NEPALESE AGRICULTURAL MECHANIZATION
POLICY AND STRATEGY

Presented by
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Ministry of Agricultural Development

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Now

Then
Nepal at a glance

- Total land area - 147,181 sq. km, Only 0.1% of total land mass of earth
- 77 districts, 263 Municipalities, 3157 VDCs
- Population 28.98 millions, 10 religions
- 125 caste/ethnic groups, 123 languages spoken as mother tongue
- Predominantly an agrarian country
- 25.2% people still below poverty line as of 2010
- Agriculture contributes 29.37% to GDP, 66% employment
- 21% of the land is cultivable (47% rain-fed)
- Average land holding – 0.68 ha
- Major crops Paddy, Maize, Wheat and Horticulture
- Livestock: Cattles, Buffaloes, Sheep/Goat, Pigs and Poultry
Major Weather

Climatic condition is strongly influenced by the monsoon circulation. On the basis of monsoon phenomena, there are four seasons in Nepal.

- Winter (Dec-Feb)
- Pre-monsoon (Mar-May)
- Monsoon (Jun-Sep)
- Post Monsoon (Oct-Nov)

- Country receives more than 80% of annual rainfall during summer monsoon
- Avg. Monsoonal day - 102 day
- Mean Annual rainfall - 1530 mm
- July is the wettest month (~26%)
- Nov. is the driest month (~0.6%)

Source: DoMH
## Irrigation Status - 2015/16

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Area in ha</th>
<th>Percentage Compared</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Area</td>
<td>14,718,100</td>
<td></td>
</tr>
<tr>
<td>Cultivable Area</td>
<td>2,641,000</td>
<td>17.94 of National Area</td>
</tr>
<tr>
<td>Irrigable Area</td>
<td>1,766,000</td>
<td>66.86 of Cultivable Area</td>
</tr>
<tr>
<td>Farmer Managed Irrigation</td>
<td>198,140</td>
<td>14.23 of Irrigated Area</td>
</tr>
<tr>
<td>Surface Irrigation</td>
<td>785,494</td>
<td>56.42 of Irrigated Area</td>
</tr>
<tr>
<td>Underground Irrigation</td>
<td>408,543</td>
<td>29.34 of Irrigated Area</td>
</tr>
<tr>
<td>Total Irrigated Area</td>
<td>1,392,177</td>
<td>78.83 of Irrigable Area</td>
</tr>
</tbody>
</table>

Source: Statistical Information on Nepalese Agriculture, 2072/73 (2015/16), MoAD
1921 - Agriculture Office established at Charkhal, Kathmandu.

1924 - Beginning of Modern AgrilMech after Mr. Krishna Bdr. Thapa of Biratnagar 1st. time imported single cylinder tractor.

1953 - Establishment of Agriculture Engineering Unit under Ministry of Agriculture Development. Importation of modern farm equipments started for government agriculture and livestock farm.

1959 - Agriculture Equipment Research Unit was established in Ranighat, Birgunj of Parsa for research and promotion of agricultural equipment for terai region- iron-made plough and rice thresher.

1964 - Agriculture Tool Factory (ATF), Birgunj was established former USSR- iron-made plough, pedal thresher, corn thresher, wheel barrow, wheat thresher, pump-set and tractor-trailer.

1970 - Food Technology and Quality Control department established a fruit processing pilot plant.

1971 - Janakpur Agriculture Development Project (JADP) by Japan Government (JICA) to promotion of deep tube-well, power-tiller and modern agriculture equipments.
Agricultural Mechanization Timeline

1973-1983 Agriculture Development Bank (ADB/N) started to prioritize the loan on tractors and pump-sets.

- Livestock Development Farm, Pokhara - German Technical Cooperation Agency (GTZ), use of Forage harvester, incubator

- Jiri farm, Dolakha - Swiss Government, use of some machineries

1991 - Agricultural Engineering Division (AED), NARC - testing and developing different agriculture machines and equipment

1996 - ATF privatized, now collapsed

2000 - Agricultural Engineering Bachelor - at IOE, Dharan-48 students/batch

2004 - Directorate of Agriculture Engineering (DoAEngg), DoA - agricultural mech. extension and training services


Agricultural Mechanization Promotion Operational Strategy (AMP_OS) - In approval Process
## Trend of Agricultural Mechanization 20 years

