Designing With Sustainable Considerations:

Technology as if People Matter

Dr. Robert Wicklein
University of Georgia

What do we know about Engineering Design?

1. Identify a Need
2. Define the Problem
3. Benchmark the Data / Review the Literature
4. Identify the Design Constraints
5. Brainstorm the Possibilities

- Are there other design criteria?

- The Miniature EARTH

What other design strategies would we need to employ if we lived as one of the 72 people that struggled to exist on $2.00 or less per day?

- That's 72/100 or 72% of the Earth's population.

What is Appropriate Technology?

Appropriate Technology attempts to aid and support the human ability to understand, operate, and sustain technological systems to the benefit of humans while seeking to be in harmony with the culture and the environment.

A central concept of AT is that technology must match both the user and the need in complexity and scale.

Quality of life for all humans in the future must be found by people of the industrialized and developing worlds working together to utilize all of their resources in the most effective and efficient ways possible.

This will absolutely require the inclusion of the most abundant and powerful resource available:

Human Beings

Appropriate Technology Design Criteria

- Individual Technology vs. Collective Technology – how is the society structured (e.g., individuals/small families or tribal/community groups)?
  - The technology should be designed to fit within the culture not require the culture to adapt to the technology.

Appropriate Technology Design Criteria

- Systems Independence – can the technology stand-alone without supporting technology or facilities?
- Image of Modernity – is the technology perceived as being modern or progressive within the context of the society?

Appropriate Technology Design Criteria

- Cost of Technology – is the technology beyond the cost of the end-users? Cost must be low to fit within a very low budget.

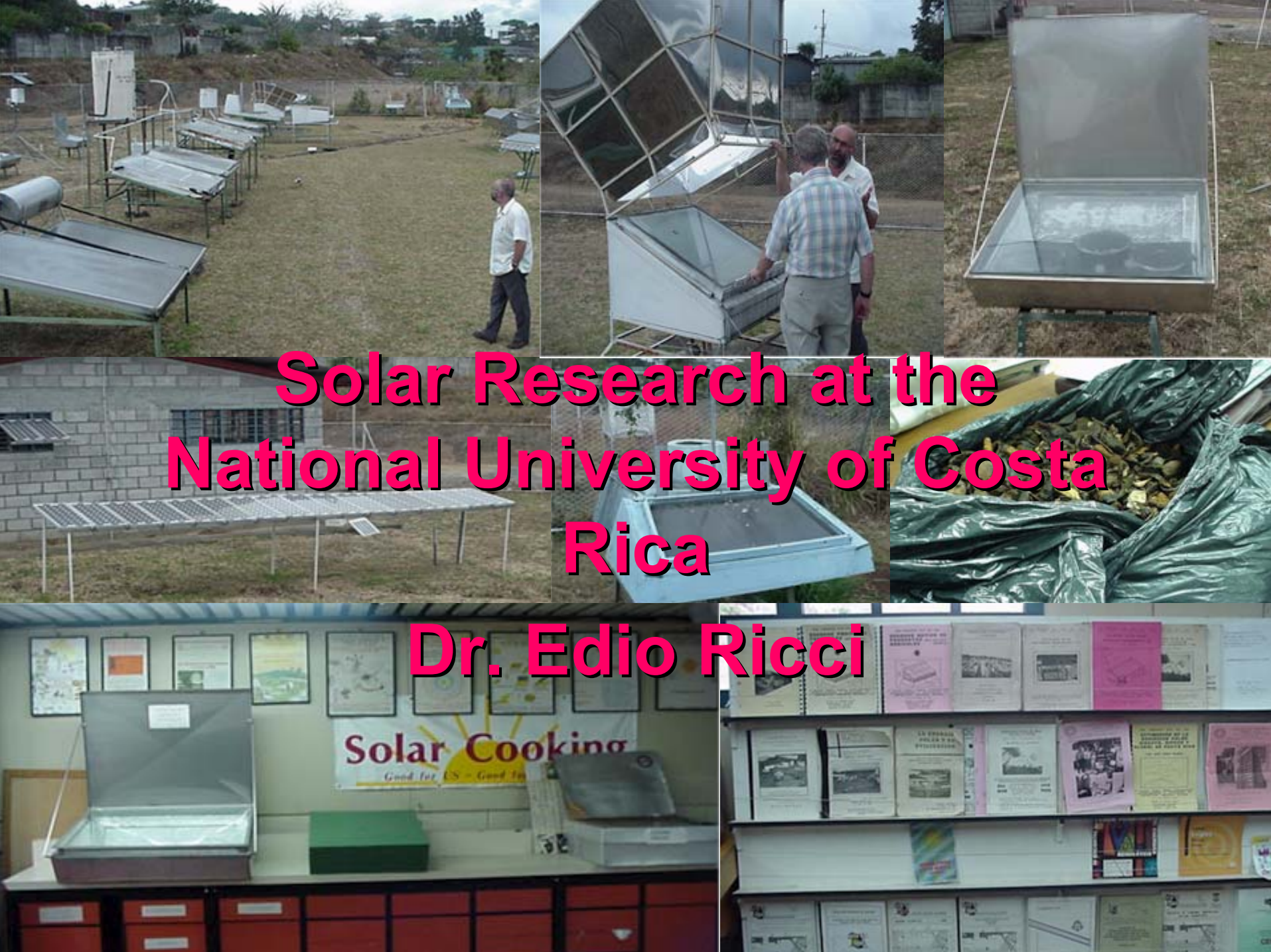
- Risk Factor – what are the internal and external risks associated with the potential failure of the technology? Internal risks are associated with threats to the technology by the actual users of the technology (e.g., can the end-users use and sustain the technology easily). External risks are associated to threats that are outside of the end-users sphere of influence (e.g., natural conditions, governmental regulations).

