

Trend of Agricultural Machinery and Spare Parts Manufacturing and Sales in Bangladesh

Md. Monjurul Alam, PhD

Professor, Bangladesh Agricultural University, Bangladesh



Agricultural Mechanization in Bangladesh - The Future
March 21-22, 2022



USAID
FROM THE AMERICAN PEOPLE



Collaborative Research on Sustainable Intensification



Post-Harvest Loss Reduction

KANSAS STATE UNIVERSITY



ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



ACI Motors



Content



- Historical background of agricultural mechanization
- Present status of agricultural mechanization
- Trend of agricultural machinery and spare parts market
- Strategies for promoting manufacturing industry
- Recommendations

Historical Background of Agricultural Mechanization



MCPPI scheme during 1950-51	First known attempt of using machines in agriculture
During Green Revolution in 1960s	Government distributed 2,238 power pumps, 200 tractors, 13,828 sprayers and dusters Established two workshops to facilitate repair and maintenance
Cyclone in 1970 and during Liberation war in 1971	Huge loss of livestock
1 st Five years Plan	162 tractors and 562 power tillers distributed in coastal & border areas BADC started irrigation services by DTW, STW and LLP
Bangabandhu Sheikh Mujibor Rahman, February 13, 1973	Called for technological innovation & modern practices in agriculture at BAU Elevated status of Agriculturists
Devastating flood in 1988	Heavy loss of livestock Exemption of tax on imported machines Waived standardization certification End monopoly of public sector importing
In 1990s	Imported power tiller, small engine, motor and spare parts made significant impact on agricultural mechanization
Govt. subsidy program (2020-25)	Implementing a subsidy program worth USD 360 million on agricultural machinery in next 5 years

Present Status of Agricultural Mechanization



Status of Agricultural Machinery and Installed Power

Agricultural Machinery	Number	Number/'000 ha	Available Power (kW/ha)
Tractor	60000	7.00	3.04
Power Tiller	700000	81.61	
Pump (DTW)	38000	4.43	
Pump (STW)	1575136	183.65	
Pump (LLP)	300613	35.05	
Solar irrigation pumps	5500	0.64	
High Speed Rotary Tiller	12000	1.40	
Power tiller operated seeder	7500	0.87	
Bed Planter	2500	0.29	
Rice Transplanter	754	0.09	
Reaper	4000	0.47	
Mini Combine Harvester	1200	0.14	
Medium combine harvester	1820	0.21	
Closed Drum Thresher	220000	25.65	
Open Drum Thresher	150000	17.49	
Corn Sheller	44000	5.13	
Sugarcane Crusher	50000	5.83	
Winnower	3000	0.35	

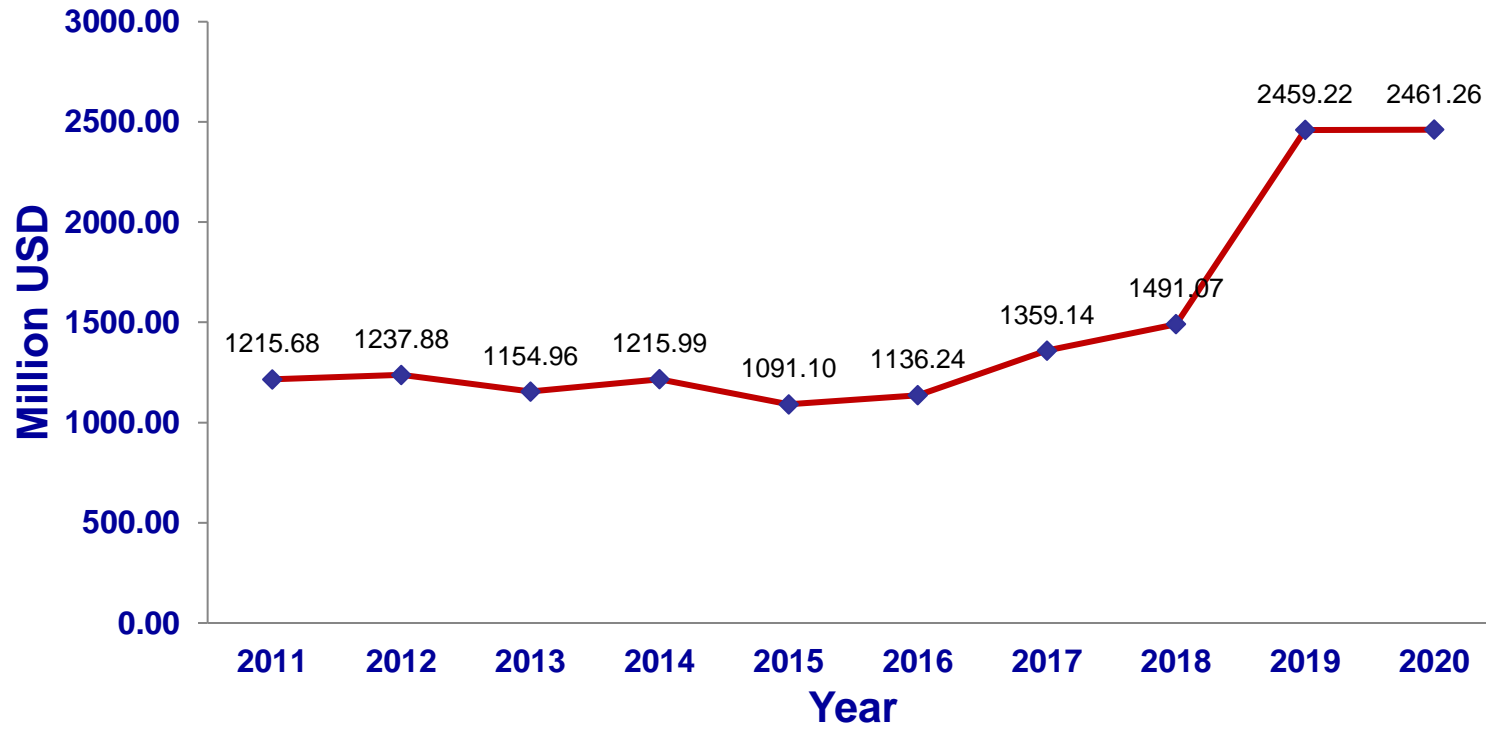
Power available (kW/ha): Japan: 8.75, China: 5.7; India: 2.22 (2015)

