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Present status of small scale agricultural machinery manufacturers of Mymensingh region of Bangladesh

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ABSTRACT

Most of the developing countries like Bangladesh import this machinery from industrialized countries. As a result, most machinery is expensive and their operating cost is higher. If these machineries could be manufactured locally these might be adapted to our agro-ecological zones, are of lower price and moreover, local manufacturing companies would promote employment facilities as well as poverty alleviation. The present study was conducted to know the status of small scale agricultural machinery produced my local manufacturers in Mymensingh region. The study demonstrated that there were major problems in the promotion of local Agricultural Machinery Manufacturing Workshops are lack of capital, infrastructure, skilled personal, bank loan complexity, electric supply problem, lack of technical knowhow, unequal demand, storage, credit, marketing, insufficient use of public media for creating awareness among the farmers, absence of government initiatives, seasonal demand of agricultural equipments etc. The facilities of all the manufacturing workshops are not sufficient. Maximum employees have no academic certificate or training from any institute. There is no Agricultural engineer in any workshops in the study area. However government should promote these workshop for quality production agricultural machineries by taking appropriate strategies and supports.

INTRODUCTION

Bangladesh is predominantly an agricultural country. Her economy is agro-based, where more than 63.24% of the population is supported directly or indirectly on agriculture and produces 32.41% of the GDP during 1996/97. It earns about 24% of foreign exchange by exporting various agricultural commodities and products in 1996/97 (The Fifth Five Year Plan, 1997-2002).At present Agriculture sector produces 18.40% of the GDP during 2010-11(BBS Sept., 2011).

The present population (160 million) and population growth rate (1.41%) of country invite special attention for boosting agricultural production to feed the expected increase in her population. In order to be self sufficient in food. Production need to be raised at a minimum 4% per annum. In order to achieve this target Bangladesh must intensify land use through successful crop husbandry and by increasing cropping intensity through timely farming operations with the use of high yielding variety (HYV) seeds, efficient utilization of fertilizers, water, pesticides and use of agricultural machinery tractor, power tiller, weeders, sprayers, irrigation pumps, reapers, threshers etc. As cultivable land is limited to 8.44 million hectare, present cropping intensity of Bangladesh is 176% (BBS, 2008). A limited time span left between crop seasons (Rabi and Kharif) has compelled the farmers to use agricultural

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machines so as to get two or more crops a year, Because of farmers are often unable to prepare their land for the next crop with available human and draft animal power (DAP).

Agriculture is the heart of Bangladesh economy, and rice remains its lifeblood. More than 33 million tons of rice was produced in 2011. It is one of the major sectors contributing 18.43% to the GDP with a growth rate of 12.48% as recorded in 2010-11(BBS Sept., 2011) and employs around 44% of the total labor force of the country. The performance of this sector has an overwhelming impact on major macro-economic objectives like employment generation, poverty alleviation, human resources development and food security. Self-sufficiency in rice has been closely achieved, but there are clearly more gains to be had: average per hectare output of rice remains lower than in India, Vietnam and China. Furthermore, migration of farm labor force to non-farm more attractive jobs have already created negative pressure on productivity. Therefore, land and labor productivity in Bangladesh has to be increased. Focusing on the complementary agriculture, agricultural machinery sectors provide a powerful opportunity to do so. In doing this, Bangladesh has been pursuing complementary farm mechanization, not from the supply side, but from the demand side, organizing market pressure and developing strategic services that enable manufacturers and importers to respond appropriately.

In general agricultural mechanization has been gained popularity among the farmers for its multi-dimensional benefits such as reduction of operational cost and human drudgery, timeliness of operation, increased labor productivity and efficiency. Limited agricultural activities such as land preparation, irrigation, weeding, spraying and threshing of crops have been mechanized at least partially in Bangladesh. It needs to be extended horizontally throughout the country to harness more benefits out of it. Other labor intensive agricultural activities such as sowing seed and seeding, fertilizer applicator, drying, water saving technology and water management, storing and processing are equally demanding areas of mechanization.

Generally agricultural machinery and implements are manufactured by the industrialized countries. They have done primarily on commercial basis with little or no efforts to test and demonstrate agricultural machinery under local conditions. Most of the developing countries like Bangladesh import this machinery from industrialized countries. As a result, most machinery is expensive and their operating cost is higher. If these machineries could be manufactured locally these might be adapted to our agro-ecological zones, are of lower price and moreover, local manufacturing companies would promote employment facilities as well as poverty alleviation.

