

Potential Demand and Current Limitations to Agricultural Mechanization

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1.1 Agricultural Mechanization lies at the interface of agriculture and industry. While it has to provide input to agricultural sector in terms of improved tools & equipment, it receives manufacturing technology from industry sector to produce such tools & equipment, and also helps enhance industrial activities in the country. Hence, it is affected by two demand variables.

When agriculture sector develops, it creates demand or so to say "Pull" for Improved Agricultural Machinery (IAM).

Similarly, when industry sector develops in a country, the demand of labour in this sector is provided by none other than agriculture sector. This creates "Push" resulting in the creation of vacuum in the agriculture sector. This vacuum of labour has to be filled up by the application of appropriate IAM.

- 1.2 There is a misnomer among policy planners that agricultural mechanization conflicts with labour employment. Many tend to take agricultural mechanisation as tractorisation only. However, the mechanisation extends much beyond tractorisation. Seeding, Fertilizing, Water Application and Post Harvest Technologies equally require mechanisation. A case in point is the traditional water mill in rural hilly areas which operates at a very low efficiency. Similarly, rural oil expeller and traditional rice mills could be made more efficient with little extra technological inputs.

Current Situation

- Labour shortage - Especially to Medium & Large farmers
- Tractor - 80 %
- Wheat Thresher - 60 % (Even in KTM)
- Combine Harvester
- Power Tiller

- Cost Comparison Between Bullock Ploughing and Mechanical Ploughing by Power Tiller

- Annex I Assumption



Bullock Ploughing

Mechanical Ploughing

- | | | |
|---------------------------------------|-------------------|----|
| ■ 1. Cost of average size bullock | = Rs. 30,000/pair | 1. |
| Cost of power tiller with rotovator | = 95,000 | |
| ■ 2. Wage rate of ploughing labour | = Rs. 1500/month | 2. |
| Fuel consumption | = 1.5 lit/hr | |
| ■ 3. Cost of food of ploughing labour | = Rs. 1000/month | 3. |
| Ploughing capacity | = 0.7 | |
| bigha/hr | | |
| ■ 4. Cost of feed of bullock | = Rs. 1800/month | |
| 4. Operation hour | = 500 | |
| hr/yr | | |

- 5. Soil Pulverisation Factor (SPF) = 0.5 (6"/3") = 5.
Salvage Value = 10 %

- 6. Land ploughed = 0.35 bigha/day
6. Useful life = 10 yrs

- 7. Wage rate of operator =
Rs. 1500/month

- Rs/day

Rs/hr

■ 1. Interest @ 14 % on cost of bullock =	12	1.
Depreciation - 10 %	- 17	
■ 2. Wage of ploughing labour =	50	2.
Interest @ 14 %	- 27	

■ 3. Cost of food of ploughing labour	=	33	3.
Fuel consumption @ Rs. 27/lit -		40	
■ 4. Cost of feed of bullock	=	60	
4. Repair & maintenance - 5 % -		10	
■			
■ 5. Wage of operator	-	6	
■ Cost Rs/day = 155			Cost per
hour 100			
■ Cost after adjusting SPF (Rs/day)	=	310	
■ Cost per bigha	=	885	
Cost per bigha	=	14	

- Hence, bullock ploughing is six times more expensive than mechanical ploughing.

Demand of IAM

	<u>Annual Demand (nos.)</u>
■ <u>Machines</u>	
■ Tractor	2500
■ Powertiller (two-wheel tractor)	1500
■ Pumpset	4000 - 6000
■ Power Driven Disc Harrow	80 - 100
■ Power Driven Cultivator	1000
■ Power Wheat Thresher	400
■ Power Paddy Thresher	150
■ Multicrop Thresher	100
■ Manual Rice Trans Planter	33000
■ Bullock Drawn Plough	3000
■ Hand Tools	10000 MT.

Cost Comparison of IAM between Nepal & India

Assumption:

Index

1) Average Wage in Nepal		- NRs. 2500	100	
2) Average Wage in India		- IRs. 2500	160	
3) Index of Cost of Machine in India	-			100
4) Index of Cost of Machine in Nepal	-			109
Transportation		- 5 %		
Clearing, Handling, etc	- 4 %			
				9 %
5) Index of Cost of Raw Material in India	-		100	
Index of Cost of Raw Material in Nepal	-		145	
Transportation		- 5 %		
Average Custom & VAT	- 40 %			
				45 %
6) Labour productivity in Nepal due to batch type production	-	100		
Labour productivity in India due to scale of operation	-	125		
7) Structure of Cost Component in India & Nepal is same				

Cost Calculation

Weighted Component	% Share	of India	Cost Index	Average	Weighted of Nepal	Cost Index	Average	Weighted
Material	75	109	100		75	75		145
Labour	18	18	160		23 ^[1]	23		100
Machine	7	8	100		6 ^[2]	6		109
	100 %			104				135

Hence, average cost of production in Nepal is about 30 % (135 ÷ 104) higher than in India.

[1] $(18 \times 160) \div 100 \div 125$ (Labour Productivity Factor) = 23

7 Higher labour productivity also increases machine productivity although at a lesser rate. This rate is estimated at 15 %.
Hence this figure is also calculated as $(7 \times 100) \div 100 \div 115 = 6$

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Conclusion:

- Custom Duty
- Registration of PT
- Easy Loan
- R & D & Extension