Asian and Pacific Workshop on Whole-Process Mechanization of Potato Production

Status of Potato Production and Whole-Process Mechanization in Nepal

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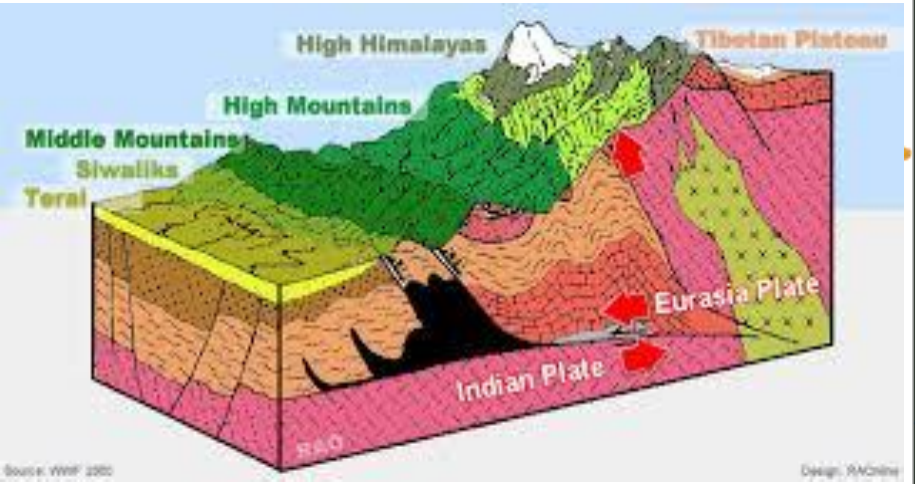
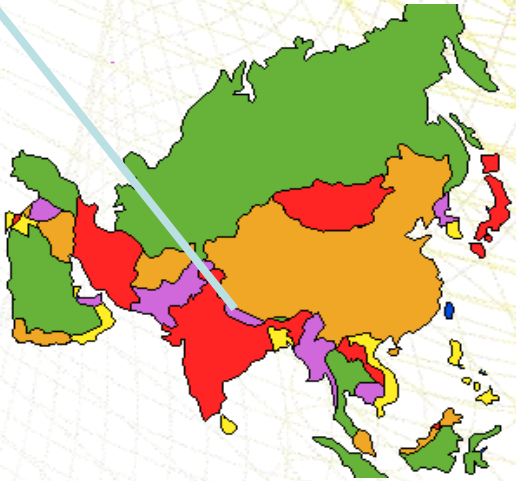
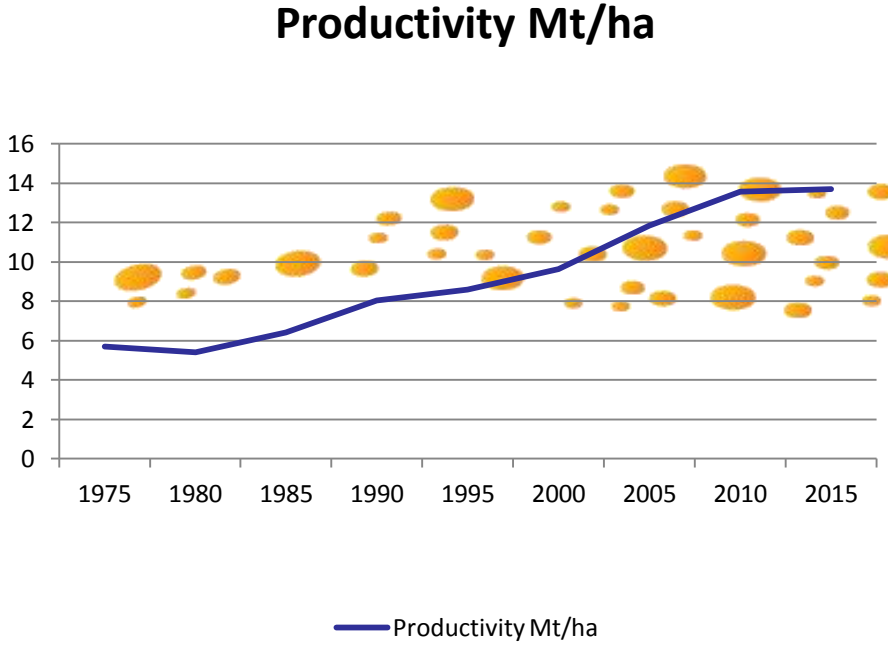
Federal Democratic Republic of Nepal