Small and large irrigation pumps (up to 2 cosec), plant protection equipment, some PT spares and power threshers are made locally with limited facilities and investments (Sarker, 1997). There is no adequate information about local Agricultural Machinery Manufacturing Industry (AMMI).

In a summary the currently (2010-11) available statistics of farm machinery in Bangladesh is presented in Table 1 below.

Table 1: Current statistics on farm machinery in Bangladesh

SL.No	Farm Machinery	Number of units
1	Power tiller	About 5,50,000
2	Tractor	35,000
3	Low lift pump	1,50,613
4	Shallow tube well	14,25,136
5	Deep tube well	32,102
6	PT operated seeder	30
7	Weeder	>200,000
8	Guti urea applicator	5,200
9	Sprayer	12,50,000
10	Combine harvester	About 60
11	Reaper	About 140
12	Open drum thresher	>150,000
13	Closed drum thresher	>2,20,000
14	Winnower	About 500
15	Dryer	>700(including rice mill)
16	Maize Sheller (power & hand)	18,100

Source: Alam et al. (2011)

Often AMMI reflects the stage of development of the farming sector and its constituent Farming system, the level of economic development and the degree of industrialization (Guntz and Morris 1991). AMMIs are establishing slowly in this country. For economic development it is very important to promote mechanization and AMMIs simultaneously. Mechanization by using only imported implements may arise problems in unemployment. A great deal of the country's foreign exchange earnings could be saved through local manufacture of farm machines if the resources permit. Moreover, it also creates technical knowhow among the people and sufficient job opportunities for local skilled and unskilled labor. In addition, the locally manufactured machines could be modified according to agro-ecological needs of various reasons of the country and maintenance costs of machines could be reduced and life enhanced if the spares and after-sale services are locally available.

For proper planning in Mechanization, adequate information about AMMI is essential. For policy maker without proper information it is difficult to make policy about mechanization and AMMI. The study will be helpful for planner researcher, manufacturer as well as user by giving latest information about status of local AMMI and its problems. The lack of studies on local machinery manufacturing can impose serious constraints on planning agricultural policy system. In this content a research work was undertaken to study the actual situation and constraints of Agricultural Machinery Manufacturing Industries in Bangladesh. The study was performed in Mymensingh region to explore the existing status of the Agricultural Machinery Manufacturing workshops in terms of technical, production facilities and employment in selected areas. And to identify the problems in the promotion of local Agricultural Machinery Manufacturing workshops.

MATERIALS AND METHODS

The study was based on field survey where primary data were collected systematically by means of an interview schedule from individual manufacturer. Some agricultural machinery manufacturing workshop (AMMW) were selected purposively for the study and visited for the purpose collection of relevant information. A semi structured questionnaire was prepared according to the objectives of the study with active consultation with key informants, expert from the relevant fields and secondary information. Furthermore, a check list was developed for key informants. The draft questionnaire and the check list were pre-tested and necessary corrections, modification and alternations were made accordingly.

Selection of the study area

The study area and sample units were selected based on the availability and concentration of agricultural machinery manufacturing workshop (AMMW). Although AMMWs are situated all over the country, two districts town were selected. The selected area was Mymensingh region. Maximum AMMWs in Bangladesh are situated in district town. In Mymensingh all authorized AMMWs are located in district town. Four AMMWs were select for study in Jamalpur, Station road and BSCIC area. These were a) Mahbub engineering workshop, b) Mokles engineering workshop, c) Maysearch Jewel engineering workshop, d) Maysearch Mah engineering workshop. One AMMW was observed in Shamgonj, Mymensigh, namely Vai-Vai engineering workshop. In Kishoregonj six AMMWs were studied and all these were located in station road, namely a) Aulad maraikol industries, b) Al-Amin maraikol, c) Amicus agro limited, d) Krisan maraikol, e) Sohan engineering workshop, f) Prantor engineering workshop.

Preparation of interview schedule (Questionnaire)

The draft interview schedules (Questionnaire) were prepared according to the objective of the study. With the draft schedules the study area have been visited and primary information were collected. The answers, which obtained from the manufacturers were carefully checked and desired correction. Modification and addition were made in the schedules, and then information was collected carefully.

