CLP Market Assessment

Market system for maize – Gaibandha chars

Abdur Rob

Practical Action Consulting

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Contents

1. Introduction

1.1 Objective of this study

To examine opportunities for market development in the maize market system that is important for CLP participants in Gaibandha. Identify the main market development opportunities, outline support needs, and identify actors and resources needed to realize more reliable income and employment opportunities.

To produce an exemplary market-system report that demonstrates market-system mapping and illustrates the kind of results, findings and recommendations that can be expected to emerge from using a market development approach in design of future interventions.

To orientate key staff in the CLP market development unit to the market-system mapping approach – through their active participation in the fieldwork planning, data collection and interpretation of results.

1.2 Rationale for selection of maize market-system

CLP continues to operate in the Gaibandha char area. The programme wants to support its graduated core beneficiaries and selected new beneficiaries to undertake higher value agricultural products so that they can increase their income from production, negotiate with markets and sell for achieving secured livelihoods.

Maize is one of the field crops most suitable for cultivation on char sandy-loam soils. Demand for maize is very strong in Bangladesh, due to the growth of its use as feed-stuff in poultry, cattle and fishery production. Although nationally production has grown rapidly from a very low base in the last ten years, it has still not reached anything like its full potential – with imports still making up 30 – 40 % of the country's needs. Due to the dependency on imports, maize prices within Bangladesh are generally driven by international market – where the current long-term trend along with other cereal crops is for sharply rising prices.

On the chars, maize cultivation is already practiced by larger land-owners, and produces good returns on investment. There appears to be good opportunities for smaller farmers to benefit, provided critical constraints in the area of access to quality seeds, inputs, processing and storage can be addressed.

2. Location and methodology

2.1 Locations of assessment

The study conducted in Fulchari and Sadar upazilas of Gaibandha district. The area was chosen by CLP because the study findings could be used to develop maize market system in this area.

2.2 Methodology

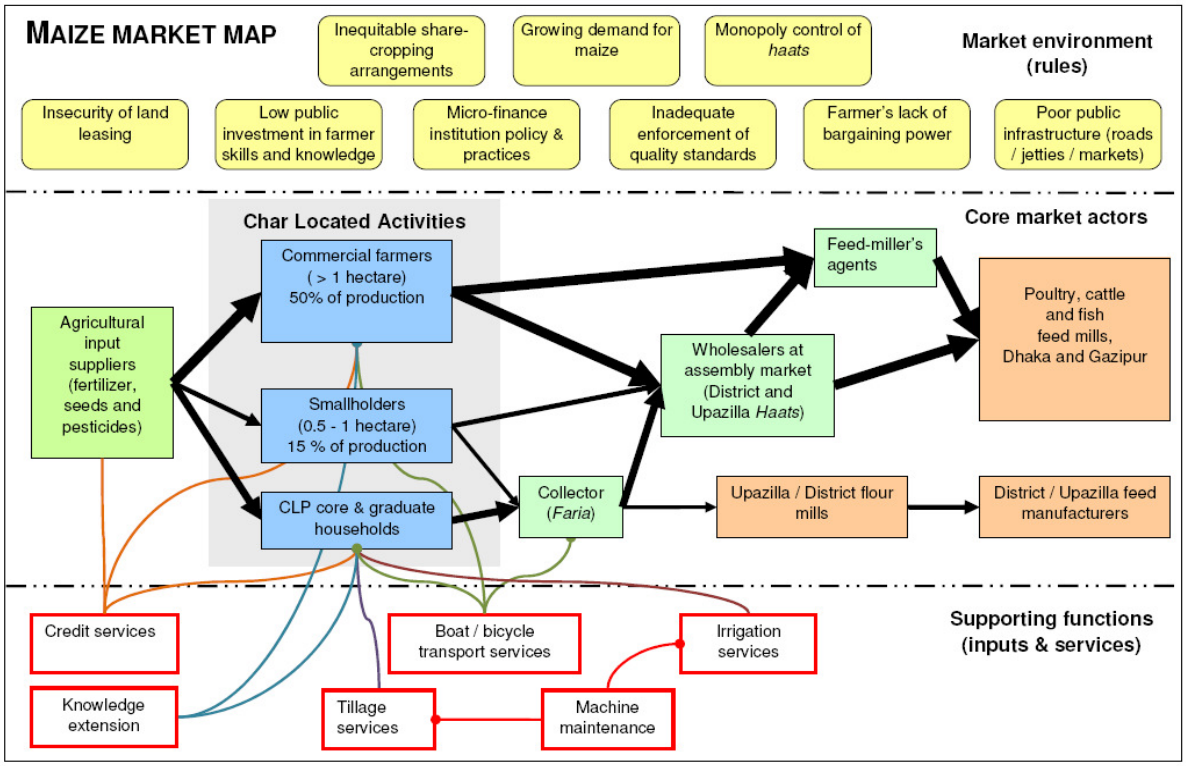
A 6 member team (comprised of CLP staff and staff of its implementing organization) was formed and led by a senior staff from CLP market development unit. The team attended a 3 days orientation on market assessment. Desk information review; primary data collection through in-depth interview; focus group discussion; PRA exercise on seasonal calendar; participatory market mapping workshops with market actors and stakeholders were the main methodology of the study. Study tools were developed for collecting information from the following market actors and stakeholders in Fulchari and Gaibandha Sadar Upazila.

