

Using Science to Help the Extremely Poor

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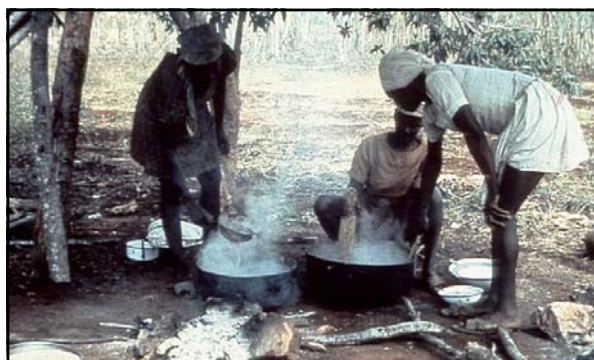
ASA July 2013



What would I be praying about if I were in this family's shoes?



Might I be part of God answering their prayers?



What would science for the poor look like?

ECHO's Vision Statement

To bring glory to God and a blessing to mankind by using science and technology to help the poor.

The Poor Have Few Options



AGRICULTURAL OPTIONS FOR THE POOR



A HANDBOOK FOR THOSE WHO SERVE THEM

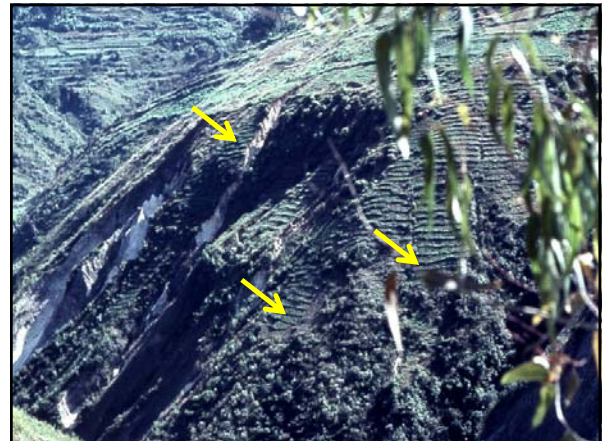
Rural development workers tend to work where urgent human, environmental and spiritual needs converge.

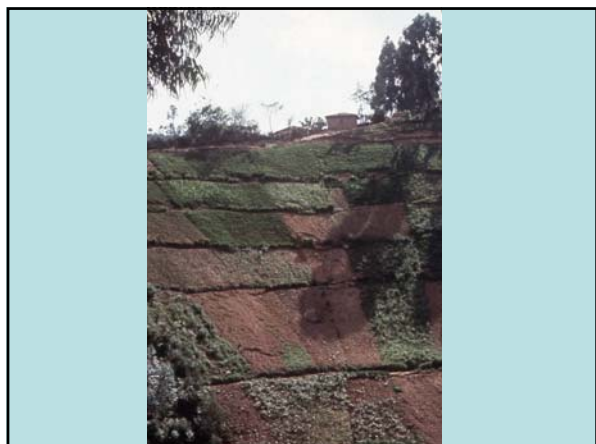
- Environmental scientists wishing to work as a missionary may best find a home as an agriculturalist.

If you can't get a job, where can you go to grow food for your family?



Exuma Island, Bahamas





Problem

- Malaria affects nearly everyone
- Drugs are hard to afford
- Fake drugs are often sold

Artemisia to Heal Malaria



Problem

“I’m going to be translating the Bible in a remote rainforest in SE Asia.
“They tell me you can’t grow vegetables in a rainforest.
“How can I keep even my own family in good health?”

Intern Rachel Parsons examines tropical yams in Rainforest section, ECHO's Global Farm

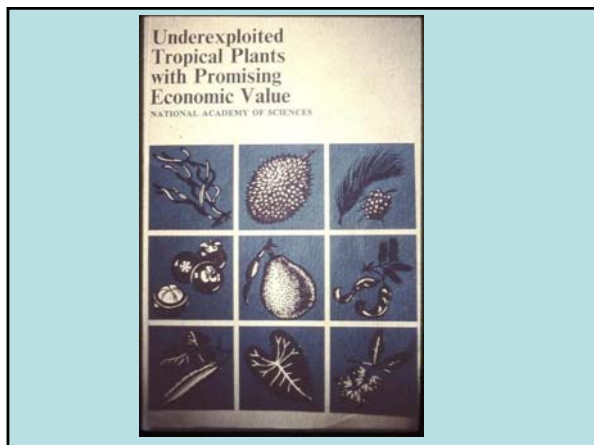
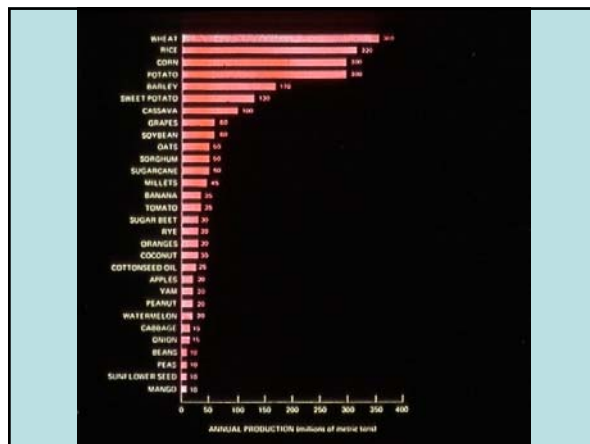


