BigPictureSmallWorld and the Buckminster Fuller Institute in collaboration with Global Education Motivators present

DESIGN SCIENCE LAB

Designing strategies for reaching the United Nation's Millennium Development Goals

A report on the work of the 2007 Design Science Lab
held at the United Nations Headquarters and United Nations International School
New York, NY

The Design Science Lab
New York, NY
June 22nd - 29th, 2007

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The 2007 Design Science Lab (DSL) was directed by Medard Gabel of BigPictureSmallWorld. The 2007 DSL was produced by Elizabeth Thompson of the Buckminster Fuller Institute with coordination and assistance provided by Matt Barron. Special thanks to BFI summer intern Kallie Weinkle.

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2007 Design Science Lab participants atop a basketball-court-sized Dymaxion Map during the World Day evening event.

INTRODUCTION: THE 2007 DESIGN SCIENCE LAB

What is Design Science?

Design Science is a methodology for changing the world. It involves the application of the principles and latest findings of science to the creative design and implementation of solutions to the problems of society. It is a way of recognizing, defining, and solving complex problems that is based on innovation and thrives on transparency. It takes a whole systems, global, and anticipatory approach that fosters creative collaboration and synergy in the development of comprehensive solutions to both global and local problems. It was inspired by the work of Buckminster Fuller and other planners, scientists, and visionaries.

How is Design Science Different from Other Planning Processes?

Unlike many planning and political processes that compartmentalize issues and seek to develop solutions in a vacuum, Design Science stresses comprehensive thinking based on a clear understanding of the state of the world, available resources, appropriate technology, culture, environmental constraints, and the interconnections between world problems and opportunities. The Design Science planning process provides a framework for devising solutions to current problems as well as anticipating future needs.

Design Science is also different from other problem solving and planning methodologies in its comprehensive, anticipatory, inclusive, and transparent approaches to the development of solutions. It takes a 'whole to particular' approach that is both global in perspective and in its examination of options. It seeks to build capacity rather than merely solve problems, and to develop solutions that are transformative rather than merely the reforming of already inadequate systems. It is informed by a moral vision that places a priority on designing ways of meeting unmet basic human needs in ways that are environmentally sustainable and socially just.

The core of this approach to problem solving and planning is both a concern with whole systems—the whole Earth, the entire history of the planet, the global economy, all of technology, and all of humanity; both those living now and those yet to be born —as well as a recognition that everything is implemented locally, and that the "whole" is merely the context for the local. Design science has both a global perspective and a local focus. It is the local upon which the success or failure of a particular design solution will thrive or die.

Design Science is comprehensive, in that it starts from the whole system and works back to the special case. It deals with all facets of a problem including the larger system of which the problem is a part; in this sense, design science seeks to build capacity, not just solve problems. It is anticipatory, in that it seeks to recognize the threats coming down the pike before they arrive full blown on an unsuspecting or ill-prepared society; and it deals

with the way things are going to be when the solution is going to be implemented, not just the way things are in the present. It is a design strategy, in contradistinction to a political or 'let's pass-a-law-and-change-human-behavior' approach; it seeks to change the larger system of which the specific problem is a part through the introduction of innovative artifacts or policies.

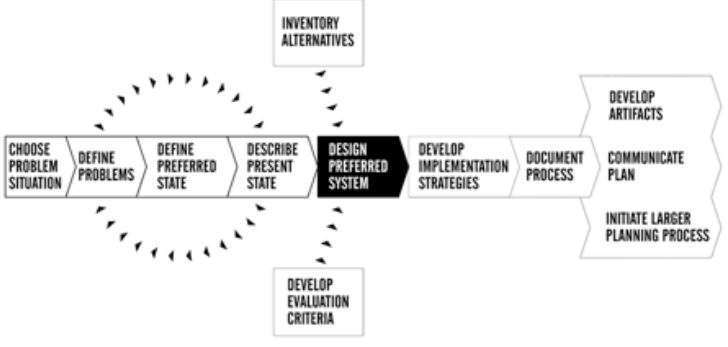
This "comprehensive anticipatory design science" is at least as much a perspective on the problems of the world as it is a methodology for tackling those problems. When applied to contemporary problems, it can lead to strikingly fresh insights and solutions.

Design science is a tool that is based on a global perspective and a systems approach to the problems of the world. It assumes that globalization has made the world an ever more interconnected whole, and any successful problem solving of society's systemic ills needs to be an approach that is global, comprehensive, visionary, and based on science, not politics, ideology, or wishful thinking. The entire world is now the relevant unit of analysis, not the city, state, or nation. We are onboard, as Buckminster Fuller pointed out, "Spaceship Earth," and the illogic of 200+ nation state admirals all trying to steer the spaceship in different directions is made clear through this metaphor—as well in Fuller's more caustic assessment of nation states tending to act as "blood clots" in the world's global metabolism.

The design science process is augmented by vast quantities of statistical information about the state of the world, its resources, human trends, needs, and technology. With the advent of personal computers and the Internet this information became almost universally available—and with it, design science found its perfect complement. Coupled with the tools of the information age, design science gains the power to reach its potential. The Internet has not leveled the global playing field so much as expanded it, and the good-ol'-boy-status-quo-maintaining political process can now be subverted by a process that brings Thomas Jefferson into the twenty-first century.

In Fuller's words, design science is a process where individuals or teams of people can "make the world work, for 100% of humanity, in the shortest possible time, through spontaneous cooperation, without ecological offense or the disadvantage of anyone."

Making the world work for 100% of humanity reflects Fuller's global perspective as well as his values. We are not here just to make ourselves rich, famous, or top consumer of the day or decade, or



The design science planning process

here just for the 5% living in our part of the world; we are here for all humanity. The "spontaneous cooperation" is instructive in light of the previous discussion. The phrase does not read, "make the world work for 100% of humanity through a central government, or through enforced coercion by a strong military" but through a cooperation that arises from a fundamental transparency of society and its needs. If everyone knows what the situation is, has a clear vision of what should be and what needs to be done, we cooperate to get it done—as we do as a society in times of emergency.

Fuller said: "I am enthusiastic over humanity's extraordinary and sometimes very timely ingenuities. If you are in a shipwreck and all the boats are gone, a piano top buoyant enough to keep you afloat that comes along makes a fortuitous life preserver. But this is not to say that the best way to design a life preserver is in the form of a piano top. I think that we are clinging to a great many piano tops in accepting yesterday's fortuitous contrivings as constituting the only means for solving a given problem."

Design science is a method for developing the life preserving and enhancing solutions to society's problems.

—Medard Gabel, BigPictureSmallWorld

What is the Design Science Lab?

The Design Science Lab is an intense, sometimes exciting, sometimes overwhelming, workshop—where the tools of design science are used by diverse groups to develop creative solutions to global and local problems and strategies for the implementation of those solutions. The Lab uses as its general frame of reference the United Nations Millennium Development Goals, a set of ambitious, but attainable milestones that, if implemented, will lead to a healthier, happier, more just, and more sustainable world by 2015. It is our intention to hold at least one Design Science Lab each summer between now and 2015 that will focus on the development of strategies for achieving the UN Millennium Development Goals.

The first Design Science Lab took place in 2005 in New York City at the United Nations and the United Nations International School. It included 25 high school and college students as well as working professionals ranging in age from 14 to 42. The participants in this Lab focused on addressing the UN Millennium Development Goal #1 – to reduce by half those living in hunger and poverty by

The UN Millennium Development Goals

Goal #1: Eradicate extreme poverty and hunger
Goal #2: Achieve universal primary education
Goal #3: Promote gender equality and empower women
Goal #4: Reduce child mortality
Goal #5: Improve maternal health
Goal #6: Combat HIV/AIDS, malaria and other diseases
Goal #7: Ensure environmental sustainability
Goal #8: Develop a global partnership for development

2015. Their 11-part strategy for doing this can be downloaded free of charge or purchased in book form from http://www.designsciencelab.org.

Eliminating Hunger, a short movie that presents the work of this Lab, can be viewed at http://www.bigpicturesmallworld.com/movies/hunger/hunger1.html

The second year of the Design Science Lab replicated the global approach of the first lab, but also took the principles of the Lab to the local level. The Lab was conducted again in New York City from June 21st through 30th at the United Nations and the United Nations International School. It had 55 participants ranging in age from 15 to 60. This year's group focused primarily on the Millennium Development Goals 2, 4, 5, 6 and 7 dealing with issues of global education, health, the environment, and energy. In addition to the New York program, the Design Science Lab was also held at the University of North Carolina in Asheville, NC from July 18th to 28th. This Lab focused on the development of solutions to these "global" problems that can be implemented locally. Its 40 participants ranged in age from 14 to 73 and brought to the program their diverse interests and experiences. Each of these Labs had a separate written report. These can also be downloaded free of charge or purchased in book form from http://www.designsciencelab.org.

The 2007 Design Science Lab also took place at the UN and UN International School in New York City. It ran from June 22nd through June 29th and focused primarily on the Millennium Development Goal #1—the eradication of extreme poverty and hunger. Our efforts were focused on reducing by half the proportion of people living on less than a dollar a day.

Lab participants were briefed by UN staff from the UNDP, UNEP, The Millennium Development Campaign, UNESCO, UNICEF, DESA and others on the MDGs, their context, history, measurement, the progress made so far, and strategies in use for reaching them. The introduction to design science and the Lab portion was conducted by Medard Gabel at the UN International School. Lab participants typically worked eight to twelve hours a day.

On the last day of the Lab, participants returned to the where they concluded the Lab with a presentation of their work to UN staff. An overview of this work is what is presented in this report.

The 2007 Design Science Lab participants tour the United Nations Headquarters in New York City.

The Design Science Lab is a joint effort of BigPictureSmallWorld and the Buckminster Fuller Institute, in collaboration with Global Education Motivators. BigPictureSmallWorld provides facilitation and the curriculum for the program. Global Education Motivator's serves as the program's United Nation's host and provider of U.N. participants. The Buckminster Fuller Institute is the program's producer. Lab Teaching Assistants were Daniel Eida, Michael Khayyat, Zoë Richards, and Natasha Cline-Thomas.

The goals of the Design Science Lab are to:

- Learn about the Millennium Development Goals, their usefulness to the world, and how we can use them to make the world a better place
- Develop viable strategies for achieving one or more Millennium Development Goals
- Learn design science and how to apply it to global and local problems
- Increase our understanding of global dynamics, world resources, human trends and needs, and options for humanity's success
- Increase the public's understanding of these issues through disseminating the strategies as widely as possible
- Serve as an incubator and growing force for developing and disseminating design science techniques for complex problem solving and development of viable solutions to the worlds problems
- Learn a methodology for changing the world.

DESIGN SCIENCE LAB PROGRAM SCHEDULE

Friday, June 22	5:00 to 6:30pm	Welcome/overview/agenda/ground rules; Introduction to DSL, MDGs and Global Poverty
	6:30 to 7:30pm	Ramu Damodaran, Chief/Civil Society Section, UN Department of Public Info.
Saturday, June 23	9:00am to 12:00pm	Introduction to Design Science
	1:00 to 5:00pm	Design team formation; warm up activities; preferred state, problem state, present state
	6:30 to 8:00pm	Evening program - The Legacy of Buckminster Fuller
Sunday, June 24	9:00am to 5:00pm	Applied Design Science - the approach of the Design Science Lab
	6:30 to 8:00pm	Evening program
Monday, June 25	9:30am to 4:45pm	Global Poverty panel discussions 1, 2, and 3 with UNDP, DESA, UNEP, etc.
	5:00 to 6:00pm	Day's summary, discussion
	7:00 to 9:00pm	Evening program
Tuesday, June 26 to Thursday, June 28	10:00 to 10:30am	Day's agenda and goals
	10:30am to 4:00pm	Design teams
	4:00 to 6:00pm	Day's summary; design teams report
Friday, June 29	9:00 to 11:00am	Final preparation for presentation to the United Nations
	11:00am to 12:30pm	Presentation run through
	1:30 to 4:00pm	Presentation to the United Nations
	5:00 to 8:00pm	Closing ceremony and celebration


Peace Please
WIRELESS

STRATEGIES

We are proud to present the work of the participants of the 2007 Design Science Lab. In the pages that follow are the seven strategies designed to move the world towards a more sustainable future utilizing technology, resources, and know-how available today, right now.

