Drivers of Intensive Agriculture Expansion in Ampusonganan Watershed, Benguet, Philippines

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PRESENTATION OUTLINE

• RATIONALE

• OBJECTIVE

• METHODOLOGY

• KEY FINDINGS

• RECOMMENDATIONS

• TAKEAWAYS
RATIONAL

• food, livelihood, forest and people are key factors to sustainable development
• agriculture intensification is needed to achieved food security
• forests are crucial to agriculture and food security, however are threatened
• sustainable progress are coherent and integrated
• protecting key players and vulnerable people
• People engagement to understand problems at the local setting
Tropical Lower Montane Rainforest
FOOD

SECURITY

http://foodevolution.com.ph/2016/02/government-eyeing-cut-palay-production-cost-
Edible mushrooms
Edible fresh water species

https://www.google.com.ph/search?q=EDIBLE+BULL+FROGS+IN+BENGUET&espv=2&biw=1366&bih=638&source=lnms&tbm=isch&sa=X&ved=0ahUKEwid1Jb27Z_SAhUIKpQKHQe9AY8Q_AUIBigB#imgrc=xdIBVZLqG4y8M:
Watershed forests are cultivated from headwaters going down
Forest in some headwaters are almost gone
CHALLENGE???

...a need of conserving the forest to safeguard watershed services while sustaining agriculture...
OBJECTIVE

Understanding the reasons of agriculture expansion in forested areas

Aide in developing better planning, policy making and management
METHODOLOGY

- **Systems theory** using the landscape or watershed approach

- KII and Household survey based on **Central Limit Theorem (CLT)**
• Statistical data analysis (IBM SPSS Version 20 program)

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Statistical Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test for independence for categorical data</td>
<td>Chi-square test ($\chi^2$), and Fishers’ Exact Test</td>
</tr>
<tr>
<td>degree of relationship/correlation of two variables</td>
<td>Pearson Correlation Analysis</td>
</tr>
<tr>
<td>compare the means of two or more samples for numerical data</td>
<td>One-Way ANOVA</td>
</tr>
<tr>
<td>determine specific significant relationship</td>
<td>Tukey Post Hoc Tests</td>
</tr>
</tbody>
</table>
KEY FINDINGS

**LIVELIHOOD DISTRIBUTION**

- Respondents (N=210)
  - Farming: 178,847.76%
  - Non-farming: 11,524%
  - Both: 21,10%

**ETHNICITY INFLUENCE**

- Respondents (N=210)
  - IP/NATIVE:
    - Farming: 161, 95.27%
    - Non-farming: 8, 4.73%
  - MIGRANT:
    - Farming: 38, 92.68%
    - Non-farming: 3, 7.32%

**Finding**: More than 90% are farming

**Finding**: Both natives and migrants are actively engaged
Agriculture engagement cut across gender and ages.
LAND TENURE STATUS?

Farm tenure distribution in the Ampusongan watershed
High percentage of wanting to expand farms
And engage in farming
Socio-economic reasons of farm expansion

Drivers of farm venturing

- Growing family needs: 0.770**
- No alternative livelihood: 0.516
- Better income in farming: 0.356
- Capital/supplier availability: 0.624*
- Others: 0.289

Reasons of farm expansion

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing family needs</td>
<td>157</td>
</tr>
<tr>
<td>Decreasing productivity of farm</td>
<td>100</td>
</tr>
<tr>
<td>No alternative livelihood</td>
<td>82</td>
</tr>
<tr>
<td>Better income in farming</td>
<td>54</td>
</tr>
<tr>
<td>Capital/supplier availability</td>
<td>105</td>
</tr>
<tr>
<td>Increase production &amp; income</td>
<td>34</td>
</tr>
</tbody>
</table>

Socio-economic reasons of farm expansion
Farmers source of capital in farming

- Personal: 37%
- Loan: 13%
- Personal and Loan: 5%
- Personal and supply: 7%
- Supply: 39%
High percentage of wanting to expand farms and engage in farming

Expand farming in forest

- No: 25%
- Yes: 52%
- Not sure for now: 23%

Venture farming in forest

- No: 22%
- Yes: 78%
Reasons of farm expansion into forested areas

- Maximize use of land: 98.81% of respondents
- Reinforce/protect tenure: 23.81% of respondents
- No more open space to cultivate: 72.52% of respondents
- Open resource: 72.52% of respondents