<table>
<thead>
<tr>
<th>Types of Equipments</th>
<th>1991/92</th>
<th></th>
<th>2001/02</th>
<th></th>
<th>2011/12</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Holdings using equipments (‘000)</td>
<td>No. of items (‘000)</td>
<td>Holdings using equipments (‘000)</td>
<td>No. of items (‘000)</td>
<td>Holdings using equipments (‘000)</td>
<td>No. of items (‘000)</td>
</tr>
<tr>
<td>Iron ploughs</td>
<td>315.1</td>
<td>354.5</td>
<td>870.3</td>
<td>890.2</td>
<td>1073.4</td>
<td>856.3</td>
</tr>
<tr>
<td>Power tillers</td>
<td>5.6</td>
<td>1.6</td>
<td>15.6</td>
<td>11.8</td>
<td>75.7</td>
<td>10.4</td>
</tr>
<tr>
<td>Shallow tube wells</td>
<td>50.9</td>
<td>48.2</td>
<td>119.7</td>
<td>109.5</td>
<td>367.7</td>
<td>262.0</td>
</tr>
<tr>
<td>Deep tube wells</td>
<td>20.1</td>
<td>15.7</td>
<td>58.6</td>
<td>51.5</td>
<td>159.7</td>
<td>82.0</td>
</tr>
<tr>
<td>Rower pumps</td>
<td>3.5</td>
<td>3.8</td>
<td>22.7</td>
<td>21.8</td>
<td>79.1</td>
<td>36.2</td>
</tr>
<tr>
<td>Tractors</td>
<td>35.2</td>
<td>5.5</td>
<td>272.9</td>
<td>150.6</td>
<td>844.7</td>
<td>37.4</td>
</tr>
<tr>
<td>Threshers</td>
<td>85.6</td>
<td>19.9</td>
<td>249.5</td>
<td>129.1</td>
<td>803.1</td>
<td>51.9</td>
</tr>
<tr>
<td>Pumping sets</td>
<td>81.1</td>
<td>41.3</td>
<td>210.4</td>
<td>146.1</td>
<td>548.2</td>
<td>150.3</td>
</tr>
<tr>
<td>Animal drawn cart</td>
<td>204.6</td>
<td>198.1</td>
<td>226.4</td>
<td>199.1</td>
<td>335.0</td>
<td>159.9</td>
</tr>
<tr>
<td>Sprayers</td>
<td>50.2</td>
<td>23.4</td>
<td>203.0</td>
<td>145.9</td>
<td>574.0</td>
<td>282.3</td>
</tr>
<tr>
<td>Others</td>
<td>296.5</td>
<td>878.4</td>
<td>449.0</td>
<td>1072.7</td>
<td>290.1</td>
<td>83.5</td>
</tr>
</tbody>
</table>