Buckminster Fuller asked,

"if success or failure of
this planet and of human
beings depended on how
I am and what I do...

How would I be?

What would

I do?"

These inspired and inspiring individuals have answered, crafting a vision for a better world.

This is that vision...

WATER = LIFE

Brett Boye, Briana Graves, Iman Griffin, Kevin Machoka, Susan Moore, Thomas Pang, Ben Pullman, Alex Reiner, Ivan Serezhin

Strategic summary: The Water = Life group chose to focus their work on an aspect of poverty that isn't often discussed - water poverty. Water is an essential part of life, and one that is all too scarce for many people around the world. This group has worked to create a plan to provide abundant, clean water to as many people as possible, relying on locally-devised and culturally-appropriate methods of storage and distribution that can be scaled up to meet the needs of individuals, small villages, towns, and even cities.

Present State of the Global Water System

- Of all water on earth, 97.5% is salt water, and the remaining 2.5% is fresh water. 70% of the fresh water is frozen in the polar icecaps. The remaining 30% is mostly present as soil moisture or lies in underground aquifers. So less than 1% of the world's fresh water is readily accessible for direct human uses[1]
- More than half of the world's fresh water is found in Latin America (31%) and Asia (27%)
- An estimated one billion people worldwide have little or no access to clean water and 6,000 children die every day because of infections linked to unclean water, according to UNICEF[2]
- Most of those affected by lack of access to clean water live in Asia (550 million) and Sub-Saharan Africa (400 million). Asia is making progress toward improving these statistics, while Africa is falling far short of the MDG target[3]
- Lack of clean water for cooking and basic sanitary needs leads to disease and poor health
- Rural communities are 50% more likely than urban communities to lack basic sanitation
- Fantastic successes have been realized in reducing the prevalence and spread of water borne diseases such as Guinea worm
- Purification and desalination both require enormous energy inputs
- Agricultural processes account for 70% of fresh water use globally[4]
- In African and Asian regions where agriculture is the primary source of income, droughts are devastating to both human health and the economy
- According to a study conducted by the United States Department of Defense, dwindling supplies of fresh water and climate changes worldwide could fuel resource wars[5]

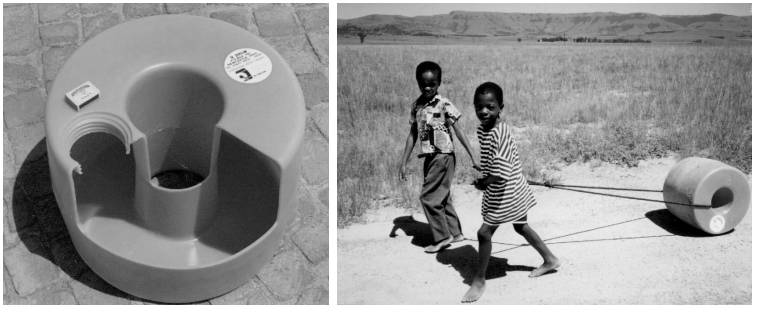
Preferred State of the Global Water System

Affordable, clean, efficiently used and distributed water is available for all people

This means:

- Reducing pollution to both freshwater and seawater worldwide. This will not only improve potable water supplies, but improve ecosystems as well
- Devise better water collection, storage, and distribution systems, especially in less developed regions
- Utilize emerging, appropriate technologies such as the Lifestraw and the Q-Drum that enable water to be purified and transported (respectively) at the source on a human scale
- Meet or exceed the World Health Organization's (WHO) minimum levels for the quantities of drinking water:
  1 liter water/day for a 10 kg (20 lb) child
  2 liter water/day for a 60 kg (130 lb) adult[6]
- Promoting local education initiatives focusing on daily water needs, disease prevention, storage and collection procedures, and water conservation

The Lifestraw is an example of a simple, affordable, mass-produced solution to problems like the spread of water-bourne diseases. Lifestraw uses a series of filters, iodine, and carbon to remove impurities and parasites from water.



The Q-Drum addresses the needs of people in less developed regions to transport water, often over long distances and rugged terrain in hot, dry weather. The Q-Drum reduces physical strain and prevents loss of water during travel using a unique design and durable materials.

How Do We Get There?

Water Collection Kit

- A 55 gallon barrel will include all the supplies needed to create four 10x10 foot water collection and storage kits.
- In the first phase we will create and ship 1250 kits with a total of 5000 collection and storage set-ups.
- PVC pipes can also be used as part of the drip irrigation system in the long term.

Cost and Components

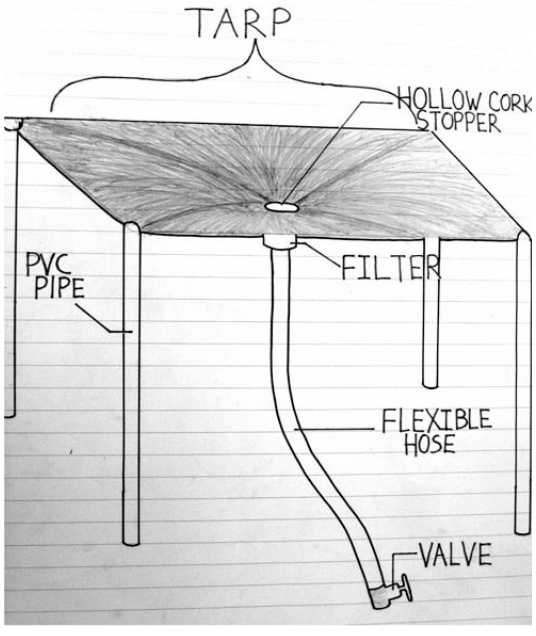
- Each Kit will cost approximately $100 retail and include:
  - 1 Plastic 55 gallon barrel
  - 4 10 x 10 tarps
  - 32 3-foot PCV pipes
  - 4 filters
  - 4 flexible hoses
  - 1 bag heavy rubber bands
  - 4 PCV valves
  - 4 siphon pumps
  - 4 heavy duty plastic liners
  - 4 hollow cork stoppers

Short Term Goals

- Provide additional water for 5,000 people.
- Create a design solution for under $100 per kit.
- Create a short term solution that can be expanded to meet long-term needs.

Long Term Goals

- Provide Irrigation kits for the pilot villages (2nd year)
- Build permanent storage systems (5th year)
  e.g. – using recycled materials that are often wasted
- More sophisticated pumps (5th year) solar or wind
- Possible addition of composting toilet systems if culturally acceptable



Collection

A kit containing a 10 x 10 inch tarp can collect enough water for approximately 100 days of personal use for one individual.

Tarp Size (feet)	Potential Water Collected (gallons)*
10 x 10	498.67

*for every 8 inches of rainfall

Storage

- Trenches that hold water in large plastic bags are already being used in India
- These containers hold 500 or 1000 liters of water
- The trenches also serve to keep water cooler in hot summer months
- This storage method could easily be translated elsewhere

Irrigation

- Any extra water collected can be used for drip irrigation in times of drought. This method of irrigation is extremely efficient and little water is wasted
- The plastic tubing included with the kits is well-suited for drip irrigation

Example of a small water storage trench in India

A simple drip irrigation system utilizing components similar to those found in the kit

Human Resources Needed

- Start-up Phase
  - One Project Manager
  - One Communications Manager
- Deployment Phase
  - Team of 6 trainers to teach initial set up and use on site

What Can the U.N. Do?

- Deploy representatives - UNICEF
- Provide funding - UNDP
- Media awareness - UNFPA

What Can Businesses and Individuals Do?

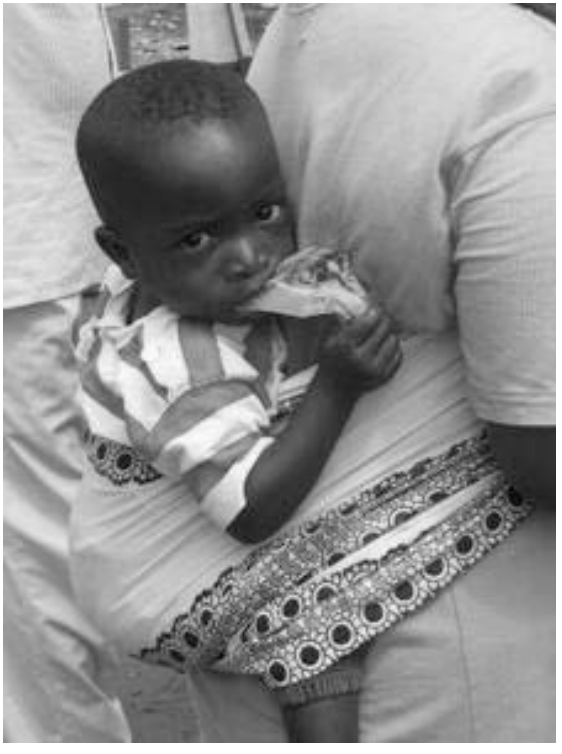
- Form strategic partnerships with hardware stores (e.g. Home Depot) to provide free or discounted kit components
- Individuals shopping in these stores can provide a 'physical donation' (an actual component of the kit) and put it directly in the 55 gallon drum to be shipped out. This way, people feel a sense of ownership in the process and see exactly what they're giving

Making it Real

- We need committed fund raisers or volunteers to manage the project for the first year
- Students (e.g. those from UNIS) can raise awareness within their school, encourage donations and create fundraising events

Project Summary

- The proposed design will provide water for 5000 people
- 1250 Kits will be used to provide 2.5 million gallons of potable water for personal use
- Our system will be aiming to provide affordable, clean, efficiently used and distributed water by 2015



MORINGA IN MOTION

Brent Jones, Michael Khayyat, Karen Lau, Lexi Quint, Zoe Richards, Alex Rinomato, Pollan Wong

Strategic Summary: The Moringa in Motion group focused their work on the moringa tree, a fast growing, drought-resistant plant with highly nutritive leaves and the potential to be used in a number of small and large-scale industrial processes. The group's strategy involves creating seed banks and demonstration farms in villages where local farmers can come to get moringa seeds, learn about the plant, and deposit extra seeds for others to use. They hope to scale up these seed banks/demonstration farms to a regional level after a pilot program. In addition to the seed banks, they hope to encourage people to take advantage of the byproducts of moringa for use in other ways. The stems, seeds, and leaves of the moringa tree can all be processed into useful byproducts and sold on local or world markets.