Data collection

Through personal interview data were collected (Figure 1). The information on manufacturers facilities, employees and problems of the workshops such as set up, running, marketing and also suggestion to overcome the problems from them were collected. During the interviews of manufacturers each question was explained to them clearly and tried to find out fact as much as possible. Before taking interview, the whole academic purpose of the study was clearly explained to the respondents. Initially many of the respondents used to be doubtful to answer the questions. When they are assured that the study was purely on academic one and was not likely to have an adverse effect on them, they tried to make co-operation. They manufacturers do not keep record available information about their working activities.

Figure 1: Data collection from Jamalpur Mahabub Engineering Workshop, BSCIC industrial area, Jamalpur-2000

The necessary data were collected to highlight the static and dynamic attributes of the facilities and problems of Agricultural Manufacturing Workshops. For adequacy, accuracy and reliability of data, the collected data were check and consistency was determined.

RESULTS AND DISCUSSION

The present study was conducted to find out the constraints and prospects of some selected Agricultural Machinery Manufacturers of different sizes in Jamalpur, Kishoregonj and Shamgonj. The production capacities, production facilities and opportunities were identified in this study. The study also identified the potentiality in promoting Agricultural Machinery Manufacturing workshop. A total of 11 Agricultural Machinery Manufacturers workshop were visited in the study areas of which 4 in Jamalpur, 6 in Kishorgani and 1 in Shamganj.

Table 2: Number of workshops studied in the selected areas

Study area	Jamalpur	Kishorganj	Shamganj	Total
Studied AMMW	4	6	1	11

Technical facilities available in AMMW

Design and drawing facility

It was observed that in Kishorgonj 67%, Jamalpur 25% and Shamgonj 100 % had design and drawing facilities (Table 3). Those who had no design and drawing facilities, they manufactured by eye estimation. Some of them got design and drawing facility from BRRI, BARI and BAU. They also claim that they have ability to make any implement by eye estimation.

Table 3: Technical facilities of AMMW in different region

Facilities	Jamalpur No. (%)	Shamgonj No. (%)	Kishoregonj No. (%)	Total No. (%)
Design and drawing	1(25)	1(100)	4(67)	6(64)
Laboratory	-	-	-	-
Testing	1(25)	1(100)	4(67)	6(64)
Quality control	-	-	-	-

Laboratory facility

Most of the AMMW have no laboratory facility to maintain the products quality. In the observed area in Kishorgonj, Jamalpur and Shamgonj not a single workshop was found with laboratory facility. To improve existing efficiency and quality of product laboratory facility is essential (Table 3).

Testing facility

It has been observed that in Kishorgonj 4 out of 6, in Jamalpur 1 out of 4 and in Shamgonj 1 out of 1 workshop had testing facilitities (Table 3). Overall in 3 region 64% manufacturers have testing facilities.

Quality control facility

In respect of quality control, most of the manufacturers have reported that the worker's workmanship is so reliable that they guarantee the quality control of the product. However, the quality control by the government is not yet institutionalized.

The production facility of AMMW in studied area was not satisfactory (Table 4). Lathe machine, Drilling machine, Grinding machine, Welding machine and Air compressor were found in all the workshops but Shaper machine, Power press, Milling machine, Mechanical saw, Sheet metal, Foundry, Hobbing machine, Heat treatment and Casting were not found in all the workshops.

Table 4: Production facility of AMMW in studied area

Machine Type	No. of workshops(%)in Jamalpur	No. of workshops(%) in Shamgonj	No. of workshops(%)in Kishoregonj
Lathe machine	4(100)	1(100)	6(100)
Shaper machine	-	-	-
Power press	-	-	-
Drilling machine	3(75)	1(100)	6(100)
Grinding machine	4(100)	1(100)	6(100)
Welding machine	4(100)	1(100)	6(100)
Milling machine	-	-	-
Mechanical saw	-	-	2(33)
Sheet metal	-	-	-
Air compressor	1(25)	1(100)	4(67)
Hobbing machine	-	-	-
Foundry	-	-	-
Heat treatment	-	-	-
Casting	-	-	-

Table 5 shows that Open drum power thresher, Closed drum power thresher, Maize Sheller, Power Push pull weeder (dry and wet) are available in all the workshops but Open drum pedal thresher, Self-propelled reaper, Centrifugal pump, Corn Sheller hand, Manually operated Maize Sheller, Hand pump, Power tiller (Body), Trolley with wheel, Concrete mixture machine, Pinion, Power tiller parts, Guti urea machine, Fish feed machine, Potato grader and Hand sprayer are not available in all the workshops.

