Country Report

Nepal

The 1st Annual Meeting on the Asian Pacific Network for Testing of Agricultural Machinery (ANTAM)

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Nepal Agricultural Research Council
Introduction (Country Background)

- Land area 147181 sq km (EW-885 km, NS-193 km)
- Population 26.67 M
- Three geographical region Terai, Hill & Mountain
- Elevation ranges from 70 m to 8848 m
- Climate temperate to sub tropical
- Rugged terrain and diversity (in all sense) the typical feature
Physiographic regions

- High Himalaya
- High Mountain
- Middle Mountain
- Siwalik
- Terai

Source: WWF 2005
<table>
<thead>
<tr>
<th>Eco Zone</th>
<th>Percentage</th>
<th>Climate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountain</td>
<td>35%</td>
<td>Sub Alpine</td>
</tr>
<tr>
<td>Hill</td>
<td>42%</td>
<td>Cool Temperate</td>
</tr>
<tr>
<td>Terai (Plain)</td>
<td>23%</td>
<td>Sub Tropical</td>
</tr>
</tbody>
</table>
Climate

- Warm sub-tropical to cool temperate climate based on altitude.
- 80% rainfall - monsoon (June- Sept.)

Season
- Spring (Mar, Apr, May)
- Summer (Jun, July, Aug),
- Autumn (Sep, Oct, Nov ),
- Winter (Dec, Jan, Feb)
## Population 2011 census

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>12,849,041</th>
<th>48.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>13,645,463</td>
<td>51.5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26,494,504</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Population growth rate: 1.35%

Household Number: 5,427,302
### Land

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Area (000 ha)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land Cultivated</td>
<td>3090</td>
<td>21</td>
</tr>
<tr>
<td>Agricultural Land Uncultivated</td>
<td>1030</td>
<td>7</td>
</tr>
<tr>
<td>Forest Including Shrubs</td>
<td>5828</td>
<td>40</td>
</tr>
<tr>
<td>Grass Land Pasture</td>
<td>1766</td>
<td>12</td>
</tr>
<tr>
<td>Water</td>
<td>383</td>
<td>3</td>
</tr>
<tr>
<td>Others (snow and rocks)</td>
<td>2620</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14718</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Irrigated Area: 1,254,271 ha = about 40%
(20% of this is year round irrigation)
Nepalese Agriculture

- Agrarian country with 34% of GDP from agriculture sector
- 65% of population directly dependent on agriculture
- Agroecological and socio economic diversity
- Dominance of subsistence and small holder agriculture
- More than 60% rain-fed agriculture
- Young people moving away from agriculture
- Even though, Nepal has a negligible share of 0.025% in the global emission of GHGs it is the 4th most vulnerable country due to global climate change.
- Food and nutrition security at risk due to climate change
### Area and Production of Cereal Crops, 2012/2013