Present State of Wealth and Health in Less Developed Regions

- In most less developed regions there is often a general lack of:
  - infrastructure/transportation/roads
  - communication tools (i.e. internet connectivity)
  - access to capital
  - adequate supplies of food/water
  - training/resources/education
  - accessible and affordable healthcare
  - small business opportunities
- 1.37 billion people live on less than $1 per day[7]
- 800 million people are chronically malnourished and approximately a third of the world's population lack food security
- 30% of children between the ages of one and five are underweight according to international standards[8]
- 203 million people are malnourished in sub-Saharan Africa
- An analysis of long-term trends shows the distance between the richest and poorest countries was about:
  - 3 to 1 in 1820
  - 11 to 1 in 1913
  - 35 to 1 in 1950
  - 44 to 1 in 1973
  - 72 to 1 in 1992[9]
- Micro loans are allowing some people opportunities to start small businesses and gain an income. However, the existing programs are not widespread enough to be effective on a large scale large enough to eliminate the problem
- Many farmers in less developed regions are forced to grow cash crops like cotton and rubber to supply raw materials to global markets. This can reduce food output and lead to soil erosion

Preferred State of Wealth and Health in Less Developed Regions

By 2027:

Eradicating poverty in both urban and rural areas by facilitating the creation of local businesses that:

- Are sustainable, ecologically-sound, regenerative
- Have access to capital for further expansion
- Have access to adequate infrastructure
- Have access to training programs
- Are run by and employ locals
- Are as locally sourced in terms of resource use and other inputs as possible
- Are connected/networked with urban areas
- Provide affordable/free healthcare for employees
- Create artifacts that help meet the basic needs of the community using surrounding resources
- Are able to connect globally via export/trade
- Create a globally networked world where people have internet communication access to the outside world, where resources are shared, and motives and operations are transparent

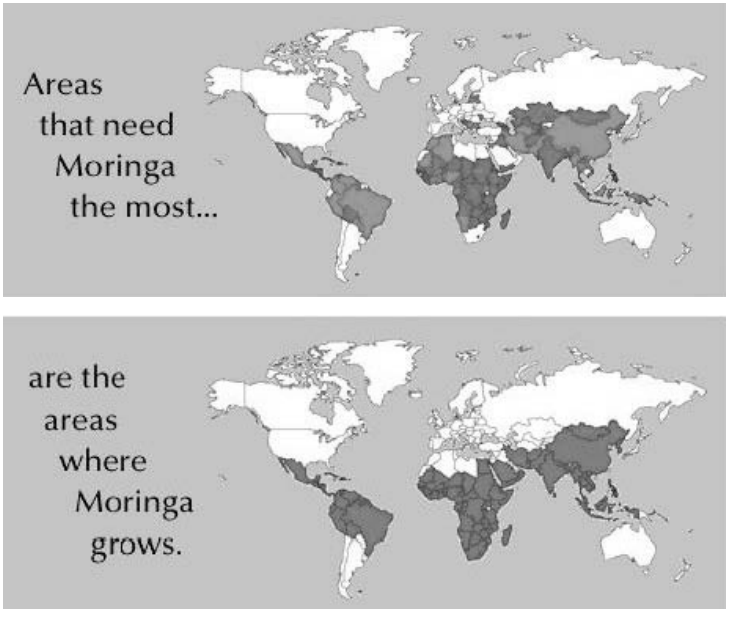
Project Goals

By 2027, the following goals need to be met in order to consider this project a success:

- A large thriving market for the products produced from the moringa tree
- 10,000 moringa seed banks distributed throughout India
- Unemployment rate reduced by 75%

The Moringa Tree

Moringa is a tropical multipurpose tree. It is resistant to drought and is fast growing. It also has a variety of uses from nutritional to industrial and can be marketed in the form of a number of different products, from cosmetics to food supplements. Moringa is raising a growing international interest among NGOs, scientists and the private sector.



The above shows the overlap between where moringa is needed (areas with large numbers of malnourished people and struggling local economies) and where moringa grows.

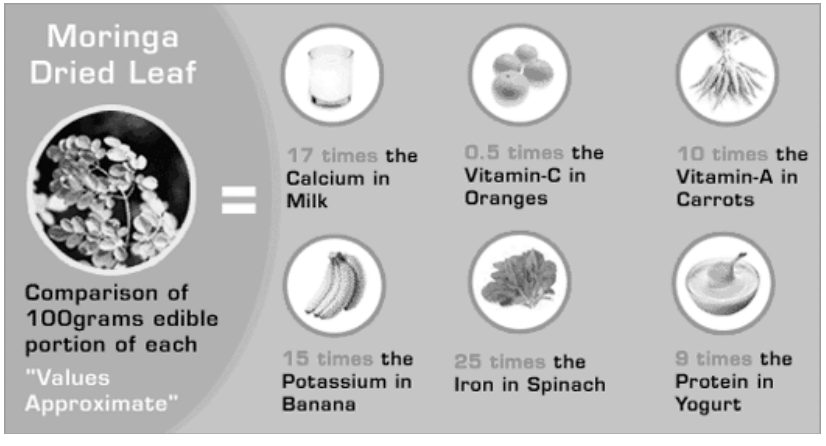
Moringa Uses and Products

Aside from the ease of growing and cultivating moringa and its nutritive properties, the tree provides a number of other benefits.

Nutrition

One rounded tablespoon (8 g) of leaf powder will satisfy about 14% of the protein, 40% of the calcium, 23% of the iron and nearly all the vitamin A needs for a child aged 1-3. Six rounded spoonfuls of leaf powder will satisfy nearly all of a woman's daily iron and calcium needs during pregnancy and breast-feeding.[10]

Moringa leaves can be easily dried (in the shade to reduce loss of vitamins) and rubbed over a wire screen to make a powder, which can be stored and conveniently added to soups, sauces, etc.



Water Purification

One hundred kg of moringa seeds will produce about 1kg of polyelectrolyte, a chemical compound which is used for water filtration; powder from ground-up seeds and also the presscake left over from the extraction of moringa oil can both be used for the treatment of turbid, dirty water.[11]

Treatment of water with moringa is by no means a fail-safe measure, but where other methods are not available (or too

costly), moringa is a great alternative and certainly better than drinking untreated water. This has been supported by a number of scientific studies.

Antibiotic

A compound found in the flowers and roots of the moringa tree, pterygospermin, has powerful antibiotic and fungicical effects.

Fresh Food and Drink

The young pods, when cooked taste like asparagus. They are sold fresh and canned in many Asian markets. Tinned drumsticks are exported from India, Sri Lanka and Kenya to Europe and Asia. They are eaten much like green beans.

After about 8 months, the tree begins to flower and continues to flower year round. The flowers can be eaten or used to make a tea. In Haiti tea from the flowers is considered a

powerful cold remedy. The flowers provide good amounts of both calcium and potassium.

Moringa seeds can be extracted and eaten as "peas" (boiled or fried) when still green. The mature seed is about 40% oil. Moringa oil is of excellent quality for cooking. It is used in cooking, perfumes and as a watch lubrication. It is used for making soap and - when burned in lamps - for light as well. The oil is slow to become rancid.[12]

Strategy

This strategy takes place in three stages, starting with Phase 1 in 2007 proceeding through Phase 3 in 2015.

Phase 1

The first phase of the Moringa in Motion strategy will function as a pilot program to determine what works, what needs adjustment, and what aspects of the project may not work in a given location. A target village will be identified for the pilot program and provided with:

- Moringa seeds
- Fertilizers
- Basic training in moringa cultivation as part of an Agricultural Resource Center (ARC), which will also provide basic information about a number of other local staple crops, water management and conservation training, and communications infrastructure (i.e., phone line, internet connection - if needed)
- Creation of a growers cooperative network linking farmers from the village and region to markets and to each other to share knowledge

This phase will also be the first attempt at growing, marketing, and selling moringa products. The first product identified is Morgina leaf powder.

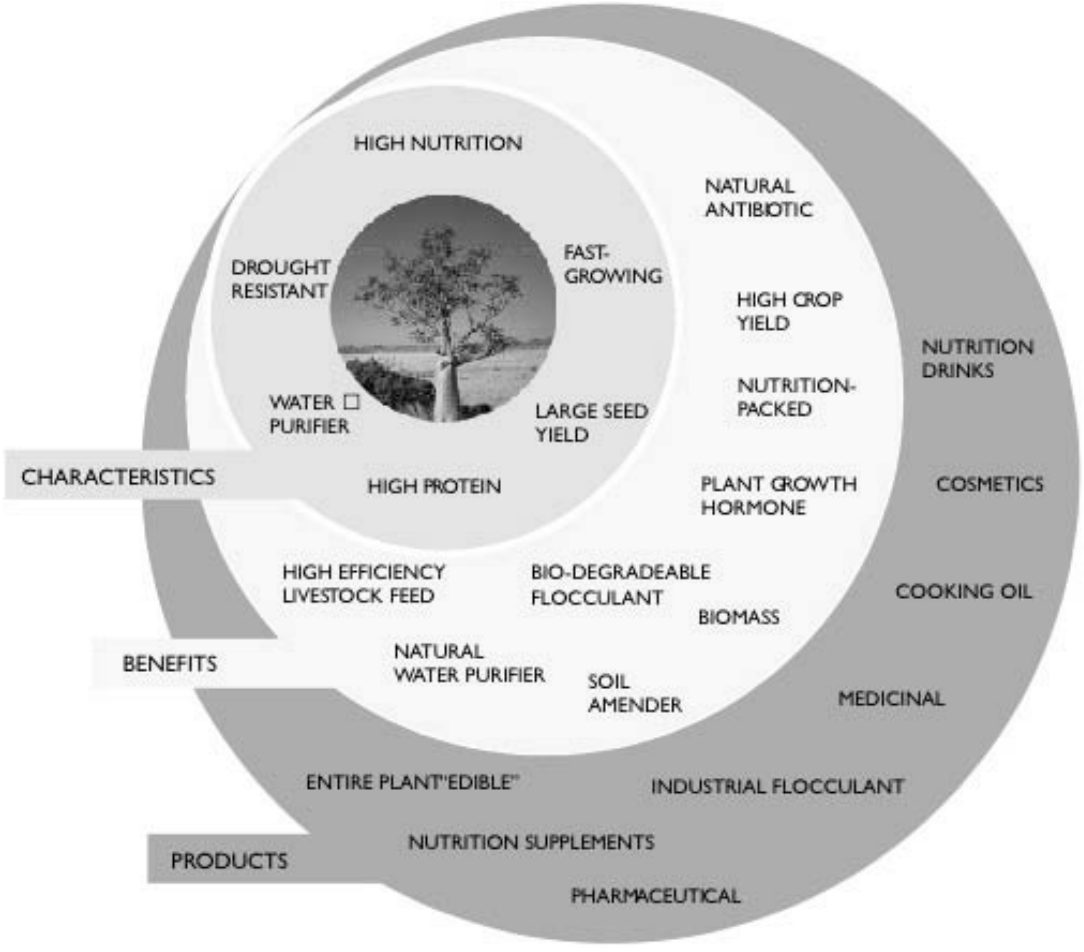
Once the pilot portion of Phase 1 is well-established, the project will be expanded to several nearby villages and the networking aspects of the strategy will begin to develop.

This will be accomplished by establishing additional ARCs with transportation and communication links in the surrounding markets. In this way, a small, regional market for moringa seeds, byproducts, and cultivation know-how will be created as well as a support system for general agricultural needs.

Phase 2

Following the initial pilot program and its regional expansion, the Moringa in Motion strategy will enter Phase 2. This will be a scaled-up expansion with a focus on broadening the market, expanding into other moringa product sales areas, and pursuing larger-scale manufacturing of moringa products. Several components of this phase are:

- Expanding the reach of existing ARC centers and building additional regional centers
- Drawing foreign investment into local moringa production efforts to expand production, begin global marketing initiatives, and create a brand



As depicted above, the moringa tree and its various parts can be used in a variety of ways to address poverty in all its forms and manifestations. While the most pressing need for the moringa may be as a source of food, the tree fulfills numerous secondary roles from water purification to fertilizer production. The moringa tree alone cannot solve the problem of poverty in less developed regtions, but it will provide a solid foundation for health and wealth to build from.

- Expanding seed collection and distribution for water treatment

Phase 3

The primary goal of this phase of the strategy is to move moringa production towards a self-sustaining endeavor, decreasing and eliminating the need for foreign capital and other assistance and placing the entire operation in the hands of locals. This phase will focus on expanding the market for moringa products, investing in more and better infrastructure linking villages producing moringa to market centers, and investing profits from the enterprise directly into social support and services such as healthcare, education, and job training.

The ability of this strategy to be scaled-up dramatically is one of its greatest strengths. Please see the images on the following pages for representations of this scaling process.