Status of Agricultural Mechanization

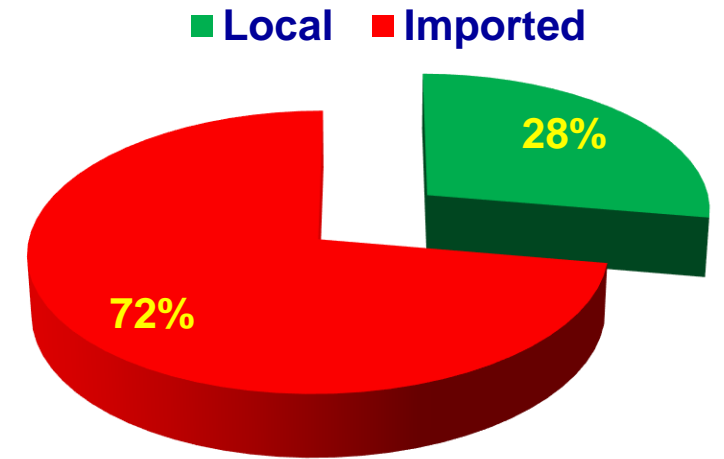
Activity	% Mechanized
Cultivation	95
Irrigation	95
Transplanting	<1
Fertilizer application	1
Weeding	65
Insecticide application	80
Harvesting	8
Threshing	78
Winnowing	6
Drying	2
Storing	4

Source: Alam, M. M. (2021)

Trend of Agricultural Machinery Market



Trend of Agricultural Machinery Market

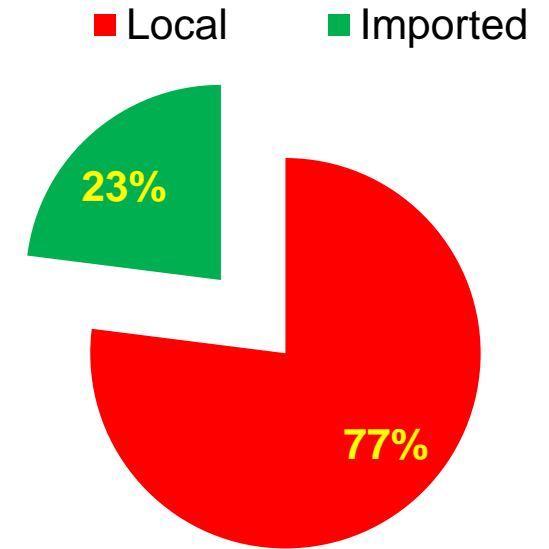
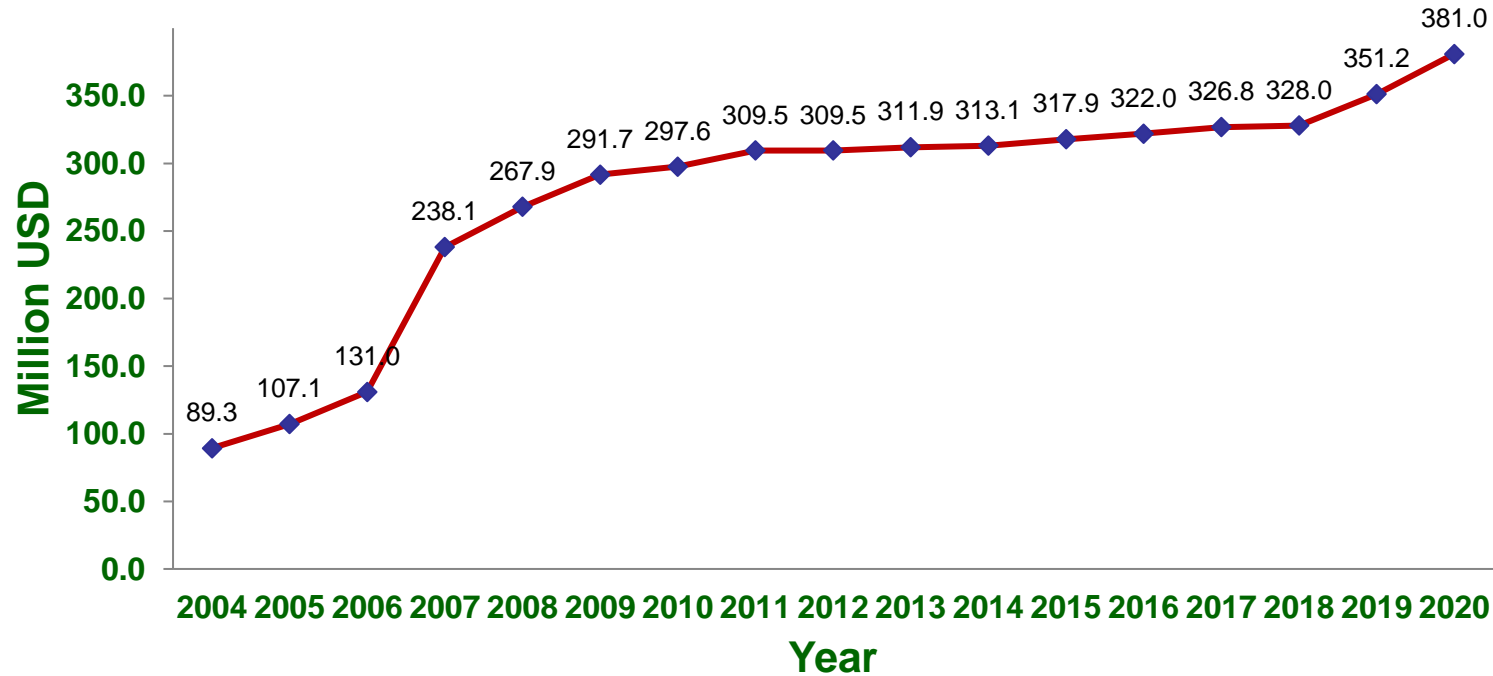