Source: National Sample Census of Agriculture, CBS
<table>
<thead>
<tr>
<th>HS Code</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Value in NPR '000</th>
<th>Source Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>870110</td>
<td>Tractor including Power Tiller</td>
<td>PCS</td>
<td>38,896</td>
<td>11,451,192</td>
<td>India, China</td>
</tr>
<tr>
<td>843210</td>
<td>Ploughs</td>
<td>PCS</td>
<td>18,946</td>
<td>20,386</td>
<td>India, China</td>
</tr>
<tr>
<td>843220</td>
<td>Disc harrows</td>
<td>PCS</td>
<td>4,595</td>
<td>35,125</td>
<td>India, UK</td>
</tr>
<tr>
<td>843229</td>
<td>Harrows (excl disc harrows), scarifiers, cultivators, weeders, hoes including Mini Tiller</td>
<td>PCS</td>
<td>221,151</td>
<td>1,070,647</td>
<td>India, China, Indonesia</td>
</tr>
<tr>
<td>843230</td>
<td>Seeders, planters and transplanters</td>
<td>PCS</td>
<td>2,763</td>
<td>20,042</td>
<td>India, China</td>
</tr>
<tr>
<td>843280</td>
<td>Soil preparation/cultivation machinery; lawn/sports-ground rollers</td>
<td>PCS</td>
<td>38,068</td>
<td>143,689</td>
<td>India, China</td>
</tr>
<tr>
<td>843320</td>
<td>Mowers (including cutter bars for tractor mounting)</td>
<td>PCS</td>
<td>1,129</td>
<td>26,899</td>
<td>India, China, Australia</td>
</tr>
<tr>
<td>843340</td>
<td>Straw or fodder balers (including pick-up balers)</td>
<td>PCS</td>
<td>677</td>
<td>9,095</td>
<td>India, China</td>
</tr>
<tr>
<td>843351</td>
<td>Combine harvester-threshers</td>
<td>PCS</td>
<td>1,930</td>
<td>353,761</td>
<td>India, China, Japan</td>
</tr>
<tr>
<td>843352</td>
<td>Threshing machinery for agricultural produce</td>
<td>PCS</td>
<td>21,933</td>
<td>654,189</td>
<td>India, China, New Zealand, Turkey</td>
</tr>
<tr>
<td>843353</td>
<td>Root or tuber harvesting machines</td>
<td>PCS</td>
<td>2,711</td>
<td>23,855</td>
<td>India, China</td>
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<tr>
<td>843359</td>
<td>Harvesting machinery</td>
<td>PCS</td>
<td>17,802</td>
<td>58,737</td>
<td>India, China, Japan</td>
</tr>
<tr>
<td>843610</td>
<td>Machinery for preparing animal feeding stuffs</td>
<td>PCS</td>
<td>176,638</td>
<td>697,678</td>
<td>India, China, Netherlands, Germany, Republic of Korea</td>
</tr>
<tr>
<td>843620</td>
<td>Poultry incubators and brooders</td>
<td>PCS</td>
<td>844,222</td>
<td>219,934</td>
<td>India, China, UK, Malaysia</td>
</tr>
<tr>
<td>843710</td>
<td>Machines for cleaning/sorting/grading seed grain or dried vegetables</td>
<td>PCS</td>
<td>10,666</td>
<td>508,893</td>
<td>India, China, Germany, Republic of Korea</td>
</tr>
</tbody>
</table>
Trend of Tractor/Power Tiller Registered

Source: Department of Transport Management
Sector wise Policies Related to Agriculture

more than 20 different policy

- Agriculture Biodiversity Policy 2063 (2006)
- National Tea Policy 2057 (2000)
- Dairy Development Policy 2064 (2007)
- National Fertilizer Policy 2058 (2001)
- Poultry Policy 2068 (2011)
Sector wise Policies Related to Agriculture

- Pasture Policy 2068 (2011)
- Floral Promotion Policy 2069 (2012)
- National Land Use Policy 2069 (2012)
- National Cooperatives Policy 2069 (2012)
- Commerce Policy 2065 (2008)
- Climate Change Policy 2067 (2010)
- Industrial Policy 2067 (2010)
- Supply Policy 2069 (2012)
- Science and Technology Policy 2069 (2012)
- Biotechnology Policy 2063 (2006.)
- Agricultural Mechanization Promotion Policy, 2071 (2014)


Article 51. State policies: Section (e) Policies regarding agriculture and land reform:

- Protecting and promoting rights and interests of peasants and utilizing the land use policy for increasing production and productivity of agriculture and for commercialization, industrialization, diversification and modernization of agriculture;

- Making arrangements for agricultural tools and an access to market with appropriate price for the produce.
Vision

Contribute to national development through modernization and commercialization in present agriculture system using agricultural mechanization

Mission

To contribute to sustainable economic development through the agricultural mechanization and agribusiness modernization

Goal

To research, develop, adopt, extend, and promote agricultural machines, implements & equipments to increase agricultural productivity and make it sustainable and competitive
4 Main Objectives

- To increase productivity through appropriate agricultural mechanization as per the economic and geographical need of the country in order to develop the sustainable, competitive and commercial agriculture sector.

- To develop the services and business of agriculture machineries through the coordination among the government, private sectors and cooperatives in order to increase the access of the farmers and the business people.

- To identification and promotion of women and environment friendly agriculture machineries.

- To establish and strengthen the organizational structural to develop, quality standardization, regulation, monitoring and promotion of agriculture machineries for agricultural mechanization.

Agricultural Mechanization Promotion Policy, 2071 (2014)

Approved on 29th August 2014

- 20-year strategic planning from 2015 to 2035
- Agricultural Mechanization as one of the thirteen outputs/core priorities

Vision

A self-reliant, sustainable, competitive, and inclusive agricultural sector that drives economic growth, and contributes to improved livelihoods and food and nutrition security leading to food sovereignty

ADS activities will have impact on three groups of farmers:

Commercial, Subsistence and Landless

Private sector is the major player to boost agricultural mechanization
Output section 2.10: it is clearly mentioned that:
Agricultural mechanization strategy focusing on

- Awareness creation
- Demand stimulation
- A concessionary financing arrangement
- Technical capacity building of the dealer network, particularly for the 2-wheel power tillers and mini-tiller dealers throughout the country
- Some modifications in taxation.