Projected Costs

PHASE 1: STARTUP COST

- (1 Agricultural Center + Outpost Network)
- Staff: Agricultural Extension Agent knowledgable in moringa cultivation, product development, and marketing
- 3 Bikes
- 1/2 ton fertilizer/farm
- 2,000 seeds/farm
- 2 oil presses
- Packaging
- Water Management Tools + Techniques
- Main Agricultural Center
- Outposts/Storage Center

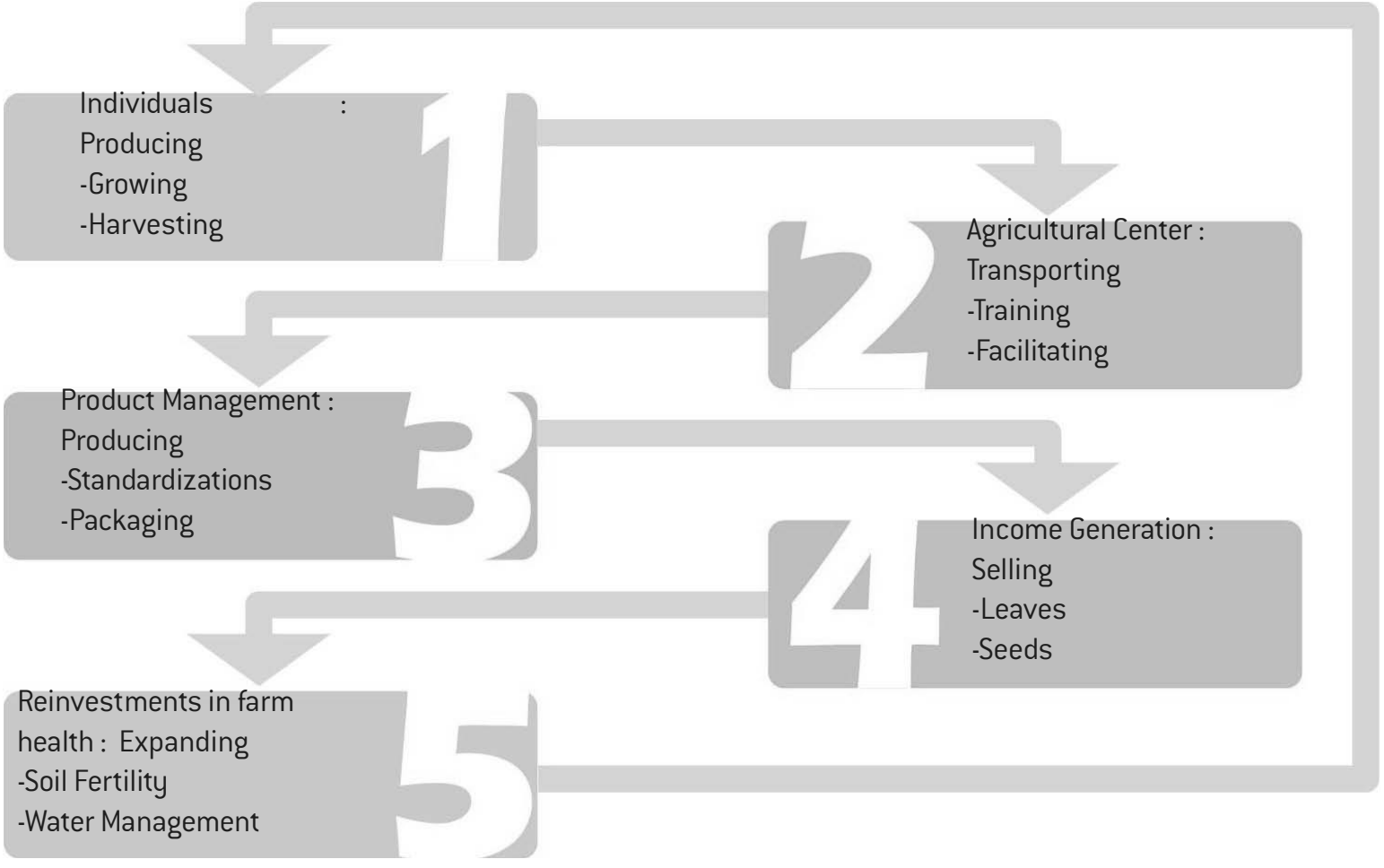
$165,000.00 ($300.00 /acre of farmland)

YEARLY COSTS:

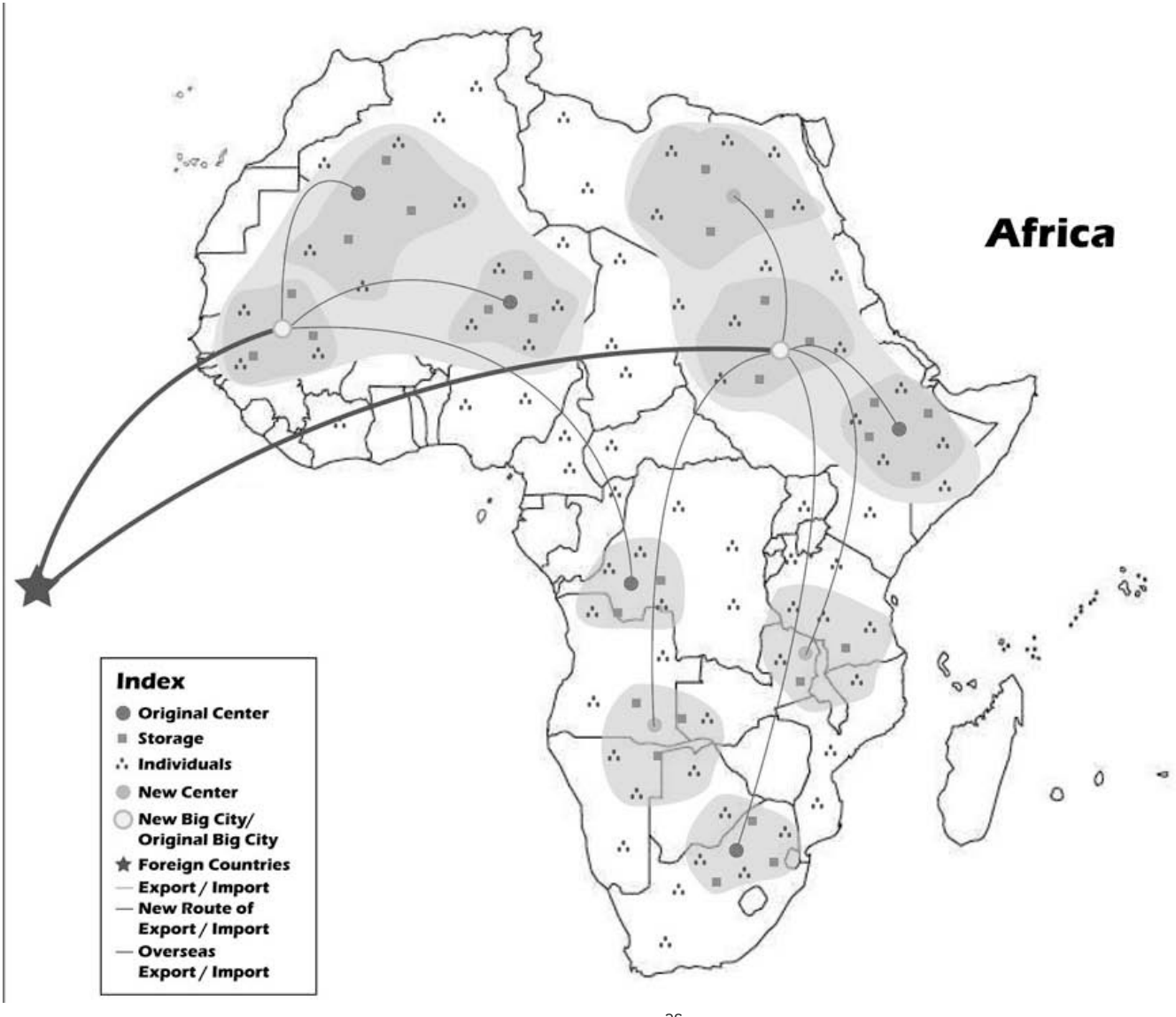
Labor Cost:

- ($30.00 /day labor for two local farmers X 260 days of labor) = $15,600.00 labor
- Ag Extension Agent = $25,000.00

$40,600.00



Long-term plan for the expansion of moringa-based enterprises.


Africa
Index
Original Center
Storage
Individuals
New Center
New Big City/
Original Big City
Foreign Countries
Export / Import
New Route of
Export / Import
Overseas
Export / Import

From

UNITED NATIONS

- Provide seed funding, create farmer incentive from WFP/UNICEF
- WFP can buy this product to decrease malnutrition significantly

CIVIL SOCIETY

- People can buy the product and/or increase the awareness of Moringa
- Development of moringa production in developing countries

BUSINESS

- Market expansion (increasing production and distribution + awareness channels)
- Then energy market in the US alone is upwords of $200 million. If we captured only 1% of this market with moringa products that would be $2 million.

INDIVIDUALS

- Support for development of moringa production in developing countries

LIVING WAGE FOR ALL HUMANITY

Aruna Arjunan, Zeynep Arhon, Dustin Feider, Don Whilsmith, Mael Jaffres, Kyle Fedus, Lucas McConnell, Angela Fuller, Gonzague de Raulin

Strategic Summary: The Living Wage group developed a strategy to create 500 million living wage jobs by the year 2015 using a set of economic development strategies designed to exponentially increase wealth throughout the world. The plan has three stages that follow economic development phases, starting with small prototype farms growing the "three sisters" crops (beans, squash, and corn), then moving into production-ready crops such as agave and hemp, and finally moving into larger-scale industrial algae farming to produce byproducts such as ethanol and oil.

Present State of Employment and the Global Economy

- 19% of world population lives in extreme poverty
  - 1.25 billion people live on $1/day or less
- 62% of world population lives on $2 or less a day
  - 2.8 billion people get by on $2 a day or less[13]
- Poverty is mostly concentrated in Sub-Saharan Africa: 44% of the population lives in extreme poverty
- Individuals, NGO's and governments tend to focus on symptoms of poverty without looking at the bigger picture
- There are a number of political, social, religious, cultural, environmental, and economic barriers to people-centered, people-powered development in much of the world.
  - + Social – racism, domestic and international violence, hunger, lack of "win-win" options– general sense of apathy and powerlessness
  - + Economic – poor health (diseases), unsustainable systems, unstructured economies, shortage of revenue (cash flow), foreign and national subsidies that distort local markets
  - + Political – corrupt businesses, political instability, lack of transport (roads and ports)
  - + Cultural – religious tension, lack of perspective to cooperate
  - + Environmental – depleted soil, resource competition, industrial pollution and subsequent public health consequences

Preferred State of Employment and the Global Economy

By 2015:
500 million additional people will make a living wage.
By 2027:
1.29 billion additional people will make a living wage (thereby reducing to 0 the number of people living on $1 or less per day)

Overall Goals

- A world without poverty
- Everyone has a job with a living wage
- A system that allows big business to create economic value on a local level
- Meaningful employment, and economic evolutionary opportunity (the capacity for personal and regional economic advancement)
- The attraction of global investment
- Creation of family and village level production capacity, employment and a living wage.
- A sustainable system of farming which allows for the saving of seeds, continued improvements to the soil, intercropping and mulching.
- An agricultural middle class with small scale organic vegetable farming and algae farming at any scale.
- Creation of infrastructure and infusion of wealth spurs additional enterprise.

Phase 1: Regeneration Kit (Farm-in-a-Box)

The initial artifact that will be required is a kit to help the small farmer to develop a small area of land in such a way as to be ever expanding and self-replicating. The farming methods that have been promoted by global trade rules and some economic policies in the less developed world have led, in many places, to degraded soils and polluted water supplies. In particular, the focus on growing cash crops like cotton and raising livestock has led to a number of problems such as:

- loss of forests and grasslands to make room for grazing livestock or farm plots
- lack of locally edible agricultural products
- deterioration of soils
- monoculture food production susceptible to disease or attack by pests
- pollution from industrial fertilizers and pesticides
- soil erosion

In order to help farmers move away from these destructive agricultural practices, the kit distributed in the pilot portion of this strategy (phase 1) will be largely focused on revitalizing traditional and cultural practices and imparting knowledge about regenerative, permaculture farming.

Farm in a Box

Beyond instruction the kit will contain basic supplies including the seeds and equipment necessary to begin to implement the program. Through simple design and ingenuity, hand tools such as the rake can be made from local materials. The rake is a tremendous tool for the small-scale farmer. The ability to gather organic material for mulching the land can greatly improve the water retention and the fertility of the soils.

This first phase of the project will be focused on providing the know-how, the money, and the materials to grow three crops - beans, squash, and corn, commonly known as the 'three sisters.'

The three sisters crops have been grown together for thousands of years by Native Americans and demonstrate principles of permaculture. Not only are these crops nutritious, relatively easy to grow, and beneficial to soils, but they can also be sold on regional and world markets to provide income and a host of employment opportunities (i.e. growers, transportation, supply vendors, etc.).

Phase 2: Hemp Bootstraps

Once a demo project has been successfully set up and at least 30 pilot programs are underway in various villages, the next phase of the project will be to transition to new crops such as hemp and agave that will provide raw materials for small-scale manufacturing.

