Geographical Analysis on the Impact of Landcover Changes on Socio–Economic Condition of Bawlakhe District, Kayah State in Myanmar

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Introduction

- Kayah State - South eastern parts of Myanmar / Bawlakhe District – Southern part of Kayah State
- Three townships / area - 1994.77 sq. Miles (5166.45 sq. km)
- 3 Township / 20 Village Tracts / 86 villages
- The main River - Than Lwin River
- Races - Kayah, Shan, Yintale, Kayaw, Kayan
Research questions:

1. What are the current livelihoods in the four villages?
2. What have been the landscape changes from 1995 to 2015?
3. Why has land cover changes occurred in Study Area?
4. How have land cover changes affected on socio-economic conditions in Balakhe District?
5. What is the current land cover governance and how could it be strengthened to support local livelihoods?
The study area chooses four criteria: locations near the Thanlwin River, far from the Thanlwin River, densely forest area, and less dense forest area. Topographic maps (1: 50000) UTM used for base map. Field survey, Structured interview and questionnaires and ground check for Land cover to detect the land use condition. Landsat TM Imageries for the years 1995, 2005, 2010 and 2015 / combine of different classification. Remote Sensing technique - to analyze land cover classification and land cover condition.
The Study Site in Bawlakhe District
Before 2010: Period of Armed Conflict

- Before 2010 - no peaceful / not easy to connect from Bawlakhe and others Area
- majority of land cover - the forest land
- Respondents - between 10-15 years ago - the previous land cover type - “forest”
- up to 15 years – “wild forest”
- forest types - rich in many species and valuable timber

- Local people - use the forest to support their livelihoods
- Before 2010 - logging company - prevented - access logging area due to the risk of attack and land mines
- Little logging worked by local people and armed forced in this area
2010 - 2015: Follow the Peace Agreement

- The remarkable changes of the land use occurred between 2010 to 2015.
- The most Land use change occurred in the central part of the study area.
- After 2010 - between the military and armed groups, signed/security improved, allowing private, government, and others logging companies access to forests and causing over-logging to occur.
- Forest cover dramatically changed after the 2010 peace agreement because legally and illegally timber extraction.
1st April 2016, New Government stopped one year timber extraction in the whole country

- the government drew a plan and gave aid to villages for rural area development / plays a major role for development with the settlement of town and villages

- The main economy of the study area - timber extracting
- limitation of forest production, people in this area faced livelihood problems/ timber extraction has moved inside the forest area

- Some people moved to other areas
- Hose - located near Thai- Myanmar Border Area - some families (other parts of Kayah State and Shan State) - moved - for their economy / they worked to Thai Myanmar border Area

migrants
### Table (3)  Land cover types in Bhuku Village

<table>
<thead>
<tr>
<th>Land cover types</th>
<th>1995</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Tropical Hill Forest</td>
<td>3326.2</td>
<td></td>
<td>0.01</td>
</tr>
<tr>
<td>Savanna Forest</td>
<td>9</td>
<td>6.13</td>
<td>0.01</td>
</tr>
<tr>
<td>Tropical Wet Evergreen</td>
<td>2918.4</td>
<td>6466.6</td>
<td></td>
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<tr>
<td>Hill Forest</td>
<td>220.94</td>
<td>6.08</td>
<td>0</td>
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<tr>
<td>Paddy Land</td>
<td>13.38</td>
<td>5.54</td>
<td>1.05</td>
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<tr>
<td>FellowLand</td>
<td>11.71</td>
<td>0.21</td>
<td>0.15</td>
</tr>
<tr>
<td>Water body</td>
<td>0.00</td>
<td>0.21</td>
<td>0.00</td>
</tr>
<tr>
<td>Settlement</td>
<td>0.12</td>
<td>6.62</td>
<td>2.09</td>
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### Table (5) Land Cover Condition of Wanaung Village

<table>
<thead>
<tr>
<th>Land cover type</th>
<th>1995</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Tropical Hill Savanna Forest</td>
<td>0.11</td>
<td>0.74</td>
<td>0.00</td>
</tr>
<tr>
<td>Tropical Wet Evergreen Forest</td>
<td>5797.97</td>
<td>6452.92</td>
<td>0.28</td>
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<tr>
<td>Sub-Tropical Wet Hill Forest</td>
<td>695.29</td>
<td>7.97</td>
<td>6480.9</td>
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<tr>
<td>Paddy Land</td>
<td>13.43</td>
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<td>FellowLand</td>
<td>4.12</td>
<td>4.71</td>
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<tr>
<td>Water body</td>
<td>21.19</td>
<td>13.26</td>
<td>18.04</td>
</tr>
<tr>
<td>Settlement</td>
<td>1.33</td>
<td>9.77</td>
<td>13.93</td>
</tr>
</tbody>
</table>
## Table 4 Land Cover Changes in Wanpala