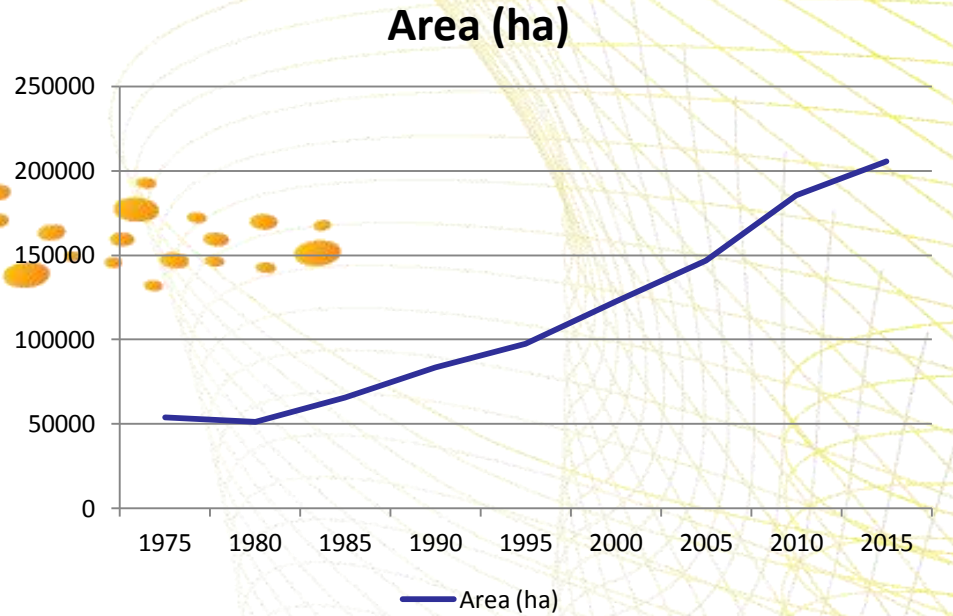




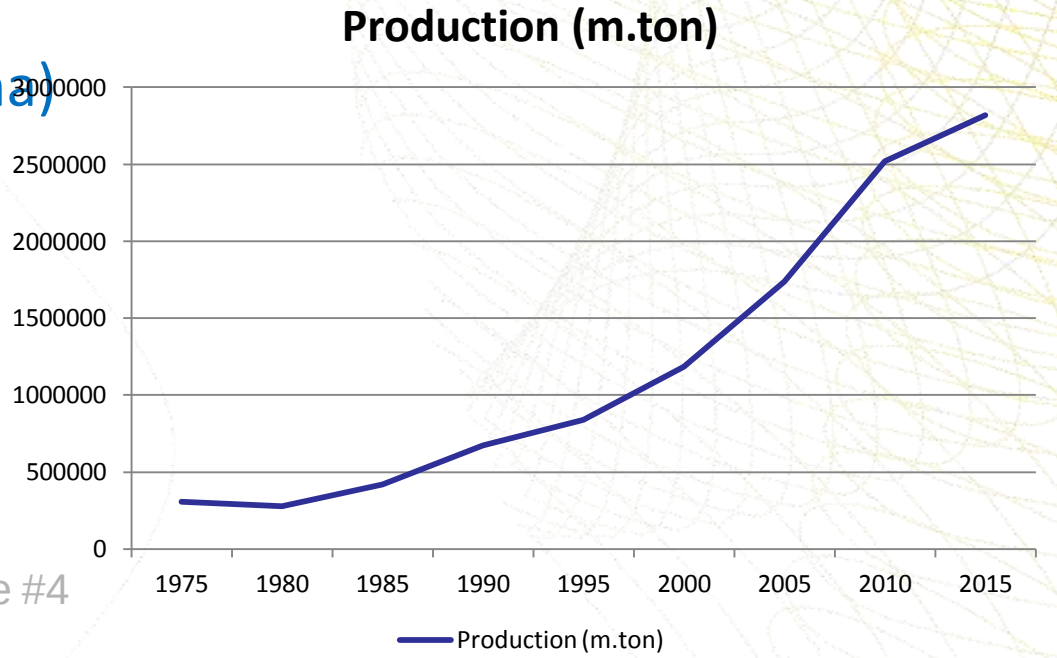
- Land area 147,181 sq km (EW-885 km, NS-193 km)
- Population 26.50 M (CBS, 2011)
- Three geographical region Terai, Hills & Mountains
- Elevation ranges from 70 to 8848 amsl (Mt. Everest)
- Climate temperate to sub tropical
- Rugged terrain and diversity (in all sense) the typical feature
- Potato Cultivation from 70 to 4400 amsl