Winged Beans from Borneo



“Supermarket on a Stalk”

- Edible parts:
 - Leaves like spinach
 - Pods like green beans
 - Seeds
 - Tubers
 - Blossoms



Experiment with New Crops / Varieties



Control of Insects without Buying Commercial Insecticides

Bruchid Bean Beetle
Acanthoscelides obtectus

Source:
http://mcknight.ccrp.cornell.edu/program_docs/general/NRI_Legume_IPM_review2009.pdf

The Underground Forest



Now called "farmer managed natural regeneration"

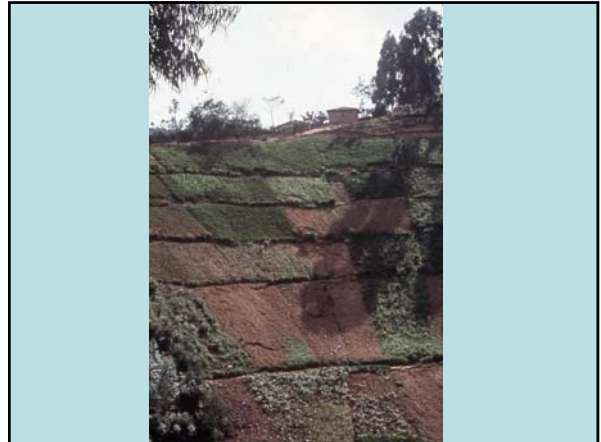


Problem: Poor Soil Fertility



Velvet Beans



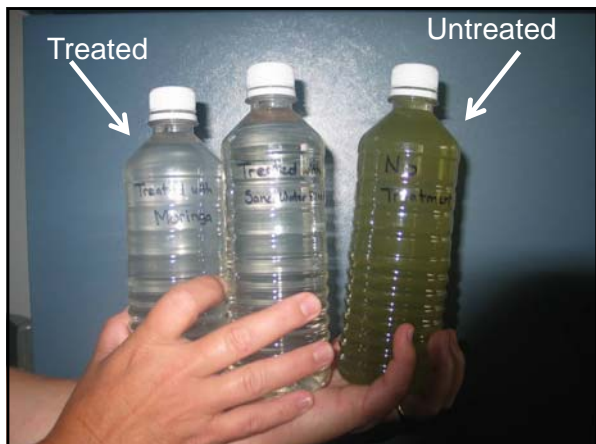


**“Nutricafe” (?)
5% by weight L-dopa!**



**How Might They Make this
Water Safe to Drink?**





Sun to Purify Water

- SODIS
Solar
Disinfection

A photograph showing three plastic bottles of water, similar to the first image. The two bottles on the left are clear and labeled 'Treated' with white arrows. The bottle on the right is a dark green color and labeled 'Untreated' with a white arrow. The bottles are being held by a person's hands.

Problem

- “Little livestock feed at the end of dry season. Farmers must slaughter several each year.
“Farmers don’t have the ability to put up hay to feed them.”

“Forage Banks” to Feed Livestock During the Dry Seson

A photograph of a man in a blue shirt and cap standing in a field of tall, green forage plants. The plants are arranged in rows, and the man is standing in the middle of the field.A collage of three images. The top image shows a cow in a feedlot. The bottom left image shows a man in a green shirt handling a large pile of green forage. The bottom right image shows a man in a green shirt standing next to a large pile of green forage.



Consider Potential of New Fruits Or New Varieties of Locally Popular Fruits

Tropical

Subtropical

Temperate



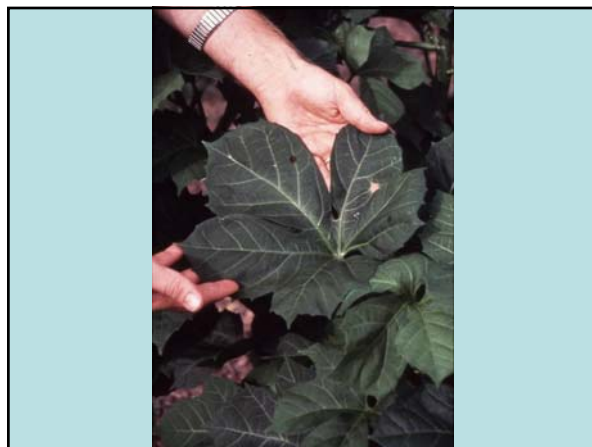
Problem

- It is hard to grow leafy vegetables.
 - Insects and farm animals eat the seedlings.
 - It is a lot of work for a farmer in ill health to plow, plant and weed the garden.
 - The vegetables may die if several days without rain.
- Solution: perennial vegetables

Advantages of Perennial Vegetables

- Far less labor
- Crucial for the sick and elderly
 - Especially HIV / AIDS patients
- No need to seek annual supply of seeds
- Can eat for years
- Less vulnerable to animals
- No till, so less erosion
- Plants must have disease / insect resistance to become perennials

Chaya—plant once, eat for years



Chaya in Rocks in Bahamas



What might her parents be praying about today?



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