Agricultural Machinery Market



Machinery manufacturer: 800
 R&M Workshop: 20000
 Mechanic: 500000

Trend of Agricultural Spare Parts Market



Trend of Agricultural Spare Parts Market

Spare Parts Market



Foundry: 70
 Spare Parts manufacturer: 1500
 Retailer: 40000

Quality and Price of Spare Parts



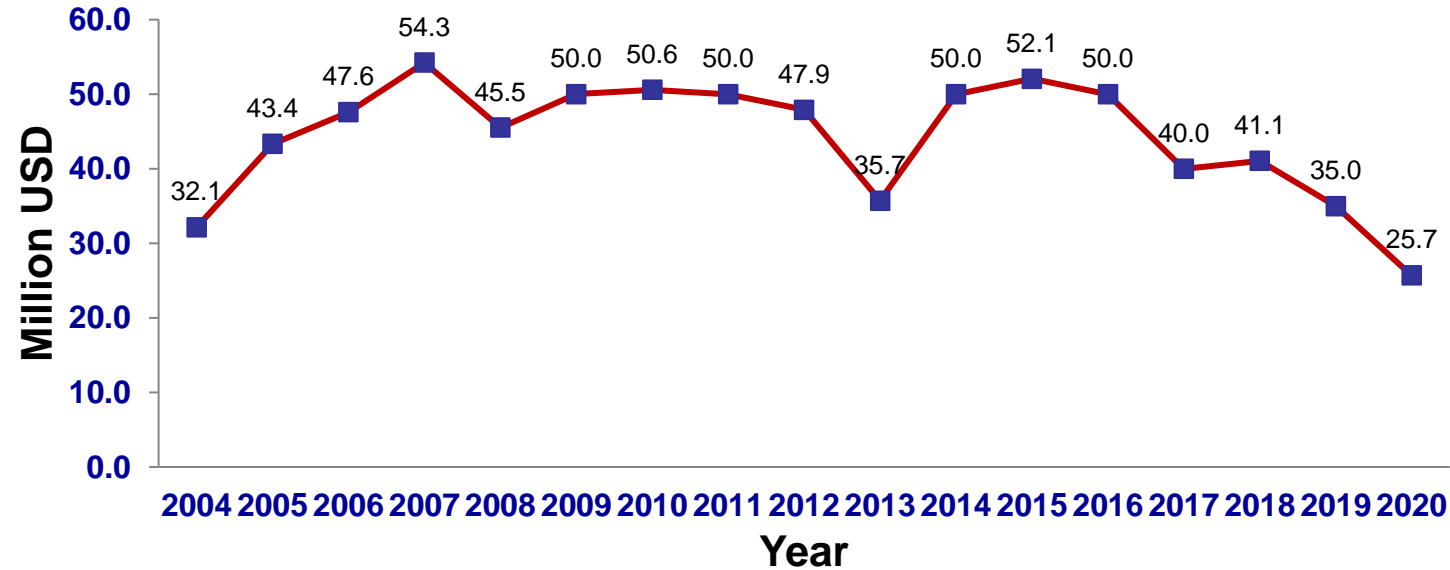
Spare parts	Local spare parts		Imported spare parts		
	Quality	Price (\$)	Quality	Price (\$)	Country
Diesel engine liner (HP-25)	Very good	13.10	Not good	16.07	China
Diesel engine liner (HP-20)	Very good	11.31	Not good	13.10	China
Diesel engine liner (HP-12)	Very good	8.93	Not good	10.36	China
Diesel engine piston (HP-25)	Good	9.52	Good	11.31	China
Diesel engine piston (HP-20)	Good	8.33	Good	10.12	China
Diesel engine piston (HP-12)	Good	5.65	Good	7.50	China
Gudgeon bush(HP-25/24/20)	Very good	1.79	Good	2.38	China
Gudgeon pin(HP-25/24/20)	Very good	1.43	Good	1.79	China
Pump 3"	Very good	16.07	Good	29.76	India
Impeller 3"	Very good	2.08	Good	No import	
Impeller 4"	Very good	2.20	Good	No import	
PT Chain cover SF/DF	Very good	2.98	Good	4.52	China
PT pulley (7", 7.5", 8", 8.25')	Good	10.12	Good	No import	
Clutch / normal V— pulley	Very good	5.36	Good	No import	
Clutch Bush	Very good	0.60	Good	0.89	China
Governor bush (big)	Very good	0.71	Good	0.83	China
Governor bush (small)	Very good	0.36	Good	0.48	China
Fuel tank 8 hp engine	Very good	16.07	Good	No import	
Fuel tank 6 hp engine	Very good	10.71		No import	
Fuel tank 4 hp engine	Very good	8.93		No import	



Note: Price list is based on a survey in 2022

Source: Alam, M. M. (2022)