In hemp varieties grown for seed or fiber use, the plants are grown very closely together and a very dense biomass product is obtained that is rich in oil from the seeds and fiber from the stalks. These plants are also low in THC content (EU and Canadian regulations limit THC content to 0.3% in industrial hemp).

Experts estimate that hemp industries could generate $500 billion to a trillion dollars per year in economic product and benefits - if allowed to flourish without government interference.

Some common uses of hemp include: textiles & fabrics, fiber & pulp paper, rope, twine & cordage, art canvas, paints &

varnishes, lighting oil, biomass energy, medicine, food oils & protein, building materials & housing.[14]

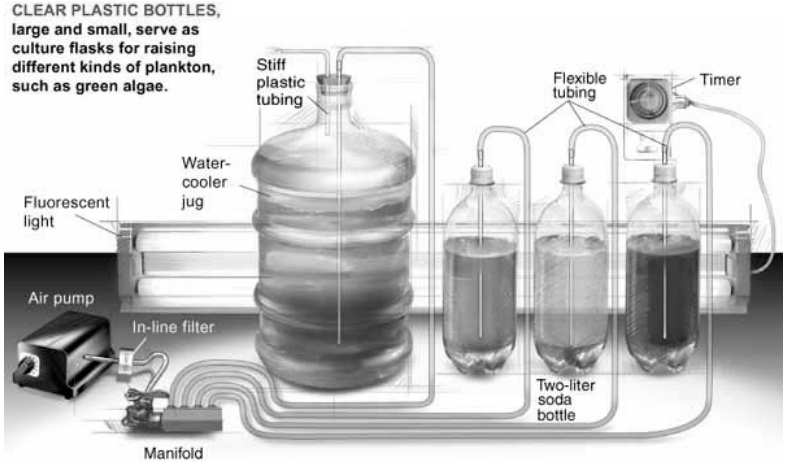
Phase 3: ActionAlgae

The third phase of this strategy is to expand from the base of subsistence agriculture and the value-added semi-industrial agricultural production of hemp fiber to more information- and resource-intensive algal culture and large-scale manufacturing.

One acre of algal production can yield 136,000 pounds of algae. This can be converted to:

3,500 gallons of Fuel Oil 4,500 gallons of Ethanol 78,000 pound of organic fertilizer[15]

Each of these has great value in our current and coming economy. They can be sold by the algae producer/converter in the local, national, and global market.



Examples of small scale (left) and large scale (right) algae production.

Benefits of This Strategy

- Family and village level production capacity, employment and a living wage.
- Sustainable methods of farming which allow for the saving of seeds, continued improvements to the soil. intercropping and mulching that retain moisture and improve soils.
- An agricultural middle class with small scale organic vegetable farming and algae farming at any scale.
- The creation of infrastructure and infusion of wealth that spurs additional investment and enterprise.
- Significant improvement of soil quality.
- Additional carbon makes arid soil more fertile and water absorptive.
- Carbon removal from the atmosphere reduces global warming as it sequesters it in the soil.
- It is a model that can be replicated in many places around the world.
- The number one requirement for algae culture is land and labor which is in ready supply in these impoverished rural areas.
- Urban impoverished areas can be also impacted with concentrated farming techniques.

Resources Needed

Material Resources

"The Regeneration Kit" including:

1.) Seeds for planting (Corn, beans, squash, flax, hemp)
2.) Agave Tissue Plugs
3.) Fertilizer
4.) Piping for irrigation system
5.) "Water maker" drip system
6.) "How to-" manual in local language
7.) Rake and other necessary tools

Human Resources

College Interns
NGO partners
UNDP and UNEP
Local population who are interested in pursuing this option
Local and national government
Experts in local climatology, weather patterns, soils, and cropping systems
Local schools

- Who is needed for its success?
  - NGO's and the United Nations
  - Aforementioned Human Resources
- What is the role of the NGO's and the UN?

+ Providing political and cultural introduction, connections and conversations, opening "political doors"
+ Health teams and food teams with capacity to carry the strategy from the short term to long term
+ NGO's with:
  - local credibility and presence
  - volunteers
  - transportation into existing projects
  - seed / investment money
  - resources and information about climate, economy,

local crops issues etc.
technical information resources
demographics
research university connections
the ability to be a driving economic force by operating with a more "for profit model"
industry creation capability
partnerships with grant potentials
ability to pull input from local people

Raising Awareness of Phase 3:

- Kick-off meeting, inviting targeted enterprises/donors, leading individuals and press members to listen to ActionAlgae
- Media campaign to be supported with investing enterprise, featuring their logos
- "I Love ActionAlgae" compressed t-shirts to be distributed with seleted magazines, supported with advertorials in the same magazines
- Press tours to ActionAlgae towns in Africa
- Trips to ActionAlgae towns in Africa, as an unforgettable/mind opening travel experience for adventurists

Estimated Phase 3 Costs and Returns Through 2015

Year		Source	Cost	New Use in Acres	# of People Employed
Year 1	2008	Seed Money	$ 200,000	Demo Prototype	0
Year 2	2009	Loan	$ 20,000,000	30 Pilots	150
Year 3	2010	Investment	$ 60,000,000	20,000	100,000
Year 4	2011	Investment	$ 400,000,000	1,800,000	9,000,000
Year 5	2012	Spontaneous	$ 10,000,000,000	8,200,000	41,000,000
Year 6	2013	Spontaneous	$ 20,000,000,000	11,800,000	59,000,000
Year 7	2014	Spontaneous	$ 45,000,000,000	38,200,000	191,000,000
Year 8	2015			39,979,970	199,899,850
			$ 75,480,200,000	100,000,000	500,000,000

PROJECT TIRES ON FOOT

Zeynep Arhon

Strategic Summary: Project Tires on Foot (TOF) suggests a new source of employment and primary income for the poor, especially those in refugee camps, and envisions that every human being on this planet has at least one pair of shoes: The TOF Shoe. The TOF Shoe will be designed by a globally-known designer and produced from scrap tires sourced from a leading tire manufacturer. The TOF shoe will be "manufactured by people on bare feet for themselves and for the rich world" in a branded way, as a source of significant profit. This is about the poor world fighting with poverty with one of the most powerful tool of capitalism: Brand power. This is about getting one step ahead of the current charity paradigm based on rich producing for the poor and donating a portion of generated revenues. Project TOF can also be used as a platform/tool to boost global awareness about UN Millennium Development Goal #1.

Present State of Global Mobility

As with all basic rights; right-to-mobility is distributed unequally around the world.

- In 2002 there were 590 million cars in the world. That is one for every ten people[16]
- In contrast, in the Central African Republic, Bangladesh and Tajikistan there is one car for every 2000+ people
- In the poor regions of the world, millions have no access to even the simplest vehicle. Mobility is on foot, sometimes bare foot
- Virgin Galactic prepares itself to send first civil astronauts into space by 2009. In a decade of space tourism, each and every human being on the planet at least deserves a pair of shoes
- One of the outcomes of high mobility in the developed world is scrap tires
- Today's technology does not allow for re-use of recycled tire rubber in the production of new tires
- Because of speed, safety and other performance requirements of tires, they need to be made mostly using virgin rubber compound
- Millions of tires find their way to landfills every year
- There are 20.8 million refugees in the world[17]

MOST AND FEWEST CARS

Rank	Territory	Value	Rank	Territory	Value
1	New Zealand	61.3	191	Afghanistan	0.16
2	Luxembourg	57.6	192	Chad	0.15
3	Iceland	56.1	193	Nepal	0.10
4	Canada	55.9	194	Ethiopia	0.10
5	Italy	54.2	195	Armenia	0.09
6	Germany	51.6	196	Somalia	0.08
7	Switzerland	50.7	197	Myanmar	0.06
8	Malta	50.5	198	Central African Republic	0.05
9	Austria	49.4	199	Bangladesh	0.05
10	Australia	49.3	200	Tajikistan	0.04

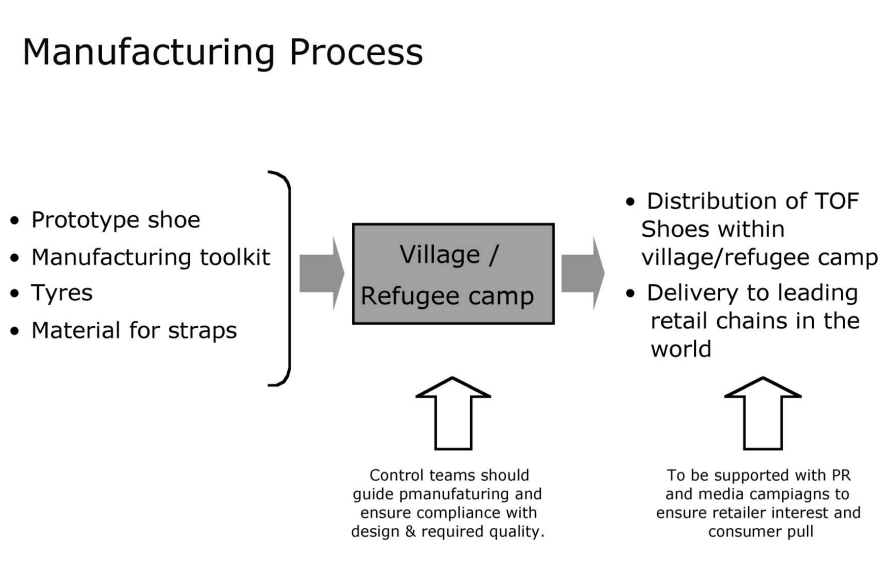
passenger cars per hundred people

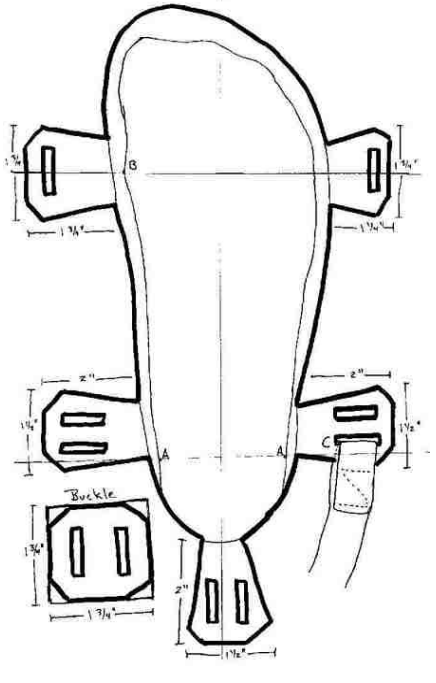
Solution

Project TOF will make durable, functional shoes from scrap tires. This is not a new idea. It is merely an idea whose time has come. In Germany, after the Second World War, scrap tires were used to make shoes. Scrap tires are still being used for this purpose by outdoor enthusiasts because of their durability. If tires can carry cars, they can easily allow people to walk long distances. In addition, it is relatively easy to make shoes out of scrap tires. A detailed description for one such shoe can be found at:

http://www.hollowtop.com/sandals.htm

The TOF Shoe will be made out of 100% used materials. The sole will be made of scrap tires. The straps will be make out of used bag handles, car/aircraft safety belts, or the inner tubing of tires. The TOF Shoe will be manufactured by "people on bare feet, for themselves and for the rich world."





Strategy for Implementation

Strong partnerships are required in order to turn Project TOF into reality.

1. The first partnership will be with a leading tire manufacturer. The manufacturer will source scrap tires as the raw material of the TOF Shoe. It is likely that manufacturers will welcome the project since there is no proper/environmentally-friendly method of getting rid of used tires, which are an environmental hazard in themselves. Partnering manufacturer will be expected to collect back tires from its distributors.

2. The second partnership will be with a world-class designer. The TOF Shoe will be designed by a famous designer, willling to get involved in a cause-related project (i.e. Philippe Starck, Bruce Mau, Ross Lovegrove...etc.). Alternatively, a leading shoe producer (i.e. Nike, Camper, Hush Puppies... etc.) may take over the design process. Partnership with a leading designer/shoe producer will yield an iconic TOF Shoe at minimum cost, and it will maximize the value of The TOF Shoe brand in the eyes of potential consumers.

