How Andean Farmers manage their diversity with special reference to potato

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Production Zones for Potatoes

• 284,000 ha in 19/24 departments
• 3.3 Million tons /year:
  • 12 tn/ha
• 96% in the highlands
• 40% above 3800 m.a.s.l
• 20-50% commercial
• 50-80% subsistence

Technology 5.2% tractors 26.4 % bulls, and 68% hand tools (foot plow)
**Cultivated potato species**

Native potatoes diversity under custody at CIP

<table>
<thead>
<tr>
<th>Taxonomic group</th>
<th>Accessions</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>S. stenotomum</em></td>
<td>267</td>
</tr>
<tr>
<td><em>S. goniocalyx</em></td>
<td>87</td>
</tr>
<tr>
<td><em>S. phureja</em></td>
<td>196</td>
</tr>
<tr>
<td><em>S. ajanhuiri</em></td>
<td>14</td>
</tr>
<tr>
<td><em>S. juzepzuckii</em></td>
<td>36</td>
</tr>
<tr>
<td><em>S. chaucha</em></td>
<td>163</td>
</tr>
<tr>
<td><em>S. tuberosum ssp andigena</em></td>
<td>2864</td>
</tr>
<tr>
<td><em>S. tuberosum ssp tuberosum</em></td>
<td>147</td>
</tr>
<tr>
<td><em>S. curtilobum</em></td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3833</strong></td>
</tr>
</tbody>
</table>
Family is the basis of maintenance of diversity: Heterogenous.

Average per family = 8 total community = 122
Steep slopes

Presence of wild species in Mixtures (chalo, chaqro)

Hand tools
Sectoral Fallow system

Disintegration to family plots (unsustainable)

Dramatic increase in soil borne diseases

Fig. 7 Disintegration of Sectorial Fallow/Rotation Systems
3 methods of **tilling** soil  3 varieties 2 altitudes  2006-7
Food and nutrition

- Potato: 73%
- Other: 5%
- Dairy: 3%
- Cereals: 6%
- Vegetables and fruits: 13%
Vitamina C content in native varieties

Effect of cooking method in Vitamin C retention
The role of extreme events in changing composition in fields (Frost 2007)

3 days after frost affected a field of 100 repatriated varieties
Some varieties tolerate temperatures of $-7^\circ$C
Processed freeze-dried potatoes
Late blight
2009-2010
Late blight resistance for native potatoes bred with selections from other areas challenge how will they use it?
Conclusions

- No genetic erosion
- Area is increasing (at expense of fallow and long rotations)
- Support system is still not in place but the following have helped
  - In situ conservation project
  - Participative selection of new breeding lines
  - Linking to lima market ±
- Have not helped: Government support
- Improved varieties
Strengthen their own coping mechanisms

- local seed system
- resilience mechanisms
  - Increase resilient mixtures
  - Mutual help (yanapanakui)
  - **Water** harvesting and sources of irrigation
  - **Antierosion** build up of soils. (pastures and fodder, animal raising, manure trees and bushes)

- Linking to better markets
- Better nutrition
Thank you for your attention