Trend of Power Tiller Market

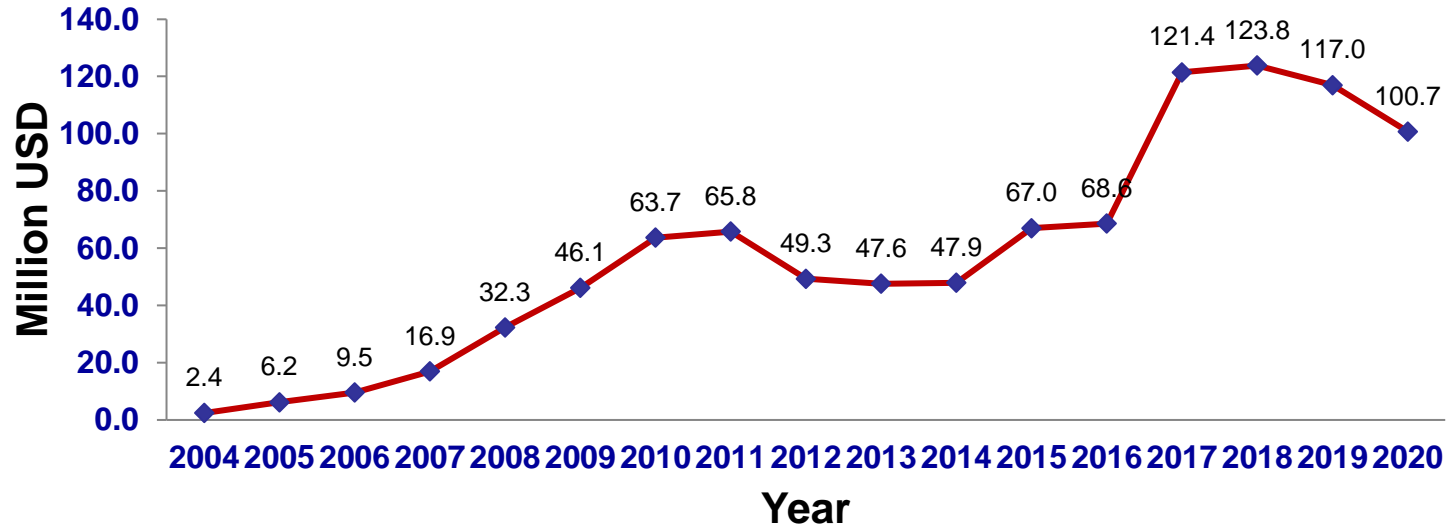


- ❖ Power tiller: 700,000 units
- ❖ Annual import: 26,850 units (5 Yrs avg.)
- ❖ Current year Import: 18,000
- ❖ Market worth USD 25.7 million

Trend of Power Tiller Market



Trend of Tractor Market

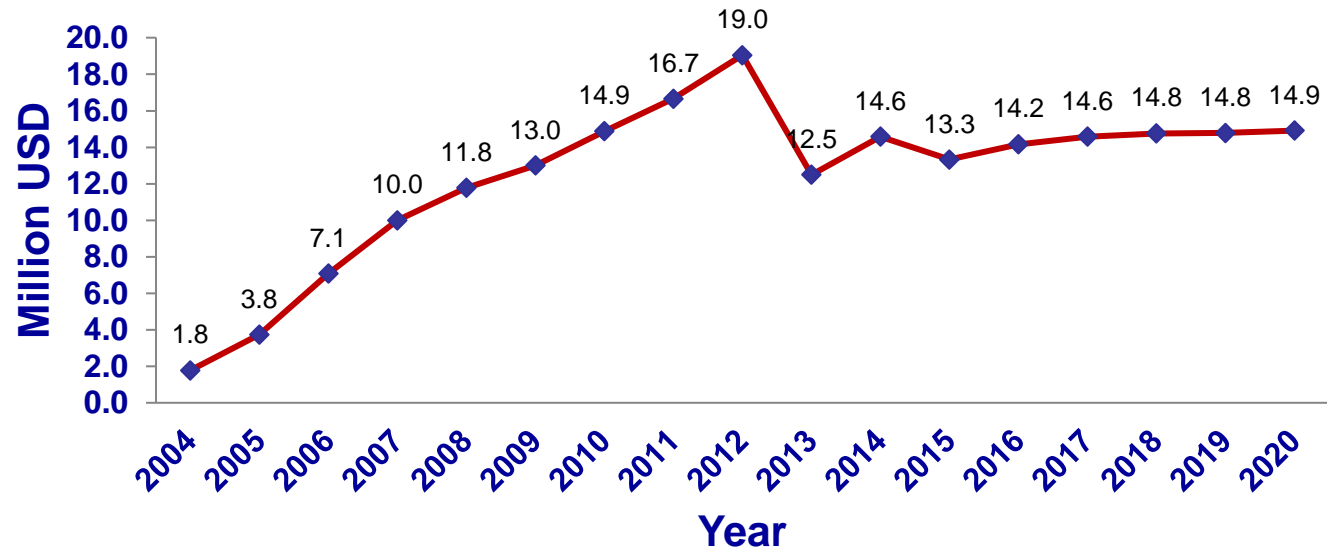


- ❖ Tractor: 60,000 units
- ❖ Annual import: 8,900 units (last 3 Yrs avg.)
- ❖ Current year Import: 7,050 units
- ❖ Market worth: USD 100.7 million