Reasons why venture farm in forested areas

- Maximize use of land: 85.71% of respondents
- Reinforce/protect tenure: 42.86% of respondents
- No more open space to cultivate: 57.14% of respondents
- Forest is an open resource: 42.86% of respondents

Number of respondents: 83
Different criteria in selecting farm sites

**Criteria in choosing farm site**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Number of Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land ownership</td>
<td>153</td>
</tr>
<tr>
<td>Accessibility</td>
<td>157</td>
</tr>
<tr>
<td>Water availability</td>
<td>150</td>
</tr>
<tr>
<td>Soil Fertility</td>
<td>136</td>
</tr>
<tr>
<td>Vegetation Cover</td>
<td>133</td>
</tr>
<tr>
<td>Slope</td>
<td>144</td>
</tr>
<tr>
<td>Policies</td>
<td>5</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
</tr>
</tbody>
</table>

**# of respondent (161)**

**Criteria in choosing farm site**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Number of Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land ownership</td>
<td>9</td>
</tr>
<tr>
<td>Accessibility</td>
<td>9</td>
</tr>
<tr>
<td>Water availability</td>
<td>6</td>
</tr>
<tr>
<td>Soil Fertility</td>
<td>5</td>
</tr>
<tr>
<td>Vegetation Cover</td>
<td>5</td>
</tr>
<tr>
<td>Slope</td>
<td>5</td>
</tr>
<tr>
<td>Policies</td>
<td>1</td>
</tr>
</tbody>
</table>

**# of respondent (9)**
High percentage prefer to farm close to road system.

**Presence of road**
- Farmers: [VALUE], 77.78%
- Non-Farmers: [VALUE], 92.99%

**Proximity to residence**
- Farmers: 14.01%
- Non-Farmers: 22%

**Easy to clear**
- Farmers: [VALUE]
- Non-Farmers: [VALUE]
Agricultural areas are closest to road system.

**Land Cover within the 200m Road Buffer**

**Legend:**
- Broadleafed forest: 685.35ha (27.11%)
- Grassland: 328.68ha (32.83%)
- Benguet pine forest: 1,203.84ha (38.39%)
- Rice field: 80.10ha (46.35%)
- Watershed boundary
- Road network

- **Farm & residential areas: 973.98ha (74.60%)**
Forest are most preferred in farming

- Broadleaved Forest: 57.25%
- Pine Forest: 13.77%
- Grassland: 23.91%
- Brush land: 5.07%

Farmers
- Broadleaved Forest: 40%
- Pine Forest: 40%
- Grassland: 20%

Non-Farmers
- Farming is preferred in Broadleaved Forest.
An increase in poverty likelihood will result in an increase of farmer frequency.
Changing land use/ crops (agriculture) as adaptation to increasing financial needs
Most preferred clearing or improvement methods
Devastating impacts to unregulated use of heavy equipment in agriculture similar to road construction
Aggravating Factors

• absence of land use policies and poor implementation of laws
• overlapping and conflicting management objectives
• slow and ineffective functioning of stakeholders
Options/circumstances that would minimize farm expansion

<table>
<thead>
<tr>
<th>Reason</th>
<th>Perception Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Market Price</td>
<td>40.95</td>
</tr>
<tr>
<td>Sustained productivity</td>
<td>32.86</td>
</tr>
<tr>
<td>Secured Land Tenure</td>
<td>8.57</td>
</tr>
<tr>
<td>Stable Alternative Livelihood</td>
<td>63.33</td>
</tr>
<tr>
<td>Acceptable PES/PWS</td>
<td>94.76</td>
</tr>
<tr>
<td>Others</td>
<td>48.10</td>
</tr>
</tbody>
</table>

**Note:**
- **0.001**
- **0.059**
- **0.000**
- **0.461**
- **0.014**
RECOMMENDATIONS

• institutionalizing reward mechanisms for sustainable land use
• promotion of forest conservation associated livelihoods
• strengthening and accelerating individual land titling
• strengthening land use regulation, policy implementation and monitoring
• strengthening and localizing information, education, campaign (IEC)
• suitability assessments to guide conservation, production and restoration
• policies to stop unsustainable land use and unproductive lands
TAKE AWAYS

1. Social-protection through actions based primarily on societal needs and interest

2. Accelerated integrated land-use planning and implementation

3. Collaboration and harmonization among stakeholders
“THINK GLOBALLY, ACT LOCALLY”
Thank you so much 😊