Employment status

The overwhelming majority of Agricultural machinery manufacturing workshops in studied area of Bangladesh are small in size where they did not appoint graduate engineer. Only few AMMW in Kishorgonj have some Diploma Engineer but the number is too little. One workshop out of 6 in Kishorganj has Diploma Engineer. There are a large number of labor & technician engaged in this AMMW by contract basis according to demand. But there have some permanent labor in all AMMW in Jamalpur, Kishorgonj and Shamgonj according to size and demand. In peak season some labor are contracted and at first time they are unskilled then, they are

trained by skilled person who are engaged there permanently.

Problems of local AMMW

There are many problems associated with Agricultural machinery manufacturing workshop in Bangladesh. To know the problems of AMMW data were collected and broadly classified in three categories, such as; i) Problems before going to production (Table 6), ii) Problems during production (Table 7) and iii) Problems after going to production (Table 8)

However, a number of problems are associated in AMMW in study area before going to production. Table 6 shows that the list of problems faced with number of workshop. All manufacturing workshop in study area faced lack of capital problems before going to production. Lack of infrastructure is another problems faced by manufactures when set up workshop. In Kishorganj 33% workshops and in Jamalpur 75% workshops have faced lack of infrastructure problem. The entire manufacturing workshop in study area faced the competitive behaviour from other organization and the percentage is 100% to all workshops. Labour is available but skilled labour scarcity is one of the most important problem in AMMW in Bangladesh. All of the manufacturers in Mymensingh region faced no problem in taking Bank loan getting electric supply facilities is a major problem in studied area. About 75 %and 33% AMMW in Jamalpur and Kishorgonj faced lack of technical knowledge.

Table 5: Existing products list

Name of products	Number of manufacturing workshop		
	Jamalpur	Shamgonj	Kishoregonj
Open drum pedal thresher	-	-	-
Open drum power thresher	4	1	6
Closed drum power thresher	4	1	6
Self-propelled reaper	-	-	-
Centrifugal pump	-	-	-
Corn Sheller hand	-	-	-
Maize Sheller Power	1	1	-
Manually operated Maize Sheller	-	-	-
Hand pump	-	-	-
Power tiller(Body)	-	-	4
Push pull weeder dry and wet	1	1	1
Trolley with wheel 1.Manually 2.Power operated	 - -	 - -	 4 -
Concrete mixture machine	-	-	-
Pinion	-	-	-
Power tiller parts	-	-	4
Guti urea machine	1	1	-
Fish feed machine	-	-	-
Potato grader	1	-	-
Hand sprayer	-	-	-

Financial problem is faced in the entire Agricultural machinery manufacturing workshop in whole surveyed area. This problem becomes senors during peak production season. Interruption of electric supply is observed everywhere of the surveyed area.

Skilled labour scarcity is a serious problem in manufacturing workshop, in Kishorganj 67%, in Jamalpur 75% and Shamgonj 100% during production (Table 7) when an unskilled labour becomes skilled, he leaves the workshop for more facilities in abroad or other workshop.

Most of the workshops in study area face a problem of seasonal demand of agricultural equipment. Demands for agricultural equipments are not uniformly distributed through outside of the whole year. These equipments are seasonally used and so their demand is seasonal. At peak demand the manufacturers cannot fulfill the requirement but most of the time they have no work, as demand is seasonal. About 33% and 75% manufacturing workshops in Kishorganj and Jamalpur faced lack of technical knowledge during production.

About 33% and 75% manufacturing workshops in Kishorganj and Jamalpur have storage problem as demand is seasonal. All the manufacturing workshops in study area faced double taxation system. The imported Agricultural machineries were free from VAT. Therefore locally made agricultural machinery price becomes high.

Table 6: Problems before going to production

Problems	No. of workshops (%)in Jamalpur	No. of workshops (%)in Shamgonj	No. of workshops (%)in Kishoregonj
Lack of infrastructure	3(75)	-	2(33)
Competition behave from other	4(100)	1(100)	6(100)
Lack of skilled	3(75)	1(100)	4(67)
Bank loan complexity	-	-	-
Electric supply	4(100)	1(100)	6(100)
Political/group interference	-	-	-
Lack of technical knowledge	3(75)	-	2(33)
Lack of capital	4(100)	-	2(33)

Table 7: Problem during production

Problems	No. of workshops (%)in Jamalpur	No. of workshops (%)in Shamgonj	No. of workshops (%)in Kishoregonj
Financial problem	4(100)	-	2(33)
Interruption of electric Supply	4(100)	1(100)	6(100)
Skilled labour problem	3(75)	-	2(33)
Raw materials problems	-	-	-
Unequal demand	-	-	-
Lack of Technical knowledge	3(75)	-	2(33)
Storage problem	3(75)	-	2(33)
Double tax system	-	-	-

About 33% and 75% manufacturing workshop in Kishorganj and Jamalpur faced credit problem.33% and 75% in Kishorgonang and Jamalpur faced storage problem. Manufacturing workshops of Mymensingh region faced no seasonal demand problem.