<table>
<thead>
<tr>
<th>Land Cover type</th>
<th>1995</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Tropical Hill Savanna Forest</td>
<td>2066.55</td>
<td>674.95</td>
<td>99.00</td>
</tr>
<tr>
<td>Tropical Wet Evergreen Forest</td>
<td>4633.46</td>
<td>6518.43</td>
<td>658.76</td>
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<tr>
<td>Sub-Tropical Wet Hill Forest</td>
<td>545.83</td>
<td>90.46</td>
<td>6510.27</td>
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<tr>
<td>Paddy Land</td>
<td>2.96</td>
<td>8.83</td>
<td>1.74</td>
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<tr>
<td>FellowLand</td>
<td>25.87</td>
<td>0.49</td>
<td>0.34</td>
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<tr>
<td>Water body</td>
<td>21.19</td>
<td>4.45</td>
<td>13.35</td>
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<tr>
<td>Settlement</td>
<td>3.64</td>
<td>1.89</td>
<td>16.04</td>
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### Table (6) Land Cover Conditions of Hose Village

<table>
<thead>
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<th>Land Cover Type</th>
<th>1995</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Tropical Hill Savanna Forest</td>
<td>2066.69</td>
<td>714.37</td>
<td>3.28</td>
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<tr>
<td>Tropical Wet Evergreen Forest</td>
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<td>659.49</td>
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<tr>
<td>Sub-Tropical Wet Hill Forest</td>
<td>540.06</td>
<td>23.48</td>
<td>6507.28</td>
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<tr>
<td>Paddy Land</td>
<td>27.50</td>
<td>37.90</td>
<td>26.21</td>
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<tr>
<td>Fellow Land</td>
<td>17.06</td>
<td>5.01</td>
<td>11.14</td>
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<tr>
<td>Water body</td>
<td>21.19</td>
<td>13.26</td>
<td>13.35</td>
</tr>
<tr>
<td>Settlement</td>
<td>1.26</td>
<td>22.71</td>
<td>4.06</td>
</tr>
</tbody>
</table>
Synthesis of the Results of Field Survey Interview and Questionnaires

- The main economy - depends on forest production / shifting agriculture
  - the people - living in more than 10 year - interviewed of their for land cover condition
    - saying that the flora and fauna diversity in decreased / their income – decreased / impact on socio-economic conditions
- Uses of remote sensing techniques- recommended for better planning and sustainable management of land cover area in Bawlakhe District
- The remarkable changes - occurred from 2005 to 2015
  - in the central part of the study area due to st Land use change the easily access to productive area
  - a lack of plan for natural resource conservation and utilization - led to socio-economic and environment problems
nearly 95% of the people - non-educated / the rest of people - primary level
needs to - realize the importance of forest land conservation and its benefits to the people
Forest – gift of the nature / no investment and get many profit
found that land use changed - due to the gap of knowledge for environmental conservation
cultivated lands - shifting cultivation
the main fuel is fire wood and they used stem of plants and other parts of plant are not used as a fuel
CURRENT LAND COVER GOVERNANCE AND HOW COULD IT BE STRENGTHENED TO SUPPORT LOCAL LIVELIHOODS

• The main economy - depends on forest production and the region’s steadily declining forested land
• lack of plan for natural resource conservation and utilization
• Government - provided the awareness of environmental conservation and land use development policy for the development of local ethnic people / established the community based natural resources management in villages
• to provide local and regional decision makers with accurate information to understand the advantages and disadvantages of land use changes, protection from the forest depletion and environmental problem
According to political condition
- Before 2010 - most of the people are left to their home and they stayed another area / At present - come to their home and reestablished 
- to support and promote their livelihood conditions of local people 
- The government and local organizations co-operated to raise funds and support aids to solve the poverty alleviation

In agricultural sector
- the local authorities made a plan / to develop this area to do more works in agriculture - from subsistence to intensive farming 
- the local people use special high yield crops with new methods 
- More educative talks - to the local people with decreasing shifting cultivations acreages 
- Moreover government - strengthen the institutional capabilities in wild life management and forest conservation
Key Messages.

• The main economy of local people in these areas depends on forest production and the region’s steadily declining forested land.
• There is a lack of plan for natural resource conservation and utilization.
• Government must be provided the awareness of environmental conservation and land use development policy in the area for planning and development of local ethnic people.
• Government should be established the community based natural resources management in villages.
Thank you for your attention