Status of Potato Production (MoAD, 2016)





- 5th crop in area coverage (205,725 ha)
- Total production 2,817,512 mt
- Productivity 13.69 mt/ha
- Consumption 75 kgs/head/annum
- Almost self sufficiency for fresh consumption (88-90% around)



Potato Crop Varieties

- More than 10 varieties released and registered
- Distribution of different varieties in different geographical locations.
  - Western terai and hills- Cardinal, Desiree, Khumal white
  - Central and western Mid hills: Janakdev
  - Kaski and Nuwakot districts: MS 42.3
  - Hills of Dolakha, Sindhupalchok, Ramechhap districts: Rozita, Khumal red
  - Kavre, Bhaktapur and Kathmandu districts: Cardinal, Desiree, Janakdev
  - Eastern terai: Kufri Sindhuri, Cardinal

Season of Potato Growing differs with geographical locations

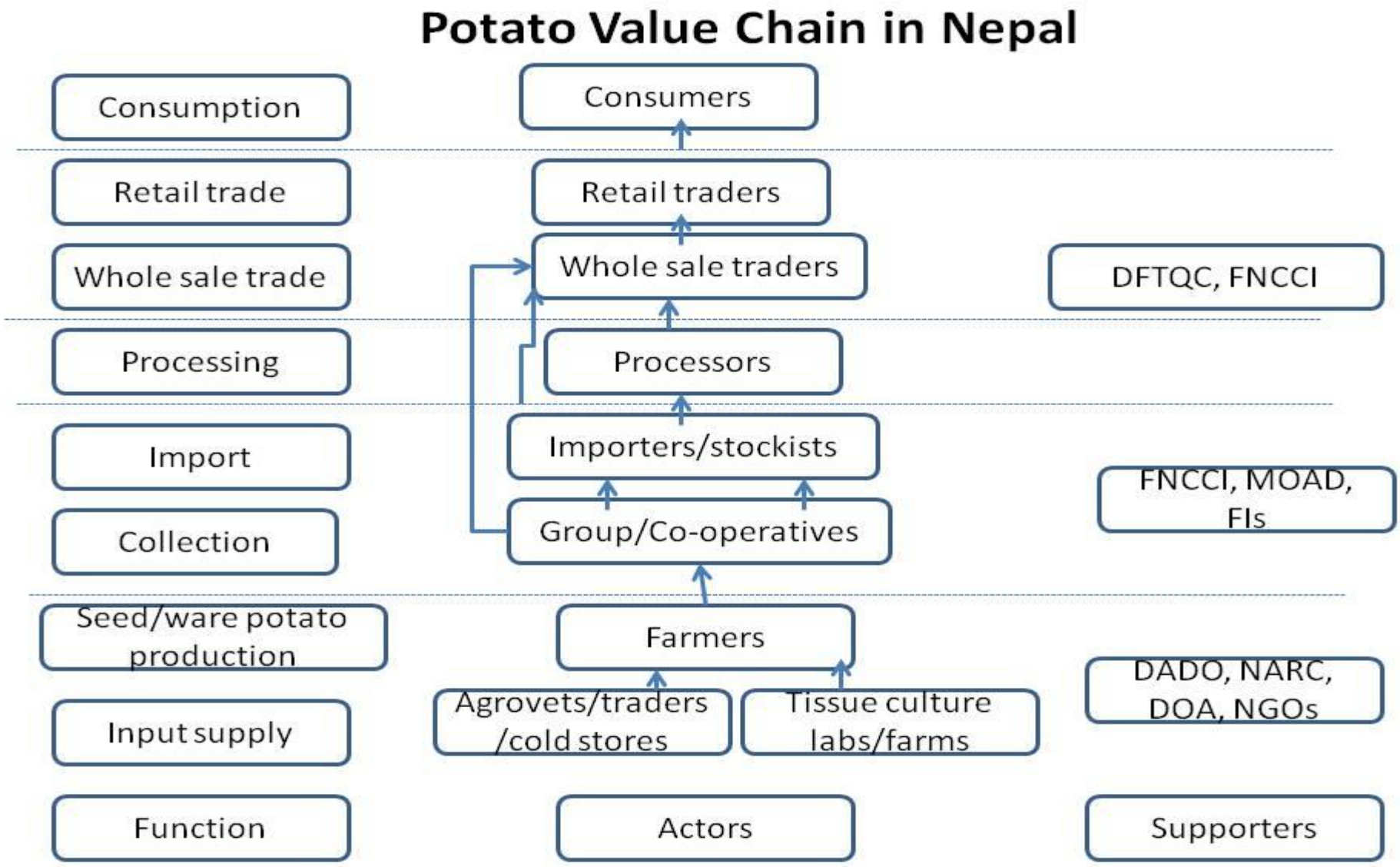
S.n	Season	Planting time	Harvesting time
1	Winter season	Sept-October	January-Feb
2	Early Spring	January-February	April-may
3	Late spring	March-April	June-August
4	Autumn season	July-August	September-October

