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The 6th Regional Forum
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- Enabling Environment for the Private Sector
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A Case Study of Agricultural Machinery Business Firms ACI Motors on Rice Transplanting and Harvesting, *BANGLADESH*

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Govt. Subsidies for Agri-Machinery

- 30 to 70% price subsidy/Development Assistance for marginal farmers (highest for *Haor* area farmers)
- Applicable for 7 types of machinery including- reaper, combined harvester, & rice transplanter.
- National level technical committee selects companies eligible to supply machinery.
- Priority lists of farmers or groups prepared at upazila level and allocations disbursed accordingly.

Subsidy/Development Assistance

Mini Combine Harvester

Rice Transplanter

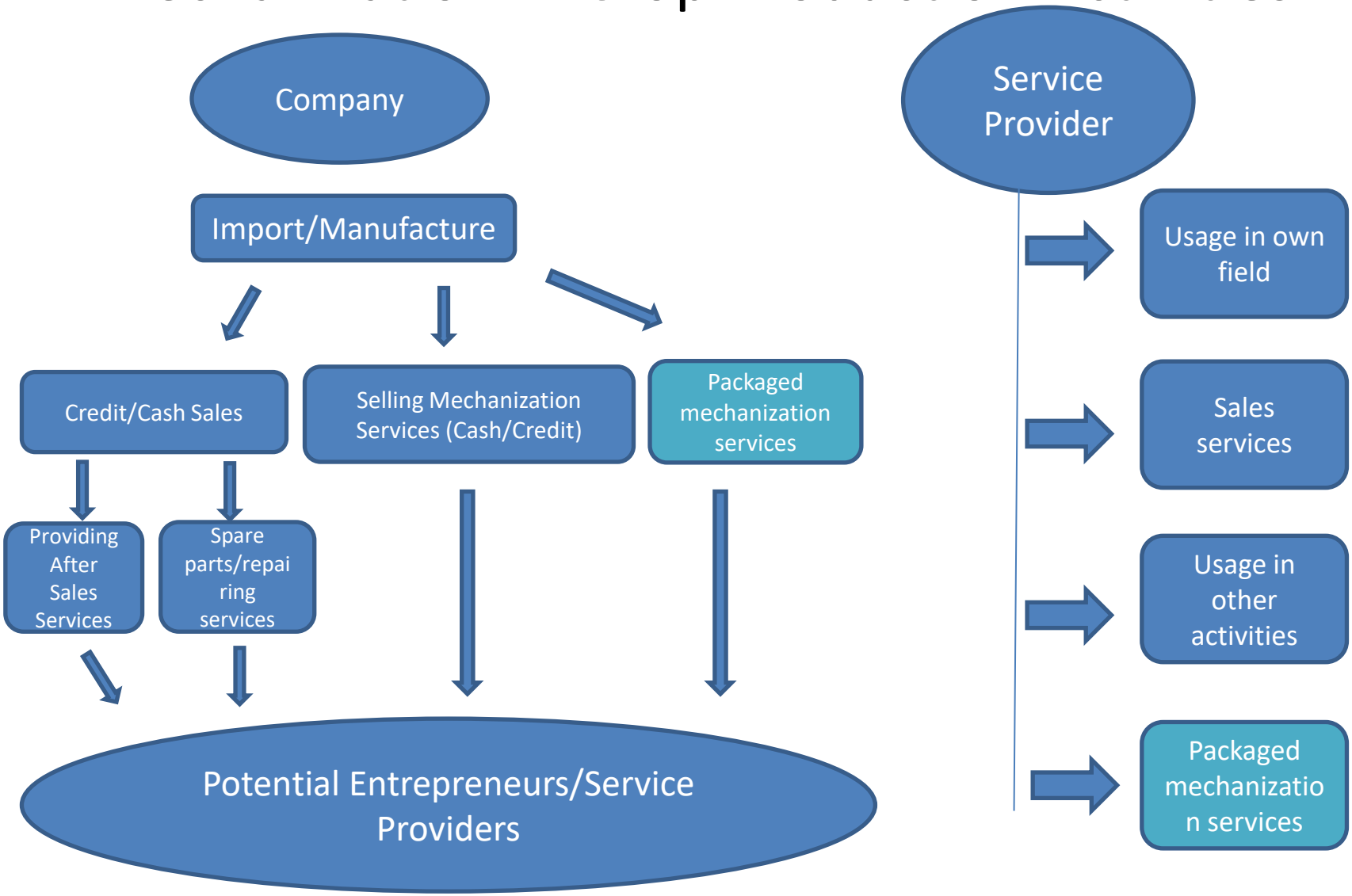
Reaper (Rice & Wheat)

