
Session #4 notes

Perspectives on Development

This session has three components:

- Stakeholder Analysis (Amy Smith)
- Appropriate Technologies (Kurt Kornbluth) — based on field experiences with Whirlwind Wheelchair;
- "The 3rd Revolution in International Development" —guest lecture by Prof. Mitch Resnick, Associate Professor in the MIT Media Lab.

Stakeholder Analysis

This lecture builds on the role playing exercise and homework from Session #3.

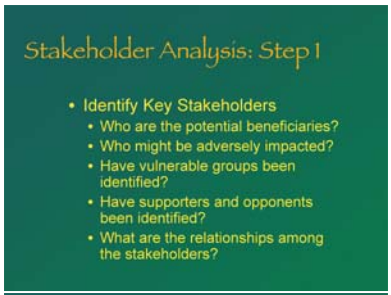
Context

Stakeholder analysis ensures that interested parties that may not have a clear voice, or are vulnerable to the development process in some way, are actually heard and their needs taken into account.

Beyond the obvious direct benefits of a project, the stakeholders' interests include prestige through association with the project, and avoiding losing face (or need to protect against losing face) if the project fails.

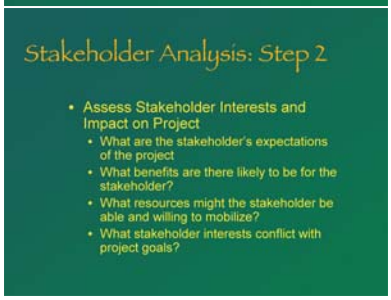
Step 1

Relationships: for example, in order to get Mr. X's support, you need to have Ms. Y also on board; on the other hand, Ms. Z's involvement could make the project break down.



Step 2

See slide.



Step 3

Some stakeholders might be important but do not have much real influence as decision makers – for example, the students in an educational project.

Step 4 – Strategy

Context: You've identified the critical stakeholders and characterized them. Now what will you do with this knowledge? Strategy is based on the understanding gained through steps 1-3.

Appropriate Technologies (Kurt)

When does development become a "four-letter word?" One reason is due to unintended consequences. For instance, about 30 years ago, the U.N. and NGOs convinced Bangladesh to migrate rural water supplies from open groundwater to bore-holes. Bore-holes were considered a good solution for preventing water-borne diseases. The NGOs did not know that a large percentage of these underground sources had toxic levels of arsenic, there was no plan initially for water quality testing, and suddenly huge segments of the population were suffering from arsenic poisoning (arsenicosis). The country is now scrambling to develop safe water supplies.

Facets of Appropriate Technology

Local? While AT has a strong tendency to be locally-based, the resources involved don't have to be completely local-sourced – they only need to be *readily available* locally. For instance, in sub-Saharan Africa, Indian bicycles have been extensively imported. They are cheap and commonplace, so they even though they are not manufactured locally, their parts can be applied to AT projects (like wheelchairs).

Sustainable? Class brainstorms on what constitutes "sustainable."

- Mature
- Ease of use
- Environmentally balanced
- Leaves room to scale up OR down as needed
- Sensitive to existing industries

AT needs to be *compatible* with surrounding/supporting technologies. For instance, much of the world uses 28" wheel bicycles (result of English colonialism) – if you adopt this as standard for your AT project, you'll have much easier time with spare parts, repair, etc.

The core technology should be *proven*. Slide shows example of a Biogas Digester in Zambia, supplies energy for a farm with 250 workers. Waste from latrine goes through anaerobic conversion of methane gas.

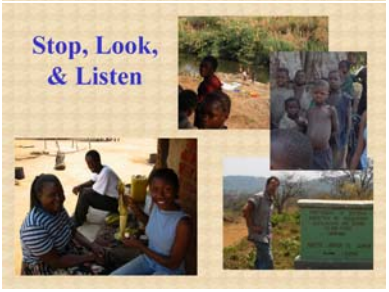
The partners need to have *long-term commitment* to the collaboration. Even if a party can only be there a few weeks per year, that can be enough if the local community can count on their ongoing support.

Objective evaluation can be hard to come by. The slide shows two wheelchairs used in development projects. On the left, a "successful" benefactor has delivered 250,000 chairs per year like this one, but experience shows these chairs break down quickly and are not suited to the local environment in many ways, especially in rural or less-developed areas. The picture on the right is a 4 year old chair manufactured by the Zambian organization Disacare, still in operation (will be studied more in subsequent sessions – case study, lab work).

How are results reported and discussed? *Case studies* are common but can provide a skewed perspective. First, keep in mind that you can get funding just for writing case studies…doesn't necessarily produce the most balanced treatments. Sometimes (e.g. the treadle pump for water) the sheer number and depth of case studies can lead a person that's doing research to over-estimate the success or deployment status of a technology.

"*You may not be smarter than them*." This phrase can be interpreted a couple of ways:

- Beware of bias in favor of formal education; the knowledge accrued over generations of living and working in a given environment and community can be of great value!
- Be open to learning as a 2-way process. Especially coming from an MIT background, you may be accustomed to feeling that you know more than most people.



The 3rd Revolution in International Development: "Designing for Designers" (Mitch Resnick)

Imagine that a community has a lake with fish; you learn about the people, the lake, the fish, and design a great fishing rod for them? That would be OK…for a while. But inevitably, situations change; maybe the lake dries up, the fish populations shift…wouldn't it have been best to invest in helping the local population learn to invent their own fishing solution?

Teaching the design process allows people to continually adapt to their changing needs and changing environment. The solution today may not be the solution tomorrow. Keep in mind that the concept of "building capacity" in a community should be about more than just manufacturing and selling; it should also include design and repair.

Example: Thai Fish Farming Project

Photos courtesy of Roger Sipitakiat, MIT Media Lab. Used with permission.

This picture is from a fish farm in a Thai village. The nighttime light attracts insects (food for the fish). Every evening, a 14 year old girl had to walk 1 km to this light to turn it on; and every morning, she walked back to turn the light off.

The girl was taking a designing workshop at the village school, where she met Roger Sipitakiat, a student in the MIT Media Lab.

Through the workshop, she was introduced to LEGO Mindstorms™ components, including sensors and control capabilities. She had this problem she wanted solved, and built a system with an outdoor light sensor that triggered a Mindstorm controller. It would turn on the black light at dusk when insects are flying, and turn the light off after a few hours when there are no more insects.



The key point in this story is that the 14 year old girl came up with the problem and was also the designer; the teacher (Roger) simply introduced her to some key technologies that enabled her to solve the problem.

Those that do the actual design work find the experience to be quite powerful. Prof. Resnick has been conducting workshops with various "programmable bricks" (LEGO Mindstorms and the latest generation known as "crickets") for 10-13 year old girls from inner-city Boston.

[The class watches a video clip from WBZ-TV news (Boston) showing these students building and testing devices that have real significance for their lives. One student built a sensor-equipped house for her gerbil. She wanted to know what her pet did at night while she slept. She had these questions and was able to invent a means to investigate them.]

Main point: people make the most difference in the world when they're working on things that they truly care about. Giving access to the design process lets people tap directly into this effect.

This viewpoint derives from a *Constructivist theory of learning*. This theory holds that real experience, such as building things, is the best way to learn about the world: "constructing new knowledge by constructing things in the world." In other words, the iterative process of design, build, test and refine supports deep and meaningful learning.

In summary: the best way to address local issues is to involve the local people in the design process for the solution, to empower them to devise and own the solutions.