Potato Trade

		Import		Export	
SN	Item	Kg	Values Rs	Kg	Values Rs
1	Potato seeds	141,180	2,419,479	300	6,000
2	Fresh potatoes				
	Potatoes fresh or chilled	215,034,005	4,140,642,487		
	Potatoes	3,402,117	74,945,545	13,300	133,000
	Total	218,436,122	4,215,588,032	13,300	133,000
3	Processed potato products				
	Flour, meal of powder of potatoes	24,900	1,475,408	18,730	2,383,363
	Flakes, granules, pellets of potatoes	451,079	31,116,829		
	Potato starch	802	42,125		
	Potato chips	162,417	88,964,349	34,255	86,349
	Potatoes prepared or preserved otherwise than by vinegar of acetic acid frozen	160,308	17,064,931		
	Total	799,506	138,663,642	52,985	2,469,712

Source: MoAD, 2013-14 (NRs 106 = 1$)

Overview of Potato Supply Chain



Gaps and interventions need

- **Increasing productivity**
- **Use of inputs**
  - **Irrigation**
  - **Chemical fertilizer**
  - **Quality seed**
  - **Mechanization**
- **Storage and marketing facilitation**
- **Trade (Import)**
- **Climate Change Adaptation**

Status of Mechanization in Potato Production

General Agricultural Mechanization

Households Using Various Machinery/Equipment for the Agricultural Operations

Machinery/Equipments used	No of Households	% Households
Iron ploughs	1,073,441	28.02
Tractor & Power tillers	920,371	24.03
Thresher	803,154	20.96
Pumping sets	548,203	14.31
Sprayers	574,014	14.98
Shallow tubewells	367,744	9.56
Deep tubewells	159,725	4.17
Treadle pump (Dhiki)	79,145	2.06
Animal drawn cart	334,978	8.74
Other Equipments	290,084	7.57

Source: National Sample Census of Agriculture, CBS, 2012

- **Agricultural Mechanization Promotion Policy,2014, Drafting of Strategy in process**
- **Agricultural Development Strategy (ADS), 2015, Special section mentioning private sector involvement**
- **New Constitution of Nepal, 2015 (2072), emphasis for promotion of machinery**
- **Nepal Agricultural Machinery Entrepreneurs Association (NAMEA) officially registered**