Power Thresher

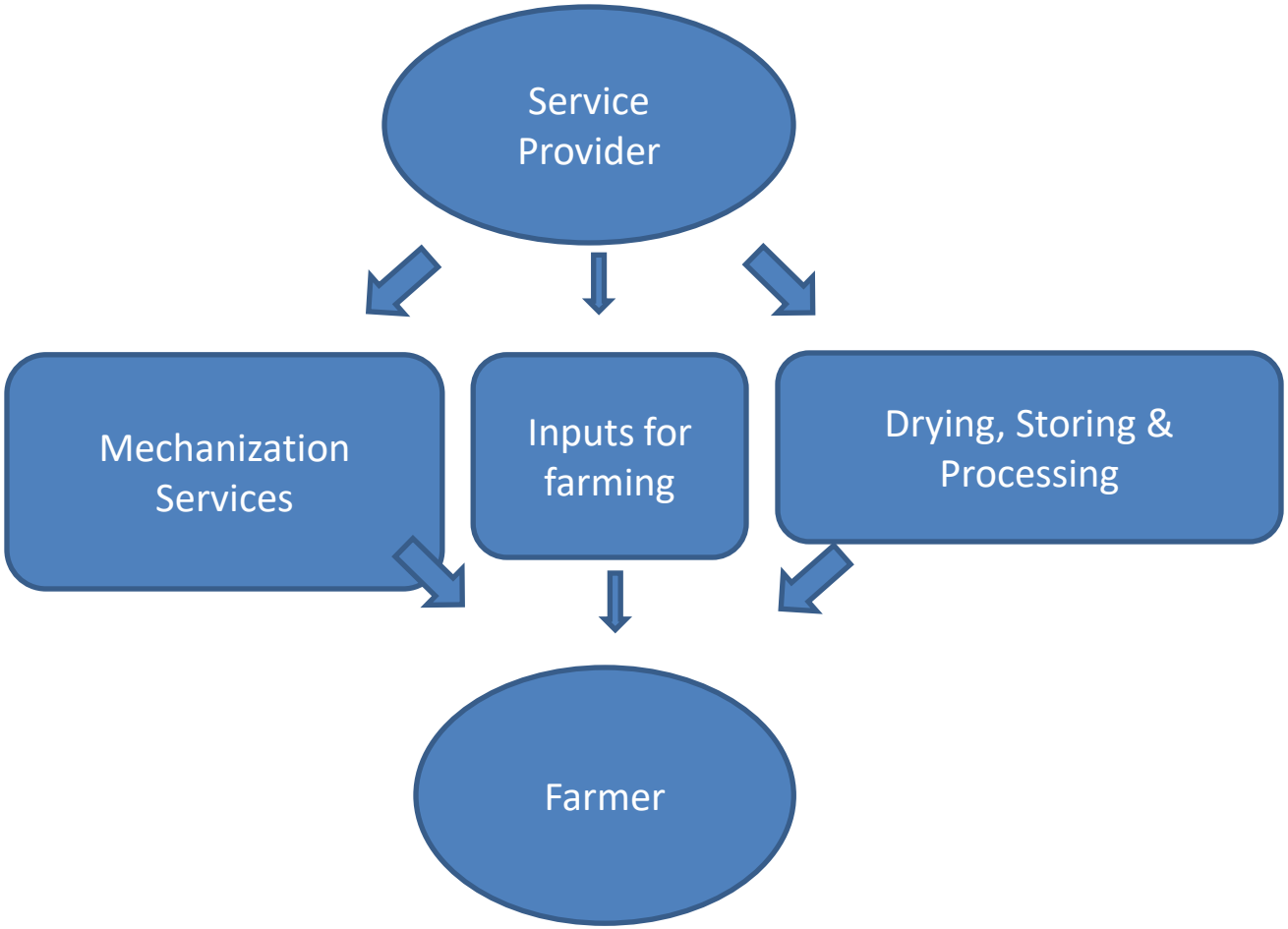
Pawer Tiller Operated Seeder

Foot pump

Business Model for Sustainable Mechanization in Crop Production Activities