Trend of Tractor Market



Trend of Centrifugal Pump Market

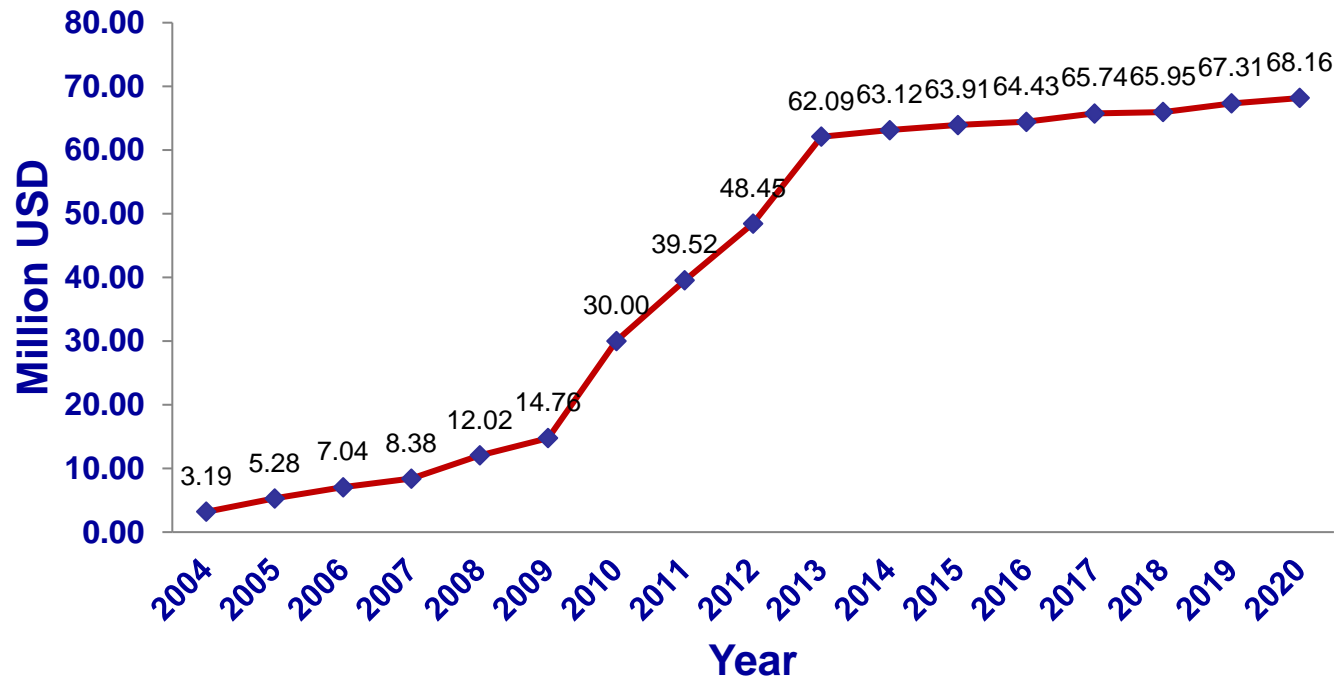


- ❖ STW: 15,75,136 units
- ❖ LLP: 300,613 units
- ❖ Annual production: 332,000 units (5 Yrs avg.)
- ❖ Current year production: 350,000 units
- ❖ Market worth: USD 14.90 million
- ❖ Local production: 85%
- ❖ Imported (China): 15%

Trend of Centrifugal Pump Market (STW and LLP)



Trend of Thresher Market



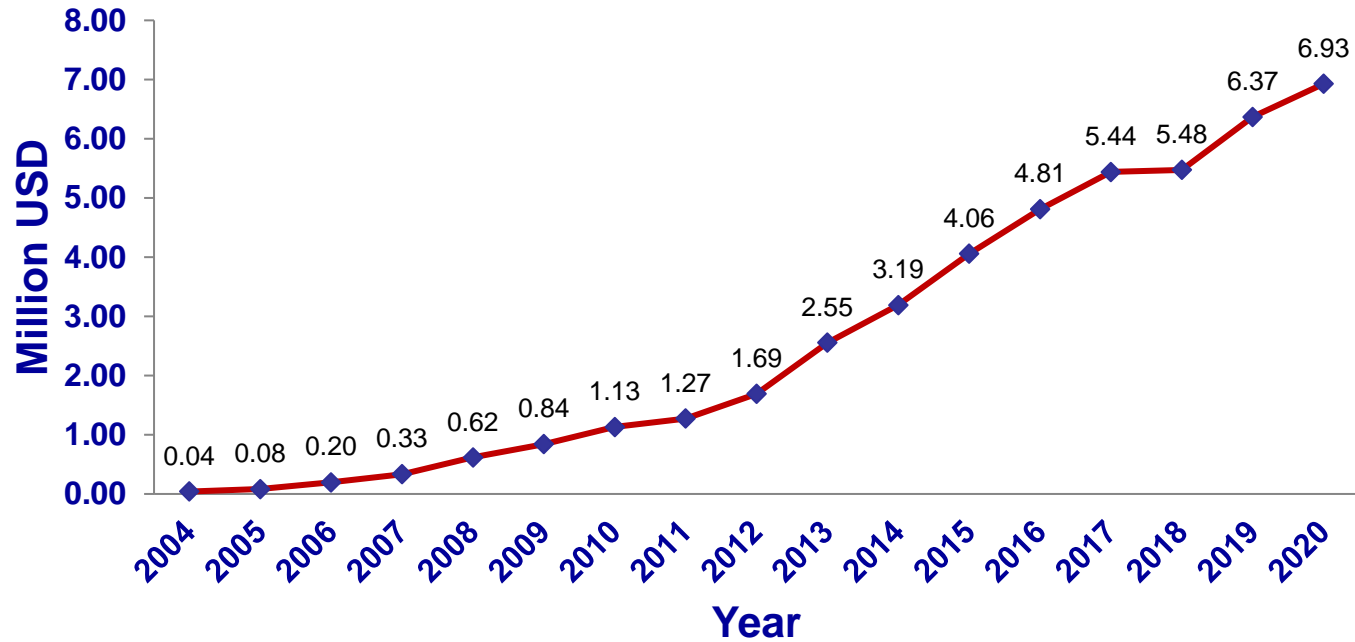
- ❖ Annual production: 114,000 units (5 Yrs avg.)
- ❖ Market worth: USD 68.16 million
- ❖ Local production: 100%

Trend of Thresher Market



Source: Alam, M. M. (2021)