Mechanization in Potato Production

Operation	Activities
Seed production	4 tissue culture labs (1 in government sector and 3 in private sector); 2 under construction, 6 screen/net house linked for pre-basic seed production. 4 labs proposed for next year in 50% cost bearing basis
Land Preparation	Almost 75 % is mechanized, 4 wheel tractor driven plough, mold board plough, disc harrow, ridger and cultivator in terai and 2 wheel power tillers and mini tillers driven rotavator, ridger in hills and mountains. Local manufacturers fabricated 2 wheel power tiller drawn ridger.
Seeding/ Sowing	Few 4 wheel tractor and 2 wheeler driven potato planter are been used and demand is increasing

Mechanization in Potato Production

Operation	Activities
Water Management	Electrical, diesel, petrol and some places solar pumps for water lifting. Drip irrigation system and use of sprinklers are increasing in hilly terrain
Intercultural Operation	Weeding: mostly manually, some hand tools weeder and mechanical weeder are coming in to practice. Pest management: different sprayers & dusters, it is almost 100%.
Harvesting	Mostly manually, some 4 wheel and 2 wheel tractor driven diggers are in practice in terai area. Local manufacturers started fabricating such attachments.
Post Harvest	Grading and shorting: manually. Manually operated potato grader has been introduced recently.

Mechanization in Potato Production

Operation	Activities
Transportation	Transportation from farm/field to collection center or storage is done manually in mountains, by bullock drawn carts and trucks, trailer attached to 4 wheel and 2 wheel tractors in terai and foot hills.
Processing	At least 34 processing factories are producing finger chips, chips and other products
Storage	• 40 Cold stores are in operation with estimated capacity of 86,400 mt, 50 % of the electricity tariff is being subsidized. • High altitude areas 10-40 Mt capacity, 171 rustic stores (Natural) with the estimated capacity of 1,710 mt are in proper operation. • Government has launched interest subsidy for 5 years for new cold store establishment finance by banks and free in minimum electricity demand charge

Need Assessment

- Commercialization of potato sector / Increased cost of production due to labor shortage
- Demand of good quality virus-free seed potato production
- Adequate infrastructure for good quality seed potato storage
- Demand of Machinery is increasing
- Establish well equipped training and testing center and TOT in machinery
- Educate sufficient mid-level technician for effective mechanization.
- Human resource development for entrepreneurs and cooperatives for custom hiring service.
- Attract young generation with Agricultural Mechanization as prestigious occupation to address agriculture human resources migration.

Challenges and Constraints

- The geographical setting.
- The land fragmentation is increasing.
- Low investment from public and private sector for the mechanization
- Limited access to machineries, spare parts and after-sales services.
- Weak organization setup in the government system. Only 15 agricultural engineer in DoA and 25 in NARC.
- Establishing training and testing center requires huge investment.
- No mid-level manpower production in the country for Agril Engineering.
- Energy supply
- Youth migration to urban and aboard leaving old age and women.
- Credit facility and high interest rates from financial institutions

Suggestions for Regional Co-operation

- Developed countries support to undeveloped/ developing countries through scholarship provisions for Capacity enhancement to existing human resources
- Exchange of new innovations on Agril Mechanization among the member countries of CSAM through strengthen linkages.
- Coordination among the organization/institute involve in Agricultural Mechanization in the SAARC regions.
- Establishment supports for Training and Testing Center.
- Strengthen and expand ANTAM activates throughout the region.
- A regional project for farm machinery research and development, technology generation and validation.

Suggestions for Regional Co-operation

- A regional project to support farmers financially and technically to mechanize their potato farming.
- A regional network of traders to increase access to machineries & spare parts
- Establishing regional database in agricultural mechanization
- Regional collaboration in organizing International Expos.
- CSAM continue organizing regional meeting and seminar for coordination and cooperation in area of Agricultural Mechanization.
- Establish network and linkages among agencies and individuals involved in whole-process mechanization of potato production in member countries

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Thanks for
your kind
attention