Business Model for Packaged Mechanization Services



Business Model for Packaged Mechanization Services

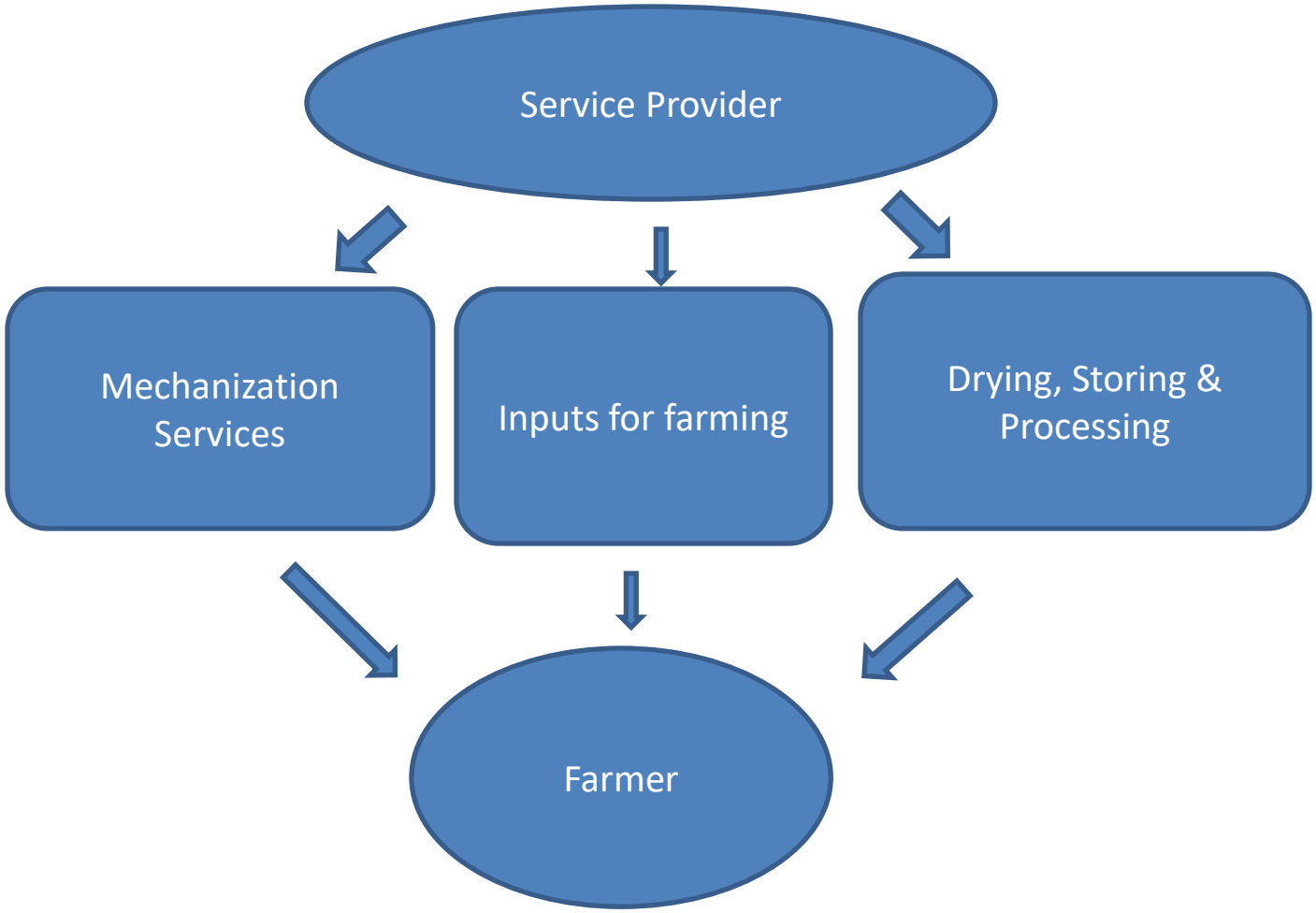
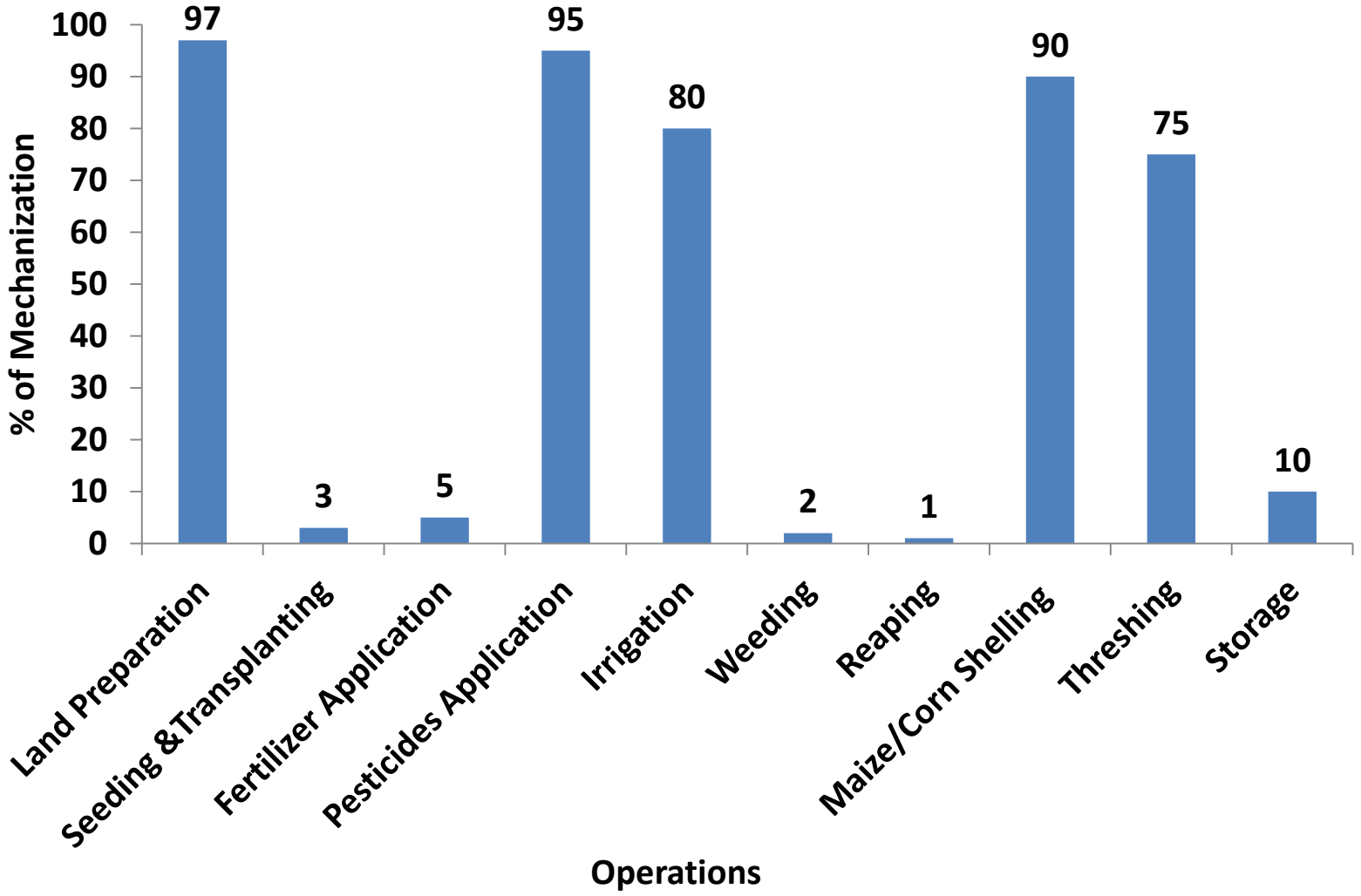