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area (ha.)</th>
<th>Production (mt.)</th>
<th>Yield (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddy</td>
<td>1420570</td>
<td>4504503</td>
<td>3171</td>
</tr>
<tr>
<td>Maize</td>
<td>849635</td>
<td>1999010</td>
<td>2353</td>
</tr>
<tr>
<td>Millet</td>
<td>274350</td>
<td>305588</td>
<td>1114</td>
</tr>
<tr>
<td>Wheat</td>
<td>754243</td>
<td>1727346</td>
<td>2290</td>
</tr>
<tr>
<td>Barley</td>
<td>29598</td>
<td>33782</td>
<td>1141</td>
</tr>
<tr>
<td>Buckwheat</td>
<td>10681</td>
<td>10056</td>
<td>941</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3339077</strong></td>
<td><strong>8580285</strong></td>
<td><strong>2570</strong></td>
</tr>
<tr>
<td>Crop</td>
<td>Area (Ha)</td>
<td>Production (Mt)</td>
<td>Productivity</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Oilseed</td>
<td>214,835</td>
<td>179,145</td>
<td>0.834</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>64,472</td>
<td>2,930,047</td>
<td>45.447</td>
</tr>
<tr>
<td>Jute</td>
<td>10,540</td>
<td>14,424</td>
<td>1.369</td>
</tr>
<tr>
<td>Lentil</td>
<td>207,630</td>
<td>208,201</td>
<td>1.003</td>
</tr>
<tr>
<td>Chickpea</td>
<td>9,154</td>
<td>8,192</td>
<td>0.892</td>
</tr>
<tr>
<td>Pigeon pea</td>
<td>17,471</td>
<td>14,082</td>
<td>0.806</td>
</tr>
<tr>
<td>Black gram</td>
<td>27,496</td>
<td>22,482</td>
<td>0.818</td>
</tr>
<tr>
<td>Grass pea</td>
<td>9,176</td>
<td>8,747</td>
<td>0.945</td>
</tr>
<tr>
<td>Horse gram</td>
<td>7,867</td>
<td>5,855</td>
<td>0.744</td>
</tr>
<tr>
<td>Soybean</td>
<td>29,282</td>
<td>28,270</td>
<td>0.965</td>
</tr>
<tr>
<td>Fruits</td>
<td>101,233</td>
<td>1,029,754</td>
<td>10.172</td>
</tr>
<tr>
<td>Vegetables</td>
<td>245,037</td>
<td>3,298,816</td>
<td>13.463</td>
</tr>
<tr>
<td>Potato</td>
<td>190,250</td>
<td>2,584,301</td>
<td>13.584</td>
</tr>
</tbody>
</table>
Mechanization Technologies Used
Animate power major source

Stationary engine, two wheel power tiller and 4 wheel tractors are considered

The mechanical power is concentrated in terai 92%
Trend of Tractor Registered in Nepal

![Graph showing the trend of tractor registrations in Nepal from 1989/90 to 2012/13. The graph indicates a significant increase in tractor registrations in recent years, particularly noticeable in 2009/10 and 2010/11.]
Farm Power Used in Agricultural Operation in Terai

![Bar chart showing farm power used in different agricultural operations in Terai.](image-url)
## Status of Agricultural Mechanization

(Source: National Sample Census of Agriculture, CBS, 2012)

<table>
<thead>
<tr>
<th>Machinery/Equipments used</th>
<th>No of Households</th>
<th>% Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron ploughs</td>
<td>1,073,441</td>
<td>28.02</td>
</tr>
<tr>
<td>Tractor &amp; Power tillers</td>
<td>920,371</td>
<td>24.03</td>
</tr>
<tr>
<td>Thresher</td>
<td>803,154</td>
<td>20.96</td>
</tr>
<tr>
<td>Pumping sets</td>
<td>548,203</td>
<td>14.31</td>
</tr>
<tr>
<td>Sprayers</td>
<td>574,014</td>
<td>14.98</td>
</tr>
<tr>
<td>Shallow tubewells</td>
<td>367,744</td>
<td>9.56</td>
</tr>
<tr>
<td>Deep tubewells</td>
<td>159,725</td>
<td>4.17</td>
</tr>
<tr>
<td>Treadle pump (Dhiki)</td>
<td>79,145</td>
<td>2.06</td>
</tr>
<tr>
<td>Animal drawn cart</td>
<td>334,978</td>
<td>8.74</td>
</tr>
<tr>
<td>Other Equipments</td>
<td>290,084</td>
<td>7.57</td>
</tr>
</tbody>
</table>
Gender-wise Farm Labour Involvement in Agricultural Operation in Terai

- Female
- Male

- Primary and Secondary Tillage
- Farm Yard manure Transportation
- Planting/ Sowing
- Fertilizer application
- Weeding
- Irrigation
- Plant Protection
- Harvesting
- Threshing
- Cleaning/ winnowing
- Transportation