**There are 6 components to this strategy:**

<table>
<thead>
<tr>
<th>Components</th>
<th>ADS Proposal</th>
</tr>
</thead>
</table>
| Information dissemination                       | (a) Conduct social marketing campaigns on a cost sharing basis with 2-wheel tractor importers and dealers emphasizing the advantages of a 2-wheel tractor for the traditional forms of cultivation, harvesting etc.  
(b) Conduct three separate campaigns; viz., one each for the mountainous, hilly and terrain regions, with the aim of creating awareness to farmers of the potential options and choices. |
| Improve customer access to finance              | Promote commercial banks to finance dealers to on-lend to their customers under two options: (i). Extend credit on commercial terms to dealers (ii). Access cheaper credit from the Rastra Bank’s “deprived sector” lending program (cooperatives and micro-finance institutions). |
| Capacity building of service and maintenance providers | (a) Support dealers to increase the technical capacity of existing smaller workshops that are scattered through the countryside, rather than setting up their own repair workshops. These workshops could also stock spare parts and act as small brokers for around 30-35 dealers operating in major commercial centers.  
(b) Support dealers to offer technical training for 1,000 farmer/service providers to enable them to become local experts in the impacts of mechanization (additional germination rates, cost saving implications, the advantage of zero leveling, the impact of seed drills etc.) |
### Policies, Strategies for Agricultural Mechanization

#### Agricultural Development Strategy (ADS) (2015)

There are 6 components to this strategy:

<table>
<thead>
<tr>
<th>Components</th>
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</tr>
</thead>
</table>
| Enable the business environment for leasing agricultural equipment | (a) Provide legal clarification (ruling) that the Banking Institutions Act does not restrict nonbanking institutions to engage in leasing;  
(b) Establish a pledge registry (under the Secured Transactions Act or under by amendment to the Contracts Act) to allow securing the financing for leasing operations by leasing companies. |
| Revise regulation and taxes to support mechanization | (a) Waive the VAT amount and import duty on spare parts to reduce the proliferation of sub-standard spare parts brought illegally across the border and promote business of local dealers and sub dealers.  
(b) Remove the 5-year restriction on change of ownership of 2-wheel tractors, to encourage mechanization  
(c) Impose full VAT on the purchase of 4-wheelers but not on 2-wheelers. Most 4-wheel tractors are used exclusively for commercial transport rather than for agriculture.  
(d) Reduce the road tax for Power Tillers. Currently, the levy is US$28 for Tractors and US$22.3 for Power Tillers, which is clearly a disincentive for a Power Tiller buyer, if it is to be used solely for agriculture. |
| Pilot a voucher scheme | Entail provision of a 30% subsidy on all attachments for 2-wheelers and 4-wheelers, to increase the rate of attachment usage (seed drills, reapers, laser levelers, planters etc.). This would last just 3 years and be accompanied by the above mentioned social marketing campaign. |
Policies, Strategies for Agricultural Mechanization

Agricultural Mechanization Promotion Operational Strategy (AMP_OS) - under approval stage

- It is the guiding document with
  - Implementation plan
  - Cost-estimation
  - Institutional and regulatory framework

- Focused on
  “Sustainable Agricultural Mechanization for Food Security and Agricultural Commercialization”

- Overall purpose
  - To raise the level of mechanization for increased land and labour productivity
  - Adopting appropriate and sustainable agricultural mechanization technologies
Agricultural Mechanization Promotion Operational Strategy (AMP_OS) - under approval stage

- Strategic framework comprised of 4 interrelated elements
  1. Enhancing demand and use of appropriate agricultural machinery
  2. Improving supply situation giving priority to domestic fabrication
  3. Strengthening innovation system
  4. Providing appropriate policy, institutional and regulatory measures
Policies, Strategies for Agricultural Mechanization

Agricultural Mechanization Promotion Operational Strategy (AMP_OS)- under approval stage