Trend of Maize Sheller Market

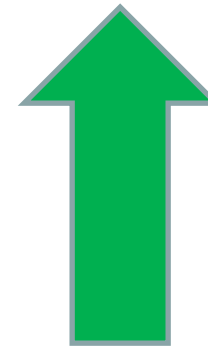
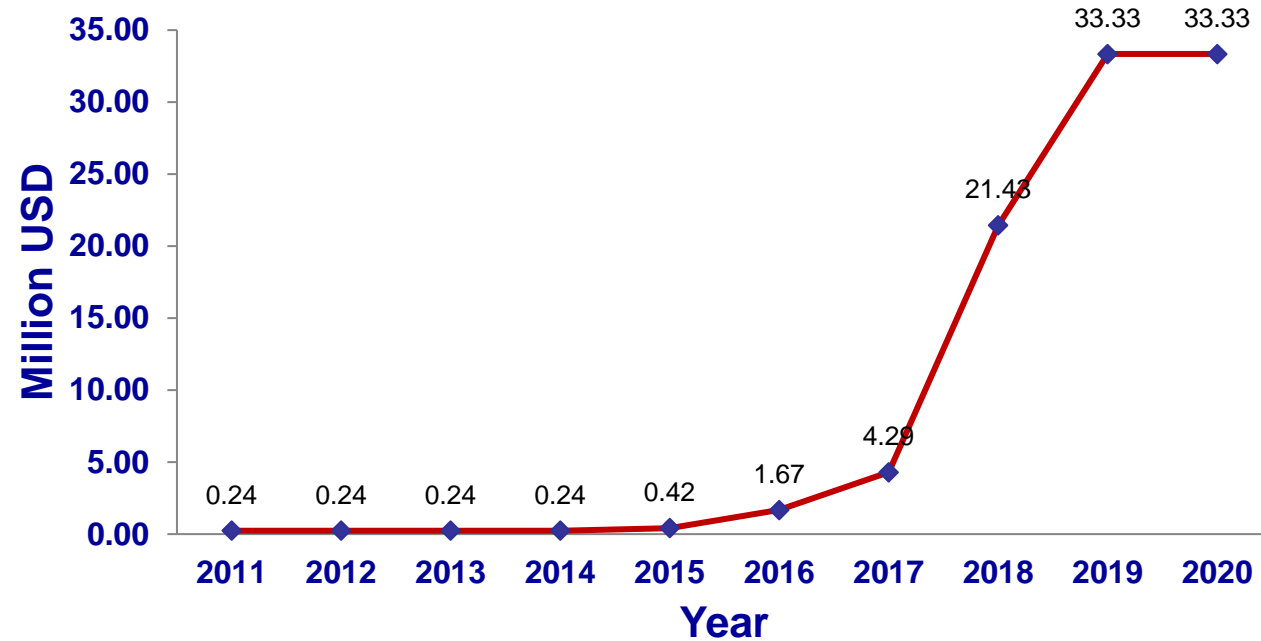


- ❖ Annual production: 15,000 units (5 Yrs avg.)
- ❖ Market worth: USD 6.93 million
- ❖ Local production: 100%

Trend of Maize Sheller Market



Trend of Combine Harvester Market



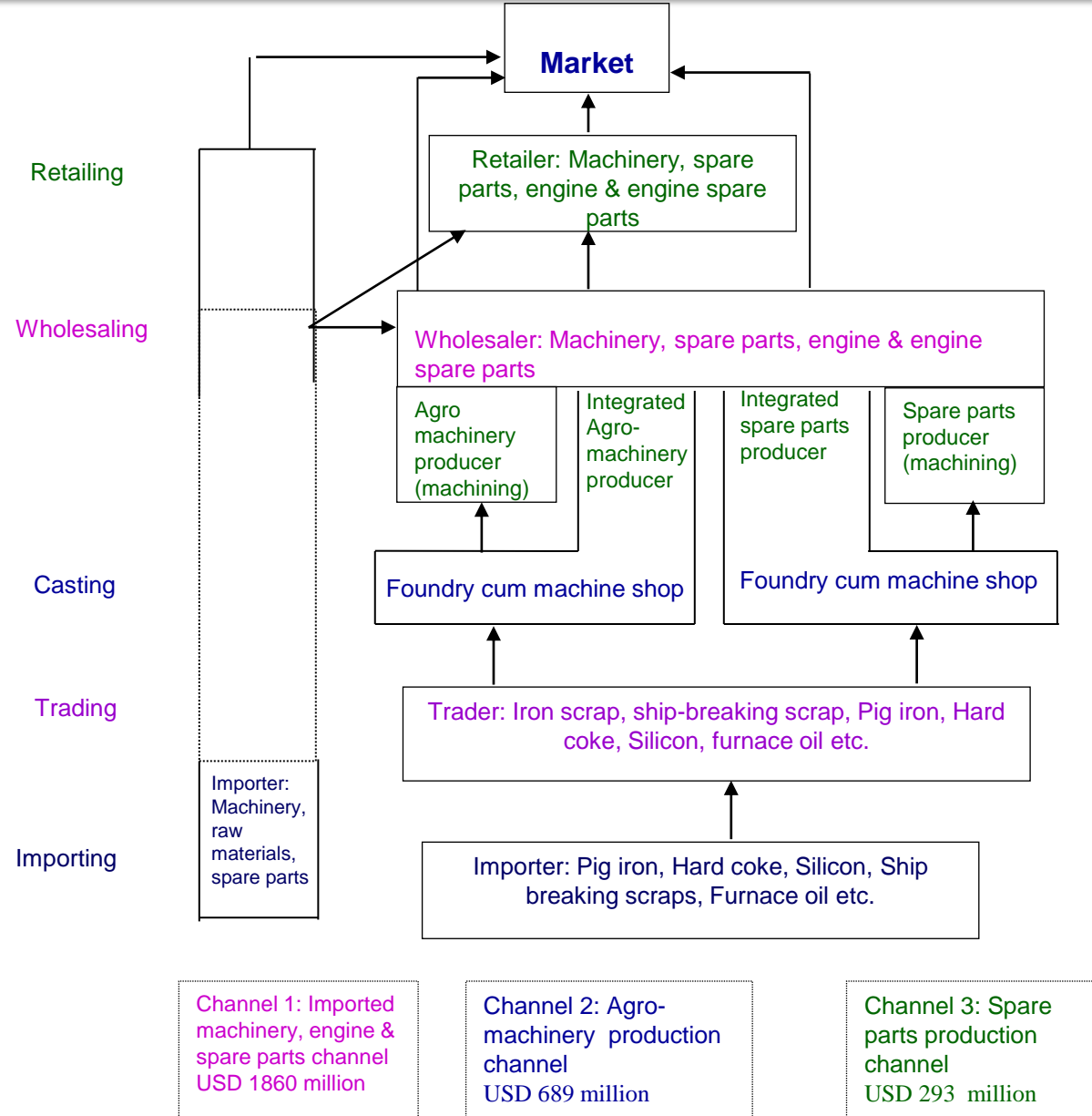
Agricultural Mechanization project of DAE boosts the use of combine harvester

