Analysis, Synthesis, Design of Solutions

Identification and prioritization of problems, Problem Statement
Systems Perspective
- Preliminary Design and Work Plan -
Analysis

• **Systematic identification and prioritization of problems.** Use causal analysis (problem tree and solution tree): cause and effect relationships

• **Planning of solutions:** Use Action ID matrix; potential partner matrix; multiple criteria assessment matrix
Low Crop Yields

- Low Income from Cash Crops
  - Insufficient Cash Crops
  - Low Productivity due to Malnutrition

- Weak Economy Overall
  - Weak Farming Industry
    - Less Farmers/Sellers
    - Less Food
    - Decrease Food Quality

- High Mortality Rate
  - Increased Sickness
    - Poor Health

- Water Quality
  - Pesticide/Fertilizer Overuse

- Lack of Agriculture Knowledge
  - Lack of Business Knowledge
  - Lack of Farming Knowledge
  - Poor Distribution System
  - Wet Season vs. Dry Season
  - Little water
  - Poor Soil Quality

- Little water
- Poor Soil Quality

- Lack of access to markets outside the community
  - Lack of Organization
  - No Training
  - Damaged Irrigation Canals
  - No Accountability
  - Maintenance
  - Supplies & Resources

- Decrease Food Quality
- Poor Health

- Less Farmers/Sellers
- Less Food

- Farmers Not willing to Invest in Change
- Low Crop Yields

- Lack of Education
  - Lack of Knowledge of Soil Nutrition & relationship to crop yield
  - Deforestation
  - Pesticide/Fertilizer Overuse

- Lack of Government Support
- Corruption

- Low Income from Cash Crops
- Insufficient Cash Crops
- Low Productivity due to Malnutrition

- Lack of Business Knowledge
- Lack of Farming Knowledge

- Education
- No Accountability
- Maintenance
- Supplies & Resources

- Best Food
- Poor Health

- Farmers Not willing to Invest in Change
- Low Crop Yields

- Lack of Education
- Lack of Knowledge of Soil Nutrition & relationship to crop yield

- Corruption
Key Root Causes and Effects

Need to:

• show good potential to make a significant impact and contribution if eliminated;
• make sense to community stakeholders;
• have major impact through synergy, collaboration, and partnering; and
• be achievable and measurable with the existing skills and resources of locals and outsiders.
# Action ID matrix

<table>
<thead>
<tr>
<th>Problems (effects and causes to tackle)</th>
<th>Solutions (objectives)</th>
<th>Potential actions (outputs)</th>
</tr>
</thead>
</table>
| Not enough water reaching crops (cause) | Provide water for crops during dry season | • Construct new irrigation canals  
• Train maintenance people to repair old, damaged canals  
• Implement drip irrigation systems  
• Construct water storage facilities to provide water during dry season |
| Limited access to markets (cause) | Increased access to markets | • Implement greenhouse farming system to allow off-season crop growth  
• Switch to herbal intensive farming  
• Educational campaign for co-op program |
| Deforestation leading to erosion (cause) | Reforestation | • Implement forestry management system (controlled harvesting and replanting)  
• Education campaign on importance of forests  
• Plant trees at field boundaries to create buffer zones for erosion control and wildlife habitat  
• Implement forest integration farming to reduce deforestation for expansion of agriculture |
| Poor soil quality (cause) | Improve soil quality | • Switch to crops more suited to environment  
• Implement organic farming methods  
• Provide education about sustainable agricultural methods  
• Begin program to use animal and plant waste in place of chemical fertilizers  
• Implement soil erosion control systems |
## MCUA Matrix

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
<th>Score</th>
<th>Weight</th>
<th>Score</th>
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</table>
Project Hypothesis

- **Anticipated outcome** - improve household livelihood security through increased income opportunities and increased food security.

- **Problem being addressed** - low crop yield due to lack of water and energy production.

- **Critical causes to the problem** being addressed:
  - **Energy**: lack of technical expertise, inability to transfer energy to all wards, lack of energy infrastructure, lack of technical education, etc.
  - **Water and crop yield**: lack of agricultural knowledge, not enough water, poor distribution system, lack of business knowledge, damaged water infrastructure, lack of maintenance, lack of education, etc.

- **Relationships between the problem’s causes and effects** - see problem tree

- **Effects and impacts of possible interventions** - see solution tree

- **Rating of the various interventions** - see MCUA matrix

- **Assumptions and pre-conditions** necessary to support the project hypothesis – see logframe
| What | • What needs to be accomplished and in what order of priorities?  
|      | • What represents success and impact?  
|      | • What external and internal factors in the community could jeopardize success?  
|      | • What are the short and long term benefits to the community?  
|      | • What other institutions/agencies inside and outside in the community need to be involved?  
|      | • What strategies will be used in addressing conflict and disagreement between parties?  
|      | • What are the strengths and weaknesses of the partners?  
| Who  | • Who are the partners and stakeholders?  
|      | • Who will manage the project?  
|      | • Who will be responsible for project strategy, operations and management?  
| When | • When would be an appropriate time to carry out the project?  
|      | • When will the various project activities take place and their duration?  
| Where| • Where will activities take place?  
|      | • Where are the needed resources located?  
|      | • Where is the manpower?  
| Why  | • Why are we conducting the various tasks?  
|      | • Why are we involving this partner or group?  
|      | • Why is it important to have and meet deadlines?  
| How  | • How will the project be funded?  
|      | • How will the project be managed?  
|      | • How will any disagreement with and within the community be handled?
## Action Feasibility matrix

<table>
<thead>
<tr>
<th>Responsible actors</th>
<th>What contributions should they make?</th>
<th>What benefits will they get in the short run?</th>
<th>What should they do to ensure a long-standing ‘solution’?</th>
<th>What benefits will the solution bring to them in the long run?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest group</td>
<td>Labor for construction, startup investment, full participation in sustainable agriculture</td>
<td>Increased crop yields empowerment of farming community</td>
<td>Maintain program and monitor &amp; evaluate components for optimization, continued fund development, identify community member to perform maintenance</td>
<td>Increased sustained crop yields, increased cash crops, improved environment leading to higher food security and better health</td>
</tr>
<tr>
<td>Community at large</td>
<td>Support of new farming system funds, input from their perspective, conduct PAR</td>
<td>More food and greater economic base for community</td>
<td>Assistance with monetary support labor needs where necessary, basic knowledge/education of agricultural practice</td>
<td>Same as above</td>
</tr>
<tr>
<td>Local government agency (VDC)</td>
<td>Initial funding &amp; technical support for design and maintenance, training support</td>
<td>Less dependency from community, community support and partnership</td>
<td>Continued support and regular monitoring &amp; evaluation, some funding, continued technical assistance, follow-up</td>
<td>Community independence, increased ability to collect donations for other projects due to increased cash crop yields</td>
</tr>
<tr>
<td>NGO partner (NCDC)</td>
<td>Support &amp; initial funding, training and support for design and maintenance, training support</td>
<td>Same as above</td>
<td>Same as above</td>
<td>Community capacity for other projects increased</td>
</tr>
</tbody>
</table>