Female
Male
Machinery supply chains

- Black smiths (75-85% supplier of hand tools)
- Small Agricultural Machinery Fabricators
- AM Industry (No due to unfavorable policy)
- AM importers
- Dealers/Sub dealers
- Service providers
  - Custum hiring
  - Repair and maintenance
- Farmers
AM Related Policy

- Past policies ignored mechanization due to fear of labor displacement
- Past policies such as Land Act (1964), National Civil Code (1853;1962) have encouraged land fragmentation
- Due to high demand for mechanization because of acute labor scarcity (peak season) and high cost of production, Government of Nepal has approved Agricultural Mechanization Promotion Policy 2014 in this month only.
Agricultural Mechanization Promotion Policy 2014

- Demand based
- During rigorous consultation with all stakeholders at all levels
- Salient Features
  - Focus on small holder farmers
  - Increasing competitiveness, modernising and commercializing Nepalese agriculture through appropriate mechanization
  - Development of supply chain in PPP approach
  - Environment, women and youth farmer friendly AM
  - Institutional development for promotion of SAM
Agricultural Mechanization Related Stakeholders

- Ministry of Agriculture Development
- Nepal Agriculture Research Council
- Department of Agriculture
- Education Institute
- Importers/ Traders (NAMEA)
- NGOs
- Manufacturers
- Service Providers
Challenges in Testing of Agricultural Machinery in Nepal.

- There is **low level of awareness** of the farmers & importers on the testing for standard, safe and quality agricultural machinery.
- There are **numerous hand tools and farm machines**.
- The performance of the hand tools and agricultural machinery **depend upon the user**
- Majority of hand tools and small agricultural machinery are **produced by the unorganized local artisans, small workshops** in the village level.
- Majority of village artisans and tiny industries use **scrap material** to produce hand tools, so the quality of hand tool produced vary from one piece to next moreover the tiny industries may **increase the cost** of tested hand tools and agricultural machinery.
- Poor **capacity and low level of technology adopted by the village artisans** in production of hand tools hinders the enforcement of quality hand tool production.
- Lack of legal framework in **standardization and testing** of agricultural hand tools in Nepal.
- Lack of **institutional setup & facilities** for the testing of agricultural machinery in Nepal.
Machinery Testing Centre

• No Testing Centre in the country
• AED, NARC performs field performance test and suggest the importer and farmers
• **New Agricultural Mechanization Promotion Policy- 2014** clearly emphasized on establishment of machinery testing and evaluation centre and promotion of safe and good quality machinery in agriculture
• Establishment of ANTAM will be beneficial for Nepal in all aspects.
Relevance of ANTAM in Nepal

• Help to import/ export safe and standard quality agricultural machines
• Strengthen the capability of National Institutes on testing of locally produced agricultural implements and machinery in regional standard
• Assure the farmers and all stake holders on the use of agriculture machinery of standard quality and help SAM in Nepal
Way Forward

Recently Approved Agricultural Mechanization Promotion Policy 2014 has clearly mentioned in its objective regarding promotion of standard quality and safe agricultural machinery in the country. To achieve the objective, following actions are envisaged:

- Endorsement of ANTAM standard and standard of neighbouring countries in the case of imported agricultural machinery.
- Preparation of test code and standard for locally produced agricultural machinery. (specially Injury prone agricultural machinery safety will be given top priority)
- Legal and institutional reform for standard, test and certification
- Preparation of national standard for important machinery
Way Forward........

– Establishment of agricultural machinery testing centre
– Information Campaign for awareness creation and information dissemination about the test standard, testing and certification of agricultural machinery to the farmers and entrepreneurs and traders/importers
– Mandatory testing for agricultural machinery imported, exported and that are provided subsidy as well as hazardous and injury prone agricultural machinery
– Voluntary test provision for other machinery
– Training the extension agents about the standard and safe agricultural machinery
– Develop credible standard, test and certification system for self evolving, participatory and sustainable system for the promotion of SAM in Nepal for the farmers of Nepal.
Thank You