3. The third partnership needs to be with a strong logistics company. This is to enable the used tires and The TOF Shoe manufacturing toolkits to be shipped to villages/refugee camps that will manufacture the TOF Shoe. The logistics company will also transport manufactured shoes to leading retailers that will

sell the TOF Shoe. Ideally, the logistics company would see Project TOF as a corporate social responsibility initiative and assume all or parts of the delivery cost, until the project was able to cover these costs from the sale of The TOF Shoe.

Half of the TOF Shoes manufactured in the first year will go to the village or refugee camp where the shoes are made. The other half will be sold on the international market in brand name retail outlets. The profits will return to the workers who made the shoes.

The TOF Shoes will be a genuine source of profit for refugees, as they are introduced in leading retail chains in the world (i.e., Ikea, GAP, Sainsbury, stores of the partnering designer/shoe

manufacturer, amazon.com...etc.) Once they are available for mass consumption, the shoes will boost public awareness about poverty and UN Millennium Development Goal #1.

Strengths:

Everyone will win:

- No more bare feet - The TOF Shoe will help the poor travel to water, to school, to jobs, and back home
- The project will create employment and income opportunities in villages and refugee camps where there is currently little or no economic activity
- The TOF Shoe, if branded effectively, will be a global status symbol among both the weathly and the poor
- Partnering companies will enjoy high corporate social responsibility (CSR) rating and PR value (Tire producer, designer/shoe manufacturer, logistics company)
- Retailer chains that carry the TOF Shoe will build image and profit
- The environment will win because fewer tires will go to landfills

Project TOF has the potential to attract possible media partners (i.e., TV stations, print media...etc) and minimize announcement costs for demand creation. There is also potential for celebrity endorsement (i.e., actors, musicians, politicians, etc. turning into ambassadors of The TOF Shoe by actually wearing them).In time, the project may pave the way for alternative uses of tires in the fight against poverty. For example, tires can be used to build durable housing, refugee camps, social centers, schools, and playgrounds for children.

Finally, the massive outreach and sales of TOF Shoe will boost awareness about UN Millennium Development Goal #1. Each individual who hears about or buys the TOF Shoe will gain at least some notion of the scale of poverty in the world.

Weaknesses/Challenges:

Project TOF does not change the fact that tires are environmentally hazardous. It does convert tires into a different material that is friendly with the planet and useful to people without shoes. Even with Project TOF, the world will still have to deal with scrap tires at some point – even if they are in the form of shoe soles.

Once the TOF Shoe gains a certain level of awareness, it is expected to generate significant profit for the villages/refugee camps. However, in order to generate that awareness, media and PR investment is required. UN support may be a way to overcome this challenge. United Nations High Commissioner for Refugees (UNHCR) may be a potential source of necessary funds. UNHCR raises funds through governments, foundations and private donors so that refugees can be assisted immediately with food, shelter and other essentials distributed by the agency's implementing NGO partners. There are 20.8 million refugees in the world and Project TOF may change the lives of some if not all.

Another challenge is to make sure tires are handles properly in villages / refugee camps. If not handled correctly, scrap tires make excellent breeding grounds for mosquitoes. A single tire can be the source of thousands of mosquitoes over the course of a summer and raise the risk of malaria.

Examples of shoes made from scrap tires.

EDUCATION FOR EVERYONE

Andy Cavatorta, Anne Loyer, Annika Semmler, Elke Esmeralda Dikoume, Natasha Cline-Thomas, Rafi Pelles, Theodora Filip, Rachel Wong

Strategic Summary: The Education for Everyone group developed a strategy that employs education and community-involvement in school construction, operation, and maintenance to address poverty from the ground up, providing opportunities for children and future generations. One of the largest barriers to school attendance for children in less developed areas of the world is the distance they must travel to get to a classroom. This plan has local communities construct their own schools, built with local materials and powered by small-scale wind and solar technologies.

Present State of the Global Education System

• Over 100 million children in the world do not have access to education.[18] This silent emergency has a real and immediate effect on the capacity of countries to make inroads into poverty and on citizens' ability to realize their rights. Education, especially of women and girls, is the single most powerful weapon in the fight against poverty.

- Adult Literacy Rate - Sub-Saharan Africa (SSA): 62%; World: 78%
- Adult Literacy Parity (females as percentage of males) - SSA: 76%; World 86%[19]
- Orphans and vulnerable children - estimates vary but there are approximately 13 million orphans, with the majority of them living in SSA
- Disabled children - World Bank recently estimated that nearly 40 million of 115 million out of school children are disabled.[20]
- Children in rural, hard to reach areas (including pastoralist communities) constitute most of the out of school children.
- Costs of schooling - the lack of enrollments in primary education is often attributed to the cost of schooling, both direct and indirect costs, or opportunity costs. Direct costs include: school fees, uniforms, school supplies, transportation and food. Indirect costs include: child labor, distance to school
- School fees - as a direct or indirect cost - are an impediment, particularly for girls and other disadvantaged children, from enrolling and regularly attending school
- Cultural or family perceptions about the value of basic education vary

Preferred State of the Global Education System

Everyone in the world has:

- culturallly appropriate education
- the knowledge they need for their communities to thrive based on their own standards
- communities are as self-sufficient as possible
- people are healthy and have access to healthcare
- the society the community is a part of has a sytem of justice and individuals are aware of their rights
- people are able to participate in the world beyond their immediate communities - regionally, nationally, and internationally
- all female children have an education
- all members of the community have better business opportunities, resulting in a universal living wage
- there is gender equality in earnings, job opportunities, and inheritance, property, and other rights

Everyone in the world has access to education about the following:

SELF-SUFFICIENCY: Shelter, Sanitation, Technological Self-sufficiency, Solving local problems, Health Practices, Resource Self-sufficiency/knowledge, Connected/Access to information, Creation of a better sustainable world, Effective local medicine
JUSTICE: Human Rights Awareness, Empowerment/Equality for women, Local laws awareness
HEALTH: Family Planning, Disease, Sanitation, Health Practices, Effective local medicine
BASIC EDUCATION: Reading, math, health, history, global awareness, money management

"*Only a person who is aware that he or she has rights can better strive for those rights, whether it be the right to a job, to obtain adequate food, shelter or medical care, to participate actively in political life, or to benefit from the progress of science and technology*" - UNESCO Director-General Koïchiro Matsuura

Strategy

This plan of educational development addresses all of the Millennium Development Goals by providing the education needed to allow individuals to move out of poverty, to meet their basic food, health and sanitation needs, and to build sustainable environments from which they can share their intellectual, cultural, and material resources with the global community.

This plan develops an educational system made of self-sustaining, self-replicating schools; an online knowledge network; and a project-based, adaptive curriculum.

At the center of this plan is a self-sustaining demonstration school in each region. This school will feature:

• Energy self-sufficiency. The school will generate energy to meet it's electricity needs. This will be produced from local renewable energy sources or imported photovoltaic cells. Energy generation will be demonstrated in classes for adults and children. This will encourage the community to develop similar methods for meeting their individual energy needs.

• Increased food self-reliance. The school will generate food to support a school lunch program. A demonstration farm will be an integral part of each demonstration school. One of its goals will be to allow adults and children to develop new methods of food production suited to their region. The farm's output will feed the students.

• A demonstration metal and woodworking workshop will allow students and their families to learn and share different skills. It will come with construction plans and blueprints for the creation of tools necessary for food production and the building and maintainance of power generation equipment such as simple windmills. The workshop will also be able to be used for the building and maintainance of tools for building construction. This knowledge and set of tools can then be used on outside projects in the community, and to create the tools necessary to build future schools.

• The school building itself will be a demonstration in building methods suited to the local region, where passive heating and cooling are designed into the building. The design of the building will reference local architecture - so that it takes advantage of any techniques that may have been developed for that climate, and fits into the cultural and physical landscape. As the school grows, each addition can be the basis for a class project.

• The school will be connected to the Internet. Through a satellite link to the Internet, and a local network of $100 laptops, the students and teachers will have access to outside expertise on all projects they decide to undertake. All the farming and community building experience from the Millenium Villages Project and similar efforts can be fed into the system, as well as access to regional agricultural exchanges.

Replication

Our model school can accommodate up to 500 students. It would be staffed by 10 teachers and 10 teachers-in-training. The schools would incorporate working examples of ideas and techniques that benefit the whole village. Each school will contain many resources and services that add wealth to the village in the short and long term.

The intention is that each school would be replicable. Groups of 10 teachers train alongside established teachers for one year and then move on to start schools of their own. Each school would produce a new batch of trained teachers every year. Since each school has a fabrication shop of tools that can be used to work with wood, metal, and other raw and recycled materials, that the shop and all its tools can be used to create the core of a new shop. Teachers will also be trained to direct the construction of their own school.

Network

A web-based educational network will connect all schools and contains educational materialsn that can be downloaded and used in the schools. The network will be designed to enable and foster a participatory sharing and creation of culture and knowledge. The content of the Education for Everyone educational network would be open-source, much like a wiki. Its users (teachers, students, villagers, administrators) are expected to be contributors, so they are invested in the process. This will help the content to adapt, evolve, and grow. It will also help to ensure that it's relevant to its users.

Phase I: Planning (Months 0 – 6)

1. Initial Staff:
   + Program Director
   + 10 teachers
   + 10 teachers-in-training
   + Educational Consultant
   + Systems Administrator/Data Analyst
   + School Construction Manager/Engineer
   + Architect (sustainable, vernacular architecture)
2. Set up teacher training program
3. Locate 10 schools in 10 different regions or climates (as in the Millennium Village Project model)
4. Purchase/obtain land in each community for school location
5. Community Meetings
   + School Design and Curriculum
   + Parent-teacher meetings
   + Youth Advisory Committee meetings
   + Plan incentives for girls
6. Design school lunch program
7. School design (vernacular, appropriate architecture) and review
8. Design farming plan
9. Set up Internet connection plan and service

Phase 2: Construction (Months 7 – 12)

- Gather/Create building materials from local sources
- School Construction using local materials, with energy supplies, water collection, water storage and sanitation
- Demonstration Farm planting
- Set up shops for basic wood and metal fabrication
- Build two windmills (one for electricity for computers, and one for water pump)
- Build water pump for irrigation and sanitation
- Weekly community meetings to review progress.
- Purchase computer equipment for first ten schools (10 computers)
- Set up satellite or other appropriate devices for Internet connection
- Set up teacher training and professional development
- All teachers report back daily on their progress via a web page
- provide contributing information from teachers, villagers, students (through teacher until 1 lap top per child reached)

Phase 3: School Start Up (Months 13-18)

- Demonstration Farm – agriculture class
- Demonstration windmill – design and build windmill
- Demonstration Sanitation – design and build water system
- Demonstration Fabrication (tool shop) – build capacity for future projects.
- Curricular adaptation to student needs; in consultation with student Advisory Committee.
- Next round of teachers-in-training hired
- Data collection for reporting return on investment (students impacted, quality of life issues affected, skills acquired)
- Grow network by adding students using $100 laptop

Phase 4: School Replication (Year 2)

Repeat of phase 2 & 3 with teachers-in-training now acting as teachers, with a new batch of teachers-in-training acting as assistants

COSTS				
		ongoing	start up next 10 - per school	ongoing - next 10
start up costs				
teachers (10 per school)	10000	5000	10000	5000
staff (3)	3000	1000	1000	
seed & fertilizer	300	100	300	100
tools	500	50	200	50
computer	300		300	
internet connectivity	1450	1200/yr connection	200	
computer	300	50	300	50
lunches ($37/kid/year - 500 kids)	1850	925	1850	925
windmill	100		100	
1 laptop per child		685000		6850000
	17800	692125	14250	6856125
for 10 years		6921250		68561250
Total	75514550			
TOTAL	75,514,550			

Costs associated with the program.