- ❖ Annual Import: 700 units (5 Yrs avg.)
- ❖ Market worth: USD 33.33 million
- ❖ Imported: 100%

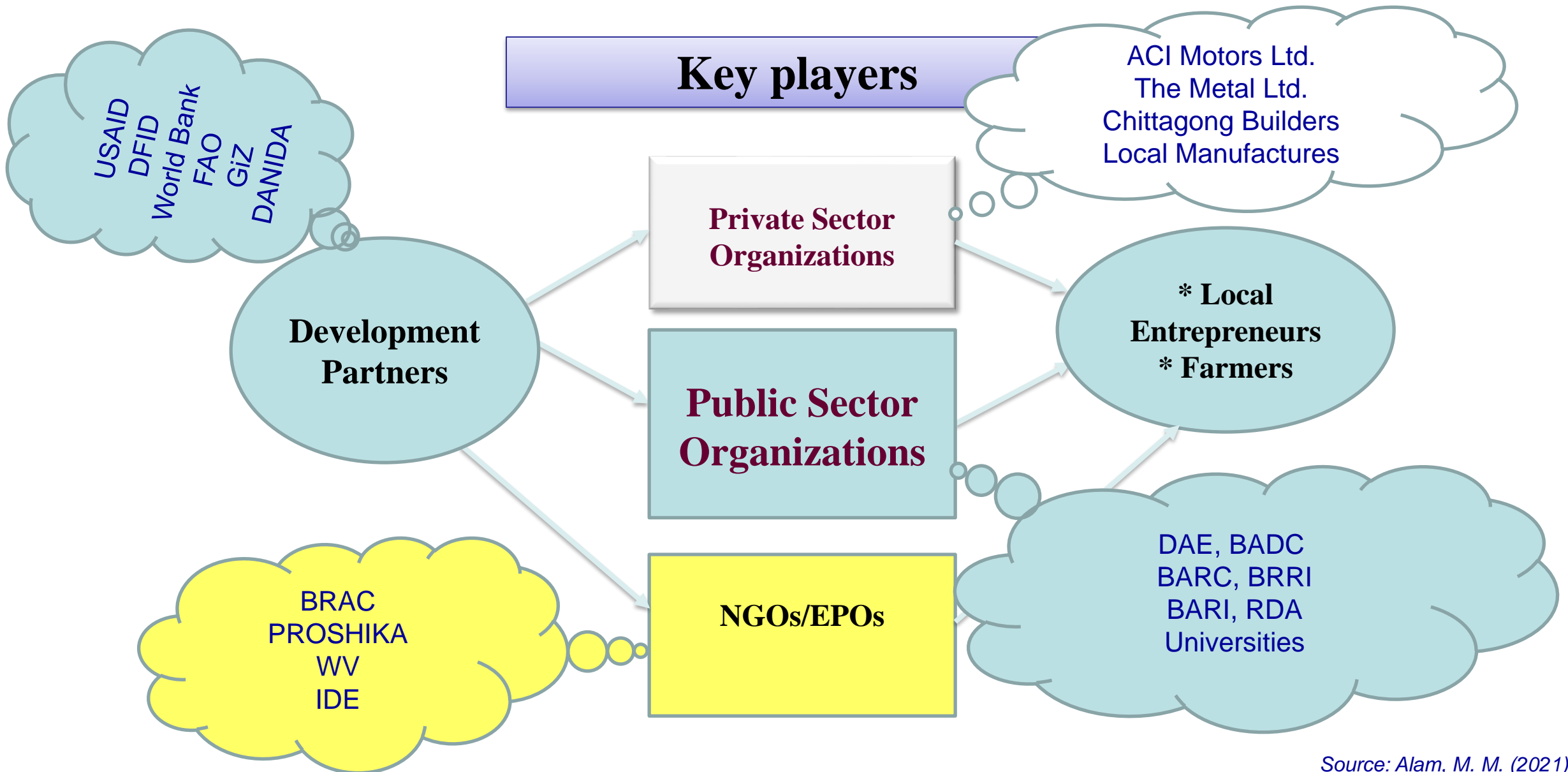
Trend of Combine Harvester Market



Supply Chain of Agricultural Machinery and Spare Parts



Key Players of Agricultural Mechanization Initiatives



Private Sector Initiatives



Key players

ACI Motors Ltd.
The Metal Ltd.
Chittagong Builders

**Importing, Marketing
and After Sales
Services**

* Local
Entrepreneurs
* Farmers

**Local Manufacturing
of Agricultural
Machinery and Spare
Parts**

Foundry: 70
Machinery manufacturer: 800
Spare Parts manufacturer: 1500

**Local Mechanics,
R&M Workshops and
Spare Parts Retailers**

R&M Workshop: 20000
Mechanic: 500000
Retailer: 40000

Strategies for Promoting Manufacturing Industry



Skill Development

Constraints	Business Development Services	Service Providers
<ul style="list-style-type: none"> Inadequate skill related to iron, alloy and brass casting, and heat treatment; fabrication and machining; R & M of agri-machinery; marketing and financial management at the producers as well as service providers level 	<ul style="list-style-type: none"> Provisions for skill development on iron, brass and alloy casting, and heat treatment of metals to workshop and foundry technicians 	Public sector training institutes: BITAK, BUET, BMTF, Development partners
	<ul style="list-style-type: none"> Provisions for skill development on machine fabrication and machine operation to workshop technicians 	Public and private training institutes; Manufacturing workshops; DFPM of BAU, BRRI, BARI
	<ul style="list-style-type: none"> Provisions for knowledge and information on basic operation, repair and maintenance to farmers, custom-hire service providers and mechanics 	Private training institutes; Manufacturing workshops; DFPM of BAU, BRRI, BARI
	<ul style="list-style-type: none"> Provisions for skill development on marketing and financial management to management personnel 	Public and private training institutes
<ul style="list-style-type: none"> Inability to collectively safeguard the interest of the sub-sector 	<ul style="list-style-type: none"> Provisions for strengthening capacity of Foundry Owners' Association of Bangladesh (FOAB), Bangladesh Shilpa Malik Samity (BSMS) and Bangladesh Agricultural Machinery Manufacturers Association (BAMMA) 	Business associations, Development partners, NGOs

Strategies for Promoting Manufacturing Industry



	Constraints	Business Development Services	Service Providers
Information Service	<ul style="list-style-type: none"> ▪ Inadequate information related to market size and cluster, and production technology at producers' level 	<ul style="list-style-type: none"> • Provisions for access to market information about market size, clusters of market and potential for export market to producers and sellers 	Agri-machinery business associations, GO (Ministry of Industries, foreign affairs), Development partners
	<ul style="list-style-type: none"> • Inadequate Bangla operation & maintenance manual of agri-machinery for mechanics, custom-hire service providers and farmers 	<ul style="list-style-type: none"> • Provisions for easy access to Bangla operation and maintenance manual to mechanics, custom-hire service providers and farmers 	Private companies, NGOs
Product Development	<ul style="list-style-type: none"> ▪ Lack of modern capital machinery 	<ul style="list-style-type: none"> • Provisions for access to information on modern technology and capital machinery 	BUET, BAU, BRRI, BARI, GO, NGO, Development partners
	<ul style="list-style-type: none"> ▪ Inadequate testing and standardization facilities of agri-machineries 	<ul style="list-style-type: none"> • Provisions for establishing common facility centers for testing and standardization in Bogura & Jashore 	GO, Private sector, Development partners
