GIS
Building Capacity to Improve the Environment

Catholic Relief Services
El Salvador Program
Norma Minero
Background
Background

Central America
The Government recognizes the water crisis and decreed emergency measures (April 14th, 2016)

Warn precarious situation of farmers (November 26th, 2015)
2014 and 2015 “Drought” (extreme dry seasons)

100,000 farmers hit hard
- maize and beans (80% losses)

Salvador Sanchéz Cerén
El Salvador President

Lina Pohl
Minister of Environment

Reduction in flow rivers (60%-95%)
Clean water scarcity

Orestes Ortez
Minister of Agriculture
El Salvador
Our surface water recharge area
Tools used before in mapping

Freehand

Freehand map
Guilty of using mapping to extract information
Opportunity: Implement the Geographic Information System

- Hardware
- Software
- Data / Information
- Analysis Processes
- Institutions / People

Map of El Salvador

US Dept of State Geographer
Data: SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat

Google Earth

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Stakeholders

National Government

National Agency

Local Government

Technical Support
How we do it?

Digital Soil Map
A-MANO Methodology

Combination of mapping and community development tools that empower local people to analyze their environment, monitor change over time, propose solutions, and plan for a better future in terms of livelihoods strengthening.
Step 1: Define the problem or opportunity
What issue is the municipality or community wanting to solve?

Step 2: Define the geographic area or territory
Step 3:

Print an satellite or aerial Image

(Source is usually Google Earth)

Size: 1.5 – 2 mt2
Cost: US$ 15
Step 4: Organize one or more workshops with local stakeholders
Create the map!
Step 5: Digitize the information generated, and reprint

Step 6: Participatory analysis and planning activities
Step 7:
Upload to an online, interactive map for monitoring and reporting
A case study: San Francisco community
Description of crop damage

Using seasonal stream for supplemental irrigation (dried in July)

Severely degraded watershed

On-farm soil degradation

Description of crop damage
San Francisco Community - surface water recharge area
Key successes A-MANO Methodology

Image has no data, but people can orient themselves based on recognizable landmarks

- Identified their house, farms, rivers, highways, bigger towns, peaks.

See patterns of degradation and conservation

- Many farms depend the seasonal stream for supplemental irrigation. The river dried in July 2014 (for the first time in their memory);
- They also recognized the condition of watershed of the stream;
- Quality of soils, contributing vulnerability to drought.

Enables people to perceive and plan at landscape scale (integrated, upstream-downstream)

- Watershed restoration to slow runoff and improve water recharge;
- Irrigation efficiency and water harvesting;
- Improve soil and crop management on-farm (greenwater focus).
Digital Soil Map

Purdue University

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Digital Soil Map

Methodology for predicting and mapping soil functional classes through the use of the property values of soil samples obtained in the field to produce continuous maps properties.
Our first maps produced

Soil Classes

Soil Depth

Máximo : 137cm
Minimo : 27cm
Learning

- We find that the geo-referencing is as good or better as using GPS’ in the field, because of user errors in the field with GPS units.

- Using satellite imagery to allow local stakeholders and development practitioners to utilize the map as a medium for information-exchange and help communities to see their conditions within a larger context and understand better their reality to promote their own development.

- Digital Soil Map predicts and mapping soil functional classes through the use of the property values of soil samples obtained in the field to produce continuous maps properties, to improved agricultural production systems through better knowledge of the soils.
Summary

• These methodologies (A-MANO and Digital Soil Map) are useful to building local and national capacities to improve the environment by integrating technology, based on the analysis of information and spatial processes.

• We couldn’t manage the agriculture and natural resources in a separately way, in small countries both are extremely related.

We need to manage natural resources!