Program Direction
Director - Set up community meetings
- Arrange teacher training and continued proffesional development
- teacher exchange program
System Admin - to maintain and monitor network, solve tech problems
- Generate and find content (work with UNESCO)
- facilitate connections with outside experts/ consultants

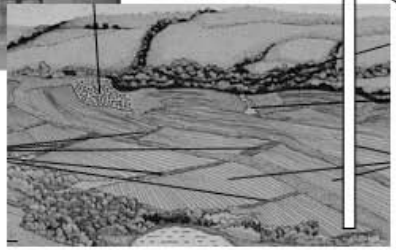
PEOPLE
Community Meetings for school planning
Men and Women participate
Parent - teacher meetings
Youth Advisory Program
Incentives for girls

NETWORK
Year 1: One lap top computer per school
Year 5: One laptop per child
Internet connectivity
- Villagers, students.teacher contribute information back into the system
- Curriculum, school system, knowledge all evolve to adapt to changing needs, improved understanding of the process
- Directors, outsiders, donors, agricultural exchange, other teachers, etc. can all exchange, consult, contribute
- Access to WWWeb for curricular resources, Kinkajou lesson plans
- All crucial changes to system are updated at night so system works offline

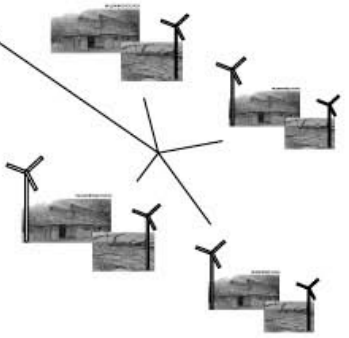
MILLENIUM SEED SCHOOL

Vernacular Architecture - heating and cooling design suited to climate

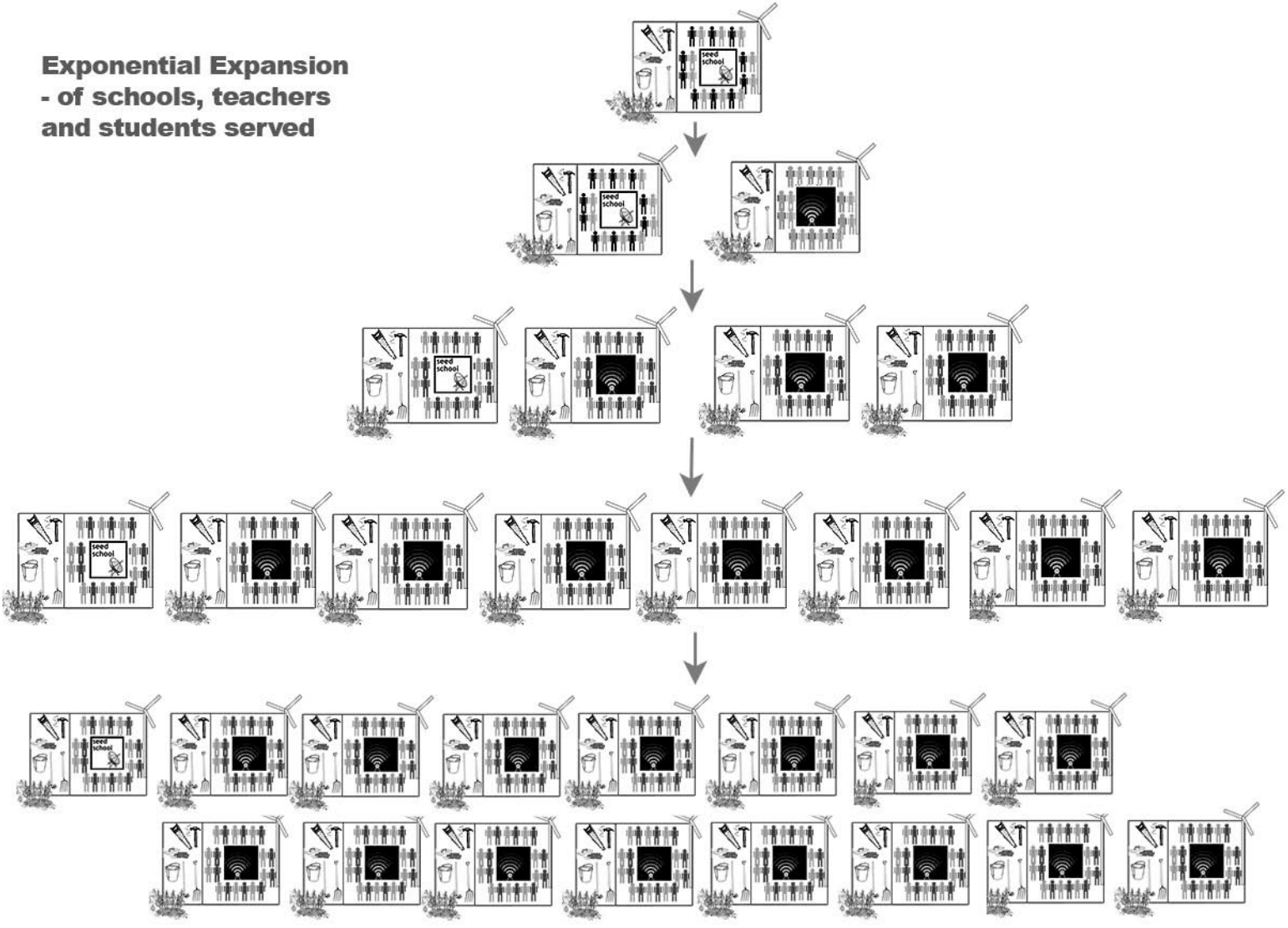
Facilities equipped for:
Health education
Nutrition (cooking)
Scientific Method (basic experiments)
Democratic process
Culture/traditional practices
Distribution (sanitary napkins)
Child care for adult ed classes
Kinkajou for adult ed

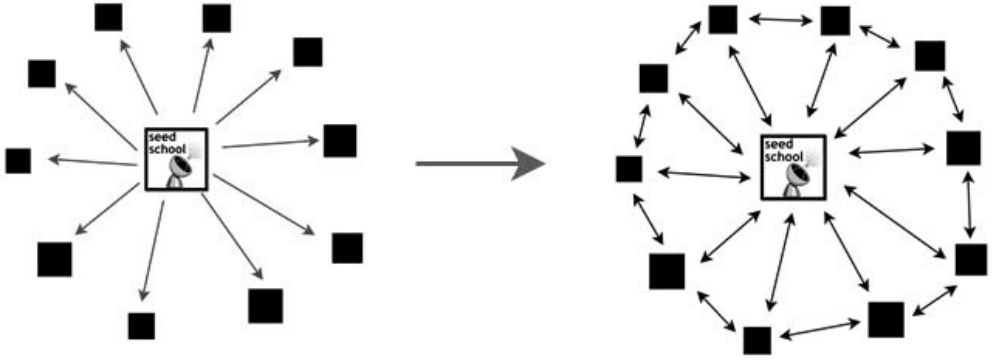


Demonstration Farm (school lunches)
Demonstration Water Collection and Sanitation
Demonstration Energy (windmill)
Demonstration Building Construction
Demonstration Fabrication (tool shop)

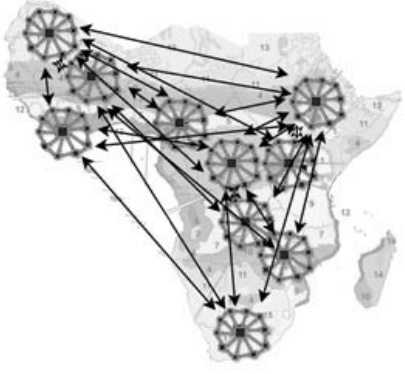


Exponential Expansion
- of schools, teachers and students served





Initially information would flow from seed school to next generation schools. Soon all schools would be contributing to the network. Information sharing will grow regionally, across all of Africa, and with the global community.



NGOs: MILLENNIUM DEVELOPMENT GOAL REALIZATION

Samah Hanaysha, Veronica Peña, Razi Shawahdeh

Strategic Summary: The NGO MDG Realization group propose a new way of structuring and employing non-governmental organizations (NGOs). The strategy seeks to bring NGOs more in line with what is needed on the ground and to move them away from donor interests and influence to better serve individuals and communities.

Present State of the Global Civil Society

- 15% of development aid is channeled through NGOs
- 6,000 – 30,000 national NGO in developing countries
- 40,000 Internationally operating NGOs
- The United States has an estimated 2 million NGOs, most of them formed in the past 30 years
- India is estimated to have between 1 and 2 million NGOs
- In Kenya alone, some 240 NGOs come into existence every year

Some general problems with NGOs:

- Many NGOs operating but problems they seek to address continue to persist
- Too many one-shot efforts
- Competition: NGOs' efforts often conflict with each other
- Donor agendas often do not match recipients' real needs
- Often insufficient and unreliable funding
- Misuse of funds by some NGOs
- Lack of proper controls often leads to divergent and unintended results
- Unskilled and untrained staff often diminish value

Case Study: NGOs and Poverty in Palestine

- The Palestinian Central Bureau of Statistics (2007) lists 1,664 registered NGOs in the West Bank and 1,061 registered NGOs in the Gaza Strip[21]
- Total of 2,725 NGOs serving a population of approximately 4.3 million (PCBS, 2007). 1,578 people per NGO
- According to UNESCO, a full 50% of NGOs in the West Bank are small (1-5 employees) and 35% of Gaza Strip NGOs are small.[22]
- Palestinian gross domestic product dropped by 6.6 percent in 2006[23]
- Poverty figures rose by 30 percent over the previous year, for an actual 75% of people living under 2$ a day
- Unemployment was over 30 percent
- Those who would be unable to feed themselves without aid reached 49 percent of Gaza's population

Preferred State of Global Civil Society

Effective NGOs:

- Work transparently
- Have sustainable, self-perpetuating funding
- Train local people as staff
- Collaborate with communities they serve
- Network together to coordinate efforts
- Involve local businesses and governments as partners
- Promote self-reliance
- Meet needs and empower people(economically, educationally, culturally)
- Are autonomous and legitimate
- Have government endorsement of their activities
- Have aims that the people they serve accept
- Have their agenda directly influenced by the people they serve
- Are accountable for the results they do or do not achieve

Other Considerations of Effective NGOs:

Effective NGOs have a clear understanding of existing NGO strategies and programs. They make a needs assessment of their constituents, see how many NGOs are needed, and what kind of enterprises and products are requirede to meet these needs. Effective NGOs in rural settings often focus on agricultural programs first. They train people to increase productivity, often provide micro-loans, and promote "green business." Effective NGOs have clearly stated goals on new enterprises and income generation. A national body that collects and monitors grants would be an effective procedure in many parts of the world, including Palestine.

Strategy

1. NGO in a Box kit – This kit would contain materials that would enable an NGO to be more effective. The kit would contain information on strategy consultancy, project management, accounting, human resources, fundraising, values and goals clarification, communication tools, agriculture training, etc.
2. Micro Venture Capital and Local Incentive Programs and Media Campaign "Kit."

• NGO in a Box Kit:

- Produce the Kit and distribute it to all NGOs working with Micro Business

The purpose of this kit is to provide NGOs with a "crash course" in the tools, skills, and strategies they can employ to be as effective as possible. This kit will help NGOs with a variety of functions such as basic office management (accounting, human resources, etc.) all the way through fundraising campaigns and program creation and execution. Providing NGOs with these basic tools will help free their creative energies and allow them to focus on aiding the communities they work in.

• Micro Venture – Capital

- Start with 500$ - 1000$ projects
- Local incentive programs for agriculture initiatives

- Subsidies, fairs, conventions, farmers' markets
- For example, in Palestine, NGOs can work as intermediaries between the occupation authority and farmers
- Help farmers to access international markets
- Consolidating Farmers into cooperatives
- NGOs working as hubs to sell and buy bigger quantities.