	<ul style="list-style-type: none"> ▪ Lack of innovation and continuation of agri-machineries 	<ul style="list-style-type: none"> • Provisions for establishing 'Central Institute of Agricultural Engineering' (CIAE), for continuation of innovation through R&D 	Government, Development partners

Strategies for Promoting Manufacturing Industry



	Constraints	Business Development Services	Service Providers
Input supply	<ul style="list-style-type: none"> ▪ Inadequate supply of quality raw materials 	<ul style="list-style-type: none"> • Provisions for uninterrupted supply of quality raw materials to manufacturers 	Business associations, GO
	<ul style="list-style-type: none"> ▪ Uninterrupted supply of electricity 	<ul style="list-style-type: none"> • Provisions for preferential treatment for supply of electricity to agri-machinery manufacturers 	PDB, PBS, Ministry of Energy
Business Development	<ul style="list-style-type: none"> • Lack of space and infrastructural facilities for agri-machinery manufacturers • Lack of scope for export in SAARC and developing countries 	<ul style="list-style-type: none"> • Establishment of 'Agri-machinery Production Zone' in Bogura and Jashore • Provisions for duty free access to SAARC and developing countries, and formal trading of agri-machinery at border markets (hats) with India 	GO (Ministry of Industries, foreign affairs), Business associations, SAARC and developing countries
	<ul style="list-style-type: none"> • Inadequate working capital and finance for capital machinery 	<ul style="list-style-type: none"> • Provisions for easy access to soft and flexible long and mid-term credit facilities 	Public and private sector banks, GO policy support
Policy Advocacy	<ul style="list-style-type: none"> ▪ Inadequate policies and regulations on importation of capital machinery and multiple VAT on imported raw materials 	<ul style="list-style-type: none"> • Provisions for appropriate policies and regulations on preferential treatment on capital machinery importation and multiple VAT on imported raw materials 	Business associations

Recommendations



- Bangladesh agriculture is transforming from subsistence to commercial agriculture where agricultural mechanization is one of the important drivers of this change.
- Agricultural machinery and spare parts market in Bangladesh is growing, and local manufacturing has potential to capture a major share of the market. However, the sub-sector needs intervention for a favorable business eco-system.
- Establishment of 'Agri-machinery Production Zone (APZ)' on the outskirts of the Bogura and Jashore towns to accommodate existing and potential agri-machinery industries and workshops.
- Establishment of 'Common Facility Centre' at each APZ to facilitate quality services related to heat treatment, material testing, test and standardization, advisory services etc. on public & private sectors and development partners initiative.
- Modernization of local Foundries through collaboration and experience sharing with SAARC and industrialized countries.
- Capacity building related to casting, heat treatment, fabrication and R&M of agri-machinery to the technicians along with marketing and financial management skills to the management personnel.
- Access to information on market, exports potential, modern capital machinery and improved production technology options for the manufacturers.
- Continue zero tariff on capital machinery import, and tax exemption on selected spare parts and add more components to that list.
- Ensure access to soft and flexible long and mid-term credit facility for capital machinery and working capital.

Acknowledgement



E-mail: mmalam@bau.edu.bd



Bangladesh Agricultural University

Innovation in Mechanized Agriculture and Green Energy



Home

Research Field

Research Team

Lab Facilities

Publications

Youth Network

Partners

Apply

Contact Us



Website Link: <https://image.bau.edu.bd/>