SUSTAINABLE LANDSCAPES: THE FUTURE WE WANT

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THE DRAWING BOARD
THE STUDY AREA: SAN MARTÍN, PERU

• At the foothills of the Andes Mountains in the Upper Amazon River Basin

• Area: 51.2 thousand km2 home to 728 thousand people

• Main economic sector: Agriculture, forestry and hunting

• Complex landscape: mixed forests, wide range of elevation gradients, high biodiversity and threat
AGRICULTURAL SYSTEMS IN SAN MARTIN

% of national agricultural land in SM
Source: INEI

% of SM agricultural land
Source: INEI

% of total SM land area
Source: CI

Agriculture 5
Others 21
Ecosystems 74

Agriculture
Commerce
Food products
Construction
Milled Rice
Bedding and textiles
Chemicals and fuels
Ecosystems
Objectives:
1) Assess sustainability of production systems
2) Forecasting and scenario building to optimize landscape production
IS A PRODUCTION SYSTEM SUSTAINABLE?

• Is it financially profitable?
• Does that leave low environmental footprint?
• Does that make social equity?
“DASHBOARD” OF SUSTAINABILITY (STYLED, NOT VALIDATED)
SUSTAINABILITY IN THE FUTURE CONDITIONS

Shape code
Rectangles = Parameters
Circles = Variables

Color code
 undesired outcome
 Desired outcome
 Parameters/inputs

Food demand (rice)
Food production area
Population
Yield
Financial return (coffee)
Price
Area
Deforestation
Emission

Food demand (rice) → Population
Crowd control

Food production area → Yield

Yield → Financial return (coffee)

Financial return (coffee) → Price

Price → Area

Area → Financial return (Cocoa)

Financial return (Cocoa) → Previous year's area (rice+coffee+cocoa)

Previous year's area (rice+coffee+cocoa) → Deforestation

Deforestation → Emission

C density

Emission
MODEL INPUTS

- **Coffee yield (kg/ha)**
- **Cacao yield (kg/ha)**
- **Rice yield (T/ha)**
- **Coffee unit price ($/kg)**
- **Cacao unit price ($/kg)**
- **Rice unit price ($/kg)**
- **Population**
- **Rice PCC (kg)**
- **C density (tCO2/ha)**
PROJECTIONS (UNCONSTRAINED)

Area forecast for different production systems (Hectares)

Revenue forecast for different production systems (\$000 US$)

Cumulative deforestation (Hectares)

Cumulative emission (tCO2)
AGRICULTURAL SUITABILITY ANALYSIS

- Depending on the crop, areas of expansion in suitability in 2050 will vary 4-19%.
- The crops with the highest areas of potential expansion are oil palm, cassava (19%) and rice (18%)
- Corn is projected to expand in only 4% in the future based on areas currently suitable, but can potentially experience a reduction in suitable area of 47%.
- Losses in the area suitable for production of the other 3 crops are smaller, ranging from 2-14%.
WHAT INFORMATION IS NEEDED TO SCALE UP INVESTMENT IN SUSTAINABLE LANDSCAPES?

- Investors and commodity sourcing companies
  
  *Is this a good place to invest?*

- National and sub-national governments and international development institutions
  
  *How to impact green growth and sustainable development?*

- Landscape level governments, managers, producers and their partners
  
  *Are we investment ready?*
SUSTAINABLE LANDSCAPES “RATING TOOL”

• Structured set of criteria for key policy and governance conditions
• Themes
  • Land use planning and management
  • Land and resource tenure
  • Biodiversity and ecosystem services
  • Stakeholder coordination and participation
  • Commodity supply chains
• Formats
  • Scorecard: summary of rating for each criterion A = high/full/clear, B = medium/partial, C = low/not addressed
  • Assessment: detailed evidence for rating with links to supporting information (laws, reports, data etc.)
INTEGRATED ANALYSIS
INDICATORS OF LANDSCAPE SUSTAINABILITY

- Deforestation and fragmentation
- Biodiversity
- Crop production for export and for the region
- Carbon balance
- Food/Water/Energy regional availability and consumption
- Water quantity and quality
- Household Poverty
- Income contribution to national GDP and inequality distribution
CONCLUSIONS

• Landscapes generate a wide range of ecosystem goods and services for different beneficiaries

• But we cannot maximize all the goods and services all at the same time. People make choices on the future they want based on tradeoffs and synergies

• A landscape approach gives an opportunity to understand the teleconnections impacting the landscape

• An integrated model that we proposed here provides a forward-looking framework for understanding landscape scenarios now and into the future