Fig. 01: Complete Farm Mechanization Solution

STATUS OF AGRI-MECHANIZATION



Status of Rice Transplanting in Bangladesh

1. Out of 5.50 million hectares of irrigated crop area about 4.62 million hectares are covered by manual transplanting (BBS, 2018).
2. However, manual transplanting of rice seedlings is expensive because of higher labour requirement (300-350 man-hrs/ha) and drudgery.
3. Gradual industrialization and migration of rural worker to urban areas causing a shortage of farm worker as a result hike of wage of workers in transplanting time.
4. Mechanical transplanting has been considered the most promising option as it saves labor, ensures timely transplanting and attains optimum plant density that contributes to higher productivity.

Table 01: Cost Comparison between Manual Transplanting and Mechanical Transplanting

Manual Transplanting Cost per hectare		**Mechanical Transplanting Cost per hectare)**	
Activity	**Cost in BDT**	**Activity**	**Cost in BDT**
Seed (100 kg @100 BDT/kg)	10000.00	Seed (100 kg @100 BDT/kg)	10000.00
Land Preparation for seedling raising (single pass by PT)	1200.00	Land Preparation for seedling raising	2550.00
Land preparation (3-4 pass by PT or 2 Pass by Tractor)	4800.00	Land preparation (2 pass by PT or 1 Pass by Tractor)	2400.00
Labour cost (Seedlings uprooting to transplanting) (50 Labor required 8 hrs@500.00)	25000.00	Transplanting Fuel-600.00; Operator-750.00; Labor-500.00; Depreciation-200.00	2050.00
Total	41000.00	Total	17000.00

- Manual transplanting total cost/ha BDT 41,000.00 (Fig. 03),
- Mechanical transplanting total cost/ha BDT17,000.00 (Fig. 04) (1USD = BDT 82).
- Cost Saving: 58%
- Time Saving: 75% and
- Labor Saving: 90%.
- Mechanical transplanting 100 kg (rice) more production over traditional transplanting.