Appropriate Technology Design Criteria

- Evolutionary Capacity of the Technology – can the design of the technology adapt and grow with the conditions (e.g., Can the hand water pump be converted to an electrical driven water pump when power is available or demand is increased?)

- Single-Purpose and Multi-Purpose Technology – can the technology do more than one job? When possible design the technology to be multi-tasking so that the end-user get the biggest positive impact from the technology (e.g., tiller that can be converted to a water pump).

What do Appropriate Technology Designs look like?



Solar Research at the National University of Costa Rica

Dr. Edio Ricci

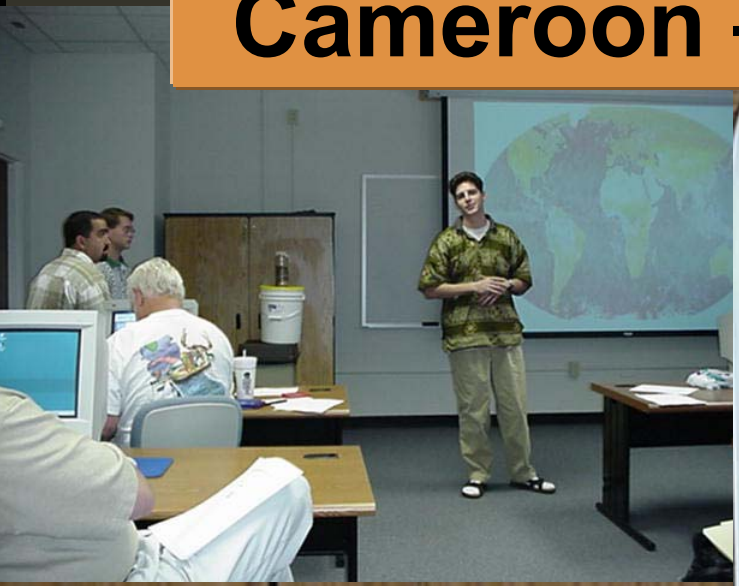

Earth University
Sustainable Agriculture

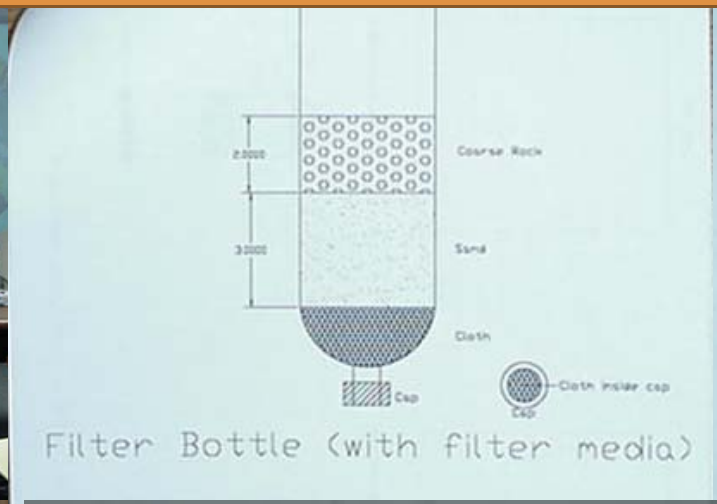

Research in Bamboo Home Construction
Mr. Alejandro Ugarte

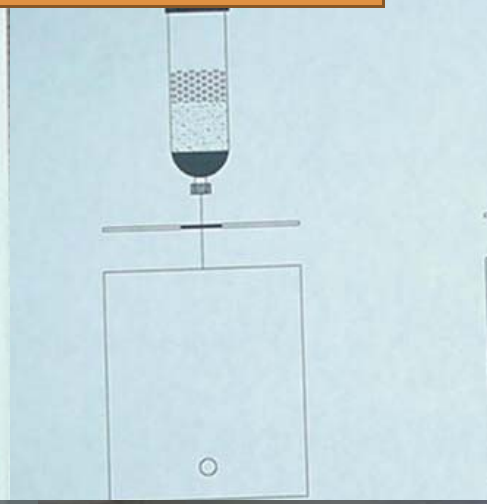

Finca Tinamaste - San Isidro
Mr. Jakob Hediger

UGA Designed AT Devices

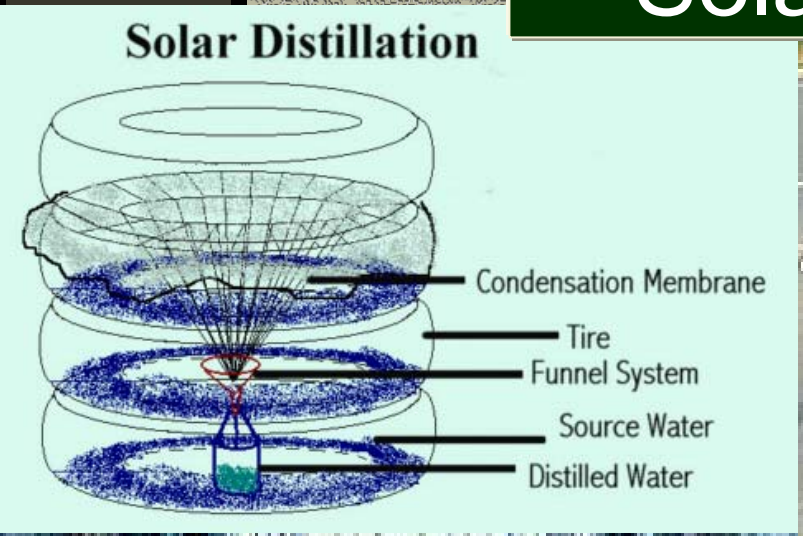
Cameroon – Portable Water Filter

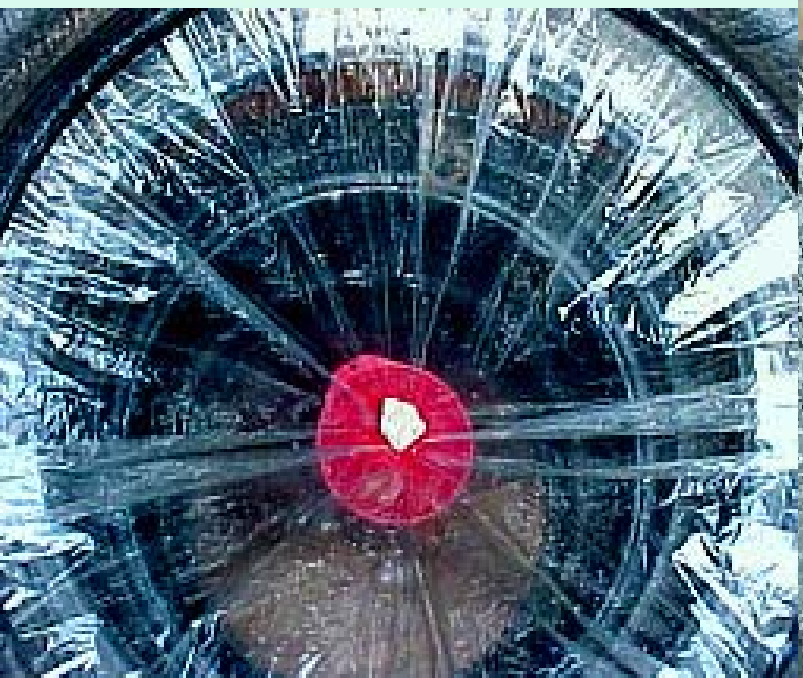






Haiti – Tire Still
Solar Water Distiller





India – Methane Digester

Do these social design criteria have a place with the technical design criteria when solving a technological problem?

Questions???