• Media Campaign

• Web, Radio and TV presence.
- NGOs that promote income generation through micro-business
- The staff will be local trained people, providing jobs and income to communities in need and allowing people to be actively engaged in helping themselves, their neighbors, and their country.
- Micro-Businesses: commercial, manufacturing, specially value added agriculture
- Regular meetings with key people, leaders of the community and donors, congresses.
- Regular evaluations of how NGOs meet the peoples' needs
- Frequent communication: radio, TV, newspapers
- % of government budget to NGOs
- The money to start/continue will come from the international community
- Results-based accountability according to a National Plan
- Capacity building alternatives: in-site, online, etc

Images of Palestinian communities in need. Communities like this would be the targets for aid from NGOs.

object	quantity	estimated cost	sub total
material needs			
computers	7	100	700
projector	1	2,000	2,000
printer	1	1,000	1,000
office furniture		5,000	5,000
camera	1	800	800
Investment			**9,500**
rent an office	1	1,000	12,000
printing materials		1,500	1,500
manager	1	1,500	18,000
secretary	1	900	10,800
acountant	1	1,100	12,200
Media officer	1	1,000	12,000
lawyer	1	1,300	15,600
experts trainers	4	1300*4=5200	62,400
media campain expenses	12	2,000	12,000
Operation			**156,500**
loans for farmers			**100,000**
			266,000

Cost break-down of the NGO in a box and Micro Venture-Capital strategies.

UNITED NATIONS EMPOWERED

Ross Cameron, Dale Castle, Eric Goldfischer, Joshua Kauffman, Shivani Mathur, Ethan Rosch, Hyoung Suk Seo, Ani Shahinyan

Strategic Summary: The UN Empowerment group points out that most of the nations that have signed on to the UN Millennium Declaration – and thereby agreeing to pledge 0.7% of their GDP as development assistance – have not fulfilled their pledge. The group decided to take up this issue and create both incentives for nations to fulfill their pledges and accountability measures for nations that don't. In this plan, only those nations that make good on their pledge of 0.7% GDP to the United Nations will be allowed to bid on development projects – therefore allowing them the opportunity to see an income return on their development assistance investment. The strategy will be aided by the use of advanced project management software currently in use by the U.S. government to track funding vs. results.

Present State of Global Development Assistance

- Governments have committed to .7% of their Gross Domestic Product (GDP) to Official Development Assistance (ODA) to fund the UN Millennium Development Goals (MDG) but are not fulfilling these pledges[24]
- Governments are not held accountable for their MDG funding commitments
- There are no effective tool(s) for accountability
- MDG development funding is currently allocated by member states and not the UN
- There is not enough transparency as to who paid what, for what, and when
- There is not effective or efficient overall organization of the money that goes into MDG programs, nor is there a link between monetary input and project management and evaluation
- There is a lack of awareness of and responsibility for the MDGs in some countries

The UN Empowerment group identified four overarching reasons why the MDGs are not being achieved, or being achieved more slowly than needed.

1.Poor governance - marked by corruption, short-sighted economic policy choices, and denial of human rights.

2.Poverty traps - where local and national economies are too poor to make needed investments.

3.Compartmental progress - where progress is made in one part of the country but not in others, leaving sizable persistant pockets of poverty. Even when overall governance is adequate,

there are often areas of specific policy neglect that can have a monumental effect on their citizens' well-being.
4.All of the above - where all these factors occur together, making individual problems all the more challenging to resolve.

Preferred State of Global Development Assistance

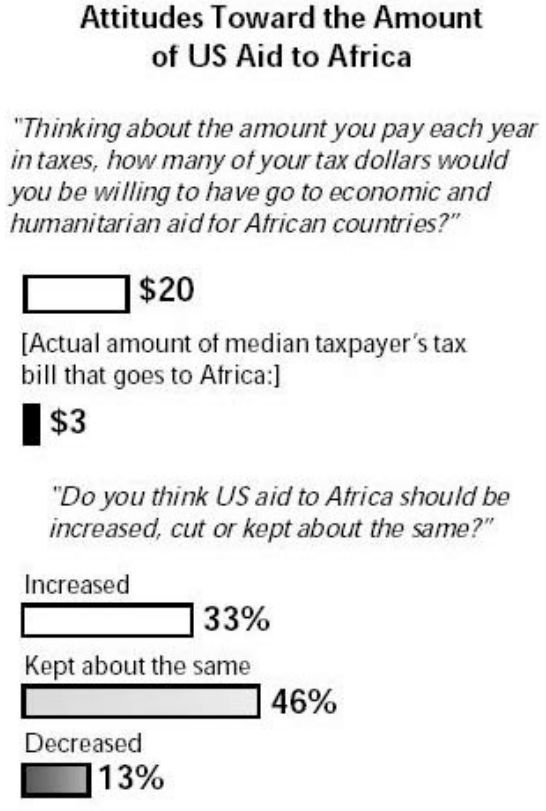
By 2015:

- There is adequate funding to exceed all Millennium Development Goals
- Monies are collected and distributed unconditionally, without political inhibitions/agendas
- All governments will meet the MDG funding of 0.7% or greater of GDP for ODA
- MDG development funding will be monitored solely by the UN.
- Transparency = Everyone can see what everybody is doing directly with MDGs

This is the gap between where we are and where we want to be:

0.37% gap in average country fulfillment
$106 billion cash on hand
$119 billion of cash missing

= 0.53 % cash gap[25]



The chart above shows that people in the U.S. are willing to give more money for global development aid, particularly to Africa.

Strategies

1. ODA Return on Investment (ROI) Motivation Initiative

This strategy, the Official Development Assistance Return on Investment Motivation Initiative focuses on providing the UN Development Programme (UNDP) with a sophisticated set of software tools to allow them to manage individual MDG projects, issue requests for proposals (RFPs), and track successes or problems at the project level. These tools would increase the effectiveness of the MDG project and provide donor countries with a window into how their money is being spent and how effectively it is being used.

An important aspect of this strategy is the incentive structure to encourage countries to give the full 0.7% GDP they have pledged. Incentives include:

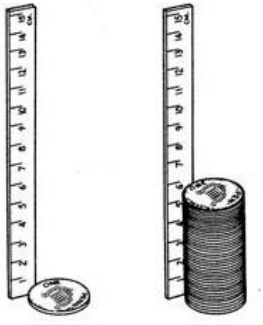
- Transparent management: UNDP prioritizes and manages all MDG projects through the MDG fund
- Request for proposals: The UNDP issues RFPs for needed projects
- RFP eligibility: Only governments who have fulfilled their 0.7% commitments are eligible to bid on the RFPs.
- Preferred RFP bid weighting system: to foster increased contributions
- The winning government RFP bid gets the right to the contract and recoup some of the money they have put into the fund
- Utilizing their own military industrial machine and/or subcontractors, the MDG Fund money flows back into the economic system of the donor country
- Transparency throughout entire process

Existing resources the strategy will use:

- UNDP resources such as project management skills and staff, MDG development fund

Resources needed for the strategy:

- one additional project management director
- two additional project staff
- one additional MDG UN public communications liaison
- project management software



2. Lifeline Awareness Initiative

This strategy, the *LIifeline Awareness Initiative*, focuses on the development and use of a series of informational tools that increase the awareness and transparency of the use of all MDG funding. These tools include the MDG Index and teh Lifeometer.

One part of the awareness campaign involves raising or lowering the level of countries' flags in front of the U.N. Headquarters based on how much of their aid pledge they have fulfilled.

These tools will:

• Increase worldwide media awareness of the funding of the MDGs and which countries have met their MDG funding pledges. The MDG Index and Lifeometer will be prominently displayed on such publicly viewable sites as Google.com, all UN agency websites, and financial pages of newspapers throughout the world.

• The Index and Lifeometer will also be used by existing MDG campaign advocacy groups such as: One.org, Red Campaign, etc.

• The Index and Lifeometer will also be displayed on a large digital billboard outside the UN Headquarters. This display will also feature information showing how close we are to the MDG funding goals with a web address for further information.

Other graphic displays of MDG funding pledges will include:

Coin Stacks

• This graphic will illustrate how little is being asked of a citizen of a country. It will show two stacks of coins - one representing the GNP of a given country, the second showing what 0.7% looks like.

UNTV: In-Sight, In Mind

• This graphic display will be featured on "UNTV" - a new cooperative venture with major television systems throughout the world. Content will be based on MDG successes and needs.

UN Flag Flying

• This graphic display will involve the use of the country flags that fly in front of the UN Headquarters in New York City. The flags will be raised or lowered based on how much of their aid pledge they have fulfilled. If a country has fulfilled their MDG pledge, their flag will be at the top of the flag pole. If, for example, a country has fulfilled half of their pledge, the flag would fly at half mast.

Anticipated Impacts of These Strategies

ODA ROI-Motivational Initiative:

• Accountability for auditable funds usage and associated governance.
• Increased MDG funding transparency
• Increased project management capability for UNDP as all MDG initiatives are coordinated through one software management system that has measureable goals, deadlines, and penalties built-in.

Lifeline Awareness Initiative:

• Global media exposure.
• Enhanced awareness at citizen level.
• Public pressures to achieve MDGs.

Short-Term Implementation Plan

ODA ROI-Motivation Initiative

• Create ODA trust fund managed by UNDP
• Outline duties of enhanced UNDP staffing
• Define qualifications of development projects
• Define qualifications to bid for projects
• Set up system, issue and award bids, monitor progress and results, report results to public.

Lifeline Awareness Initiative

• Organize and consolidate data collection
• Network with media for awareness campaign
• Design and implement campaign

Long Term Goals

• Development “task forces” managed by UNDP
• Infrastructure development process begins
• Global awareness and civil society accessibility 100%

Metrics for Success

ODA ROI-Motivation Initiative

• Initial increase in direct MDG funding
• Decrease in fulfillment gap
• Increase in project management accountability and visibility

Lifeline Awareness Initiative

• Global increase in MDG awareness across all sectors
• Increased citizen to government contact on MDGs
• Increase in individual donations to MDG Fund (governments, corporations, citizens)

What is needed to set this plan in motion and make it real?

• Prototype the ODA ROI-Motivation Initiative:
• Pilot a Performance Management Database (using current off-the-shelf software)
• Test run Request-Life-Cycle
• Create awareness campaign in the lobby of the UN Headquarters (i.e. Coin Stacks) and measure public response with on-site poll.

What Can the U.N. Do?

For the ODA ROI-Motivation Initiative
• UNDP's DEVINFO sponsors and prototypes a Performance Management software tool that incporates the features outlined above.

SUMMARY/CONCLUSION

The strategies described in this report outline a series of policies, programs, and action plans that, if implemented, would help meet various Millennium Development Goals of the United Nations as well as move the world, in the years beyond 2015, to even higher levels of human well-being. Taken individually, each strategy can stand alone in making a significant contribution to improving some aspect of the human condition. Taken collectively, the strategies are more than the sum of their parts. They would, if implemented together, have a profound impact on our collective wealth, health, and potential.

The global and local strategies described help illustrate the creativity, values, vision, and commitment of the youth and concerned citizens of the world. They also represent what an interdisciplinary, multigenerational group of non-experts can do when provided an opportunity and methodology for tackling the critical and complex problems facing the world. Your feedback is most welcome—as is your ongoing participation in this evolving work. One way to do this is to visit the Design Science wiki (where the first drafts of much of the work in this report was developed). This can be found at http://www.dsl.bigpicturesmallworld.com

As indicated at the beginning of this document, this publication deals with the third year of the Design Science Lab. Those wishing to take part in coming Labs are urged to contact BigPictureSmallWorld at: www.bigpicturesmallworld.com the Buckminster Fuller Institute at www.bfi.org, or check in at www.designsciencelab.org.

Thank you to everyone who participated in the 2007 Design Science Lab!

Design Science Lab 2007

Zeynep Arhon, Aruna Arjunan, Brett Boye, Ross Cameron, Dale Castle, Natasha Cline-Thomas, Andy Cavatorta, Gonzague de Raulin, Elke Dikoume, Daniel Eida, Kyle Fedus, Dustin Feider, Theodora Filip, Angela Fuller, Eric Goldfischer, Iman Griffin, Briana Graves, Samah Hanaysha, Mael Jaffres, Brent Jones, Joshua Kauffman, Michael Khayyat, Karen Lau, Anne Loyer, Kevin Machoka, Lucas McConnell, Shivani Mathur, Susan Moore, Glenn Oehms, Thomas Pang, Rafael Pelles, Veronica Peña, Thomas Pang, Ben Pullman, Lexi Quint, Alexander Reiner, Zoe Richards, Alexandra Rinomato, Ethan Rosch, Annika Semmler, Hyoung Suk Seo, Ani Ahahinyan, Ivan Serezhin, Razi Shawahdeh, Don Whilsmith, Pollan Wong, Rachel Wong

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