Fig. 03: Manual Uprooting Seedlings and Manual transplanting System

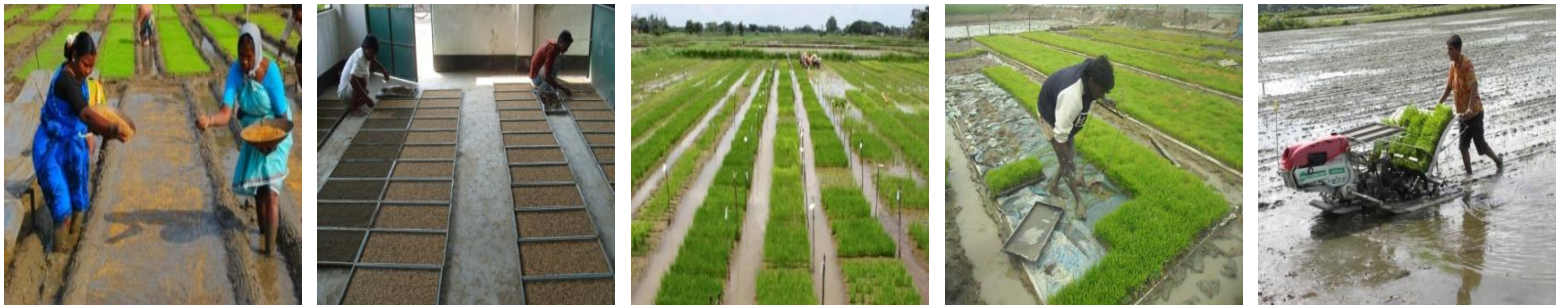


Fig. 04: Manual Seedling Raising Technique and Mechanical Transplanting system

Table 02: Cost Comparison between Manual Harvesting and Mechanical Harvesting

Manual Harvesting Cost per hectare		**Mechanical Harvesting Cost per hectare**	
Activity	**Cost in BDT**	**Activity**	**Cost in BDT**
Labour cost (25 Labor required @500.00) (200 man-hr, ha^{-1})	12500.00	Fuel- 2100.00 (30 Lit @ BDT. 70) Operator- 1 1800.00 Labor - 1 900.00 (300.00+150.00) per hr(total 6 hr). Depreciation- 400.00 Maintenance & others: 300.00	5500.00
Total	**12500.00**	**Total**	**5500.00**

- Manual harvesting total cost/ha BDT 12,500.00
- Mechanical harvesting total cost/ha BDT 5,500.00
- Cost Saving: 56% and
- Labor Saving: 92%.

Fig. 05: Manual Harvesting System

Fig. 06: Mechanical Harvesting system

Cost Saved

1. Considering 500 mechanical harvester and capacity of each combine harvester is 160 ha per year
2. Total saving by using 500 (five hundred) mechanical harvester per year is 560.00 million BDT over manual harvesting.
3. Area coverage by 500 combine harvester 80,000 ha per year and it only 1% of the total cultivable land of Bangladesh.
4. As per mechanization roadmap, the targets of mechanical transplanting are 20%, 40% and 80% by 2021, 2031 and 2041 respectively And
5. Targets of mechanical harvesting are 30%, 60% and 80% by 2021, 2031 and 2041 respectively (MoA, 2016).

Challenges

The major problems faced during the study on rice mechanical transplanting and harvesting are:

1. Farmers do not know the proper way of seedling raising technique.
2. Farmers have insufficient knowledge about new agricultural technologies as well as advanced technologies available in the country.
3. The farmers are reluctant to adapt new technologies as they thought that modern technologies won't bring any major changes in the agriculture sector.
4. High cost of the modern machines.

Future Plan

1. Special agricultural subsidy program to be continued for small and marginal farmers and potential entrepreneurs.
2. Educate farmers about the benefits of transplanter and harvester.
3. Formation of beneficiary groups for seedling raising technique.
4. Training on operation, repair & maintenance and seedling raising technique and after sales service for repair and maintenance to be provided at least for 2-3 years.
5. Establish sustainable market by providing training on transplanter and harvester.
6. Government of Bangladesh may encourage the private sectors to invest in seedling raising technique, transplanting and harvesting machinery.

THANK YOU…