Kishorganj face logistic support problem in 33% workshops whereas Jamalpur AMMW have faced this problem in 75% workshops. Extension problem is another major constraint in Bangladesh for AMMW as most of the workshops are small in size. There are some small workshops they do not know about extension programme. 100% manufacturing workshop in Mymensingh region face this problem. Manufacturing workshops face no marketing and distribution problem. According to Agro Based Industries and Technology Development Project (ATDP), lack of machinery design is another problem in promotion of Local manufacture. Bangladesh lacks simple marked-tested machinery design that could be produced will local materials and low volume production technology. Most manufacturers were not aware of the many IRRI machines that are lying at BRRI and BARI. The IRRI machines were specially

designed for low volume production and have a Great potential for local manufacturer of Bangladesh. Many manufacturers complain of the absence of any government incentives and of frequent policy shifts, which hinder their development. Frequent changes in government policies generally affect manufacturers more than traders because of the long-range investments involved in production facilities. It is essential therefore that policies and incentives affecting manufacturing be instituted consistently over at least a five year period. The government also needs to establish procurement policies that provide preferential treatment to locally produced goods. Agricultural machinery demand is highly seasonal and hence manufacturers and dealers must carry sufficient stock to cater to the short seasonal sales.

Table 8: Post production problem

Problems	No. of workshops (%)in Jamalpur	No. of workshops (%)in Shamgonj	No. of workshops (%)in Kishoregonj
Credit	3(75)	-	2(33)
Ware house/storage problem	3(75)	-	2(33)
Seasonal demand	-	-	-
Logistic support	3(75)	-	2(33)
Extention problem	4(100)	1(100)	6(100)
Marketing problem	-	-	-

CONCLUSION

The use of Agricultural Machinery is increasing and hence different types of equipments are made locally. The facilities of all the manufacturing workshops are not sufficient. Maximum employees have no academic certificate or training from any institute. There is no Agricultural engineer in any workshops in the study area. The manufacturing workshops are not technically sufficient. Maximum manufacturing workshops are seasonal. The quality of machine is more or less satisfactory in comparison to input cost but sufficient quality control facility is not contained in the selected areas.

The major problems in the promotion of local Agricultural Machinery Manufacturing Workshops are lack of capital, infrastructure, skilled personal, bank loan complexity, electric supply problem, lack of technical knowhow, unequal demand, storage, credit, marketing, insufficient use of public media for creating awareness among the farmers, absence of government initiatives, seasonal demand of agricultural equipments etc.

For desirable agricultural development, the government policy and strategy is important to improve above situation in Agricultural Machinery Manufacturing Workshops.

SUGGESTIONS

Some suggestions are given below based on study observation.

- Radio, TV and other mass media should be used for dissemination of Agricultural Machinery.
- Developing skills related to fabrication and machining; iron, iron alloy and brass casting and heat treatment and R&M of Agril. Machinery to the technicians working at different production units(foundries and machine shops)
- Govt. should give subsidy directly to the farmer and manufacturer.
- The program for agro-industries development should be taken according to suggestion of the farm Machinery committee.
- Complexity of taking bank loan should be removed for both manufacturers and farmers.
- Seminar, Workshop should be arranged between different types of manufacturers, researchers, and other related organizations to minimize the distance between researcher, manufacturer or other related organizations.
- More training institute should be established at convenient places of the country to meet skilled labor requirements of these workshops where Agricultural Engineer should be employed.
- Govt. should give bank loan at low interest rate to the manufacturer and farmer.
- There should be a good linkage among the farmers, manufacturers, and researchers.

- Provides display center to introduce the farmers with new technologies/machines by govt. initiatives.
- DAE field level Agricultural Engineers can be disseminate agricultural machinery extensively to the farmers and to train persons employed in small Agricultural Manufacturing Workshops and machinery users.
- GO and NGO can give short term loan by cash credit pledge.
- Strengthening capacity of Agricultural Machinery Manufacturing Association Bangladesh to safe guard the interest of the sub sector.
- Establishment of National Standardization committee for agricultural machinery and equipment.

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