- 6 components comprised of 4 interrelated elements

1. Enhance access to and use of agricultural machines and equipment at farm level
2. Domestic production and fabrication of feasible agricultural machines, movable parts and equipment
3. Innovation in agricultural mechanization
4. Improvement in business environment for the traders
5. Repair and maintenance facilities of agricultural machinery
6. Policy, Institutional reform and regulatory support
Private sector led agricultural mechanization with optimal regulation and facilitation from the part of the government

- identified 38 activities and 105 sub-activities within 6 components

<table>
<thead>
<tr>
<th>Component</th>
<th>Key target groups/ focus</th>
<th>Emphasis</th>
<th>No of Activities</th>
<th>No of sub-activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1</td>
<td>Farmers</td>
<td>Information dissemination, awareness raising, training and capacity enhancement, demonstration, exhibition and fair</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Component 2</td>
<td>Fabricators/ Manufacturers</td>
<td>Identification, development and capacity enhancement of public, cooperative and private enterprises, partnership and coalition building among education, research, extension and business/industry, financial and non-financial incentives to domestic fabricators/ producers, revitalization of Agricultural Tools Factory</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>Component 3</td>
<td>National Agriculture research and Extension system</td>
<td>Enhancing public sector research capacity, Participatory Technology development, AM design &amp; testing, Upgrading AED/NARC research, extension linkages</td>
<td>8</td>
<td>24</td>
</tr>
</tbody>
</table>
## Agricultural Mechanization Promotion Operational Strategy (AMP_OS)- under approval stage

<table>
<thead>
<tr>
<th>Component</th>
<th>Key target groups/ focus</th>
<th>Emphasis</th>
<th>No of Activities</th>
<th>No of sub-activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 4</td>
<td>Traders</td>
<td>Import and trade facilitation, reforms in tax and vehicle registration, monitoring the quality, standard and market price enhancing access to credit, after sale support.</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Component 5</td>
<td>Repair Mechanics</td>
<td>Repair and maintenance, Produce, train and assist village agricultural mechanics Workshops support, Ensure availability of spare parts at fair prices, Ensure availability of after sale support from traders and producers</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Component 6</td>
<td>Service Providers</td>
<td>Reorganization and upgrading of DoAEngg, policy and institutional interventions to support to improve access of farmers, fabricators and traders to credit and spare parts, Reforms in institutional and regulatory measures including AM Promotion Act</td>
<td>6</td>
<td>11</td>
</tr>
</tbody>
</table>
**Agricultural Mechanization Promotion Operational Strategy (AMP_OS) - under approval stage**

**Targets set for raising the level of Agricultural Mechanization**

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% of agricultural mechanization</td>
<td>40% (Terai-61%, Mid-hill 15%, mountains-2%)</td>
<td>50</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>Power use in Kw/Ha (Mechanical)</td>
<td>0.67</td>
<td>0.74</td>
<td>0.85</td>
<td>1.19</td>
</tr>
</tbody>
</table>

Source: AMP_OS study team report
Government of Nepal approved the law
Combine Harvester along with baler or Straw Chopper has to be imported for straw mgmt

Establishment of Testing Center
For Agricultural Engineering Division (AED)/NARC insisted by CIMMYT/USAID

Establishment of Training Center
For Directorate of Agricultural Engineering (DoAEngg)/MoAD insisted by CIMMYT/USAID

Establishment of Post Harvest Service Center
For safe storage and processing of seed

Establishment of Seed Bank
For earth quake district for safe storage with processing machine
Lessons Learned and Good Practices

✓ **Rural Livelihood Program**
  Training Blacksmiths, Operator, Mechanics

✓ **Establishment of Resource Center**
  For repair and maintenance of tools and machine

✓ **Training and Demonstration**
  PPP model- operation and demo of machines to farmers

✓ **Subsidy**
  Interest Subsidy for Machine Financing
  Capital Subsidy for Machine

✓ **Establishment of Custom Hiring Center**
  Model Custom Hiring Center has been developed
  Guideline Prepared – Under process of Approval

✓ **Disaster Recovery Work**
  Like in Earth Quake CIMMYT/ USAID- Distributing grain storage materials and Agril Machine in eight EQ affected districts
Suggestions for Regional Cooperation amongst Countries

- Share National Policy, Strategy, Guidelines
- Cooperation in National Policy and Strategy Formulation
- Identification and Sharing of innovative solutions for sustainable agricultural mechanization
- Identify potential areas/countries for assistance or regional cooperation
- Develop Sustainable Agricultural Mechanization Strategy (SAMS)
Thank You

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