Actors interviewed or participated in focus group discussion and interview include

20 Farmers	4 Collectors
10 Seed and input sellers	2 Wholesalers
4 Tractor operators	2 Transporters
2 Water sellers	3 Banks and MFIs
2 Chatal owners	5 DAE staffs

Findings are also validated by organizing a market mapping workshop with different stakeholders and comparing with the secondary information.

3. Maize market system



3.1 Core market-chain functions

Procurement and supply of maize seed, fertilisers / pesticides

Farmers buy seed, fertiliser and pesticides from retailers in the mainland either on credit or cash depending on the situation of the farmers. Some retailers either sell seed or fertilizers/pesticides only. (Details of seed, fertilizers and pesticides suppliers have been discussed in supporting function section).

Tillage (& fertilisation) of land

In the study area, most of the farmers use power tiller for land preparation and a very little percentage of farmers use country plough and tractor. They apply ploughing by 3 - 6 times.

At the end of land preparation urea, TSP, Gypsum, Zinc Sulfate, Boric Acid and cow dung have to be used. Half of the total Urea should be applied at the time of tillage. The remaining Urea would be used in 2 installments i.e. after 30-35 days and 40-45 days of sowing.

Sowing

Farmers sow various types of maize variety which include 900M, NK 40, Pacific 60, Pacific 11 and Pacific 984. They start sowing in November and continue up to January. Most of the farmers in the area follow late sowing time.

Irrigation of land

Most of the maize in char areas is cultivated in the Rabi season considering the risk of flood, land reduction and drying and storing during rainy season. In kharif season, char people focus on rice cultivation.

For growing maize in Rabi season, irrigation is necessary. Normally, 3-4 irrigation is enough. But in char 3-6 irrigations are needed due to sandy nature of the land. Following section shows irrigation system:

First irrigation starts after 15-20 days of sowing.

Second irrigation after 30-35 days of sowing

Third irrigation after 60-70 days of sowing

Forth irrigation after 85-95 days of sowing

During flowering and fruiting stage irrigation should be done carefully to avoid water logging in the land for long time. Weeding is also important at this stage.

Weeding & spraying

Various diseases spread during maize growing stage. Regular weeding, spraying is necessary to maintain plant health.

Harvesting

Farmers harvest maize in April and May.

Crop drying and shelling

In char area there is no cemented *chatal* (drying ground). After harvesting, farmers sundry maize in their courtyard for 2/3 days and store it under the shed until they can sell it. Sometimes higher loss occurs due to rain. It greatly affects the quality of maize and results in low price and less profit from maize farming. Women farmer or day labour are involved for threshing maize. For hired women labour farmers pay 2kg of maize for one mound (40 kg) of maize separation. It's a costly activity.

There are about 25 shelling machine have been providing shelling services in the study area but due to huge demand for this service and long waiting time including high rental fee (Tk.20-Tk.25 per mound), many farmers shell maize by hand.

Storage

Normally, farmers do not store maize as they cannot dry maize up to required level (10-12% moisture content) for storage. But sometimes due to weather or communication problem they have to hold it for a while.

Bulking up on chars

Local collectors visit char area for purchasing maize from farm gate. Apart from this, some external buyers visit char area by boats and buy maize at the river side where farmers bring their maize by using service of bicycle puller. Otherwise, no bulking up takes place at char level.

Transporting to mainland

Boat is the main means of transporting maize from char. During dry season farmers bring their maize to boat landing site with help of bicycle pullers who claim TK. 20 per mounds of maize.

Bulking up on the mainland

Local Paikar or trader and wholesaler in Fulchari and Gaibandha buy maize from the large farmers. They sundry and store it for selling to the feed processing company agent or send to processing plants directly.

Milling / processing

Industrial maize milling in Bangladesh uses dry milling converts maize into poultry, cattle or fish feed and corn flour. Before milling, maize kernels must be dried in order to decrease the moisture content to between 10-12%. This is done, more often, with the help of naturally occurring sunshine. Once dried, the maize grain is ready for processing.

Almost 95% of maize milled for animal feed, only 5% used as corn flour. Some people fry and then grind the maize to make *Chatu* (maize powder). Maize flour is also mixed with wheat flour and used in bread, *chanachur* (Bombay mix) to reduce cost of ingredient used in these products.

In Gaibandha, there are some small scale poultry feed sellers who locally produce and sell poultry feed to small scale farmers. They play an important role in the absence of large feed mills.

3.2 Rules / Business environment

Quality of inputs

Most of the retailers in the mainland or char area selling seeds, fertilizer, pesticides, micronutrients are of low quality or adulterated by different means. Interview with farmers confirms that all most all farmers are not able to recognize quality inputs. They informed that except one or two retailers, most of them promote inferior quality inputs to get more commission and to make more profit. Sometimes inputs seller also lack knowledge and awareness about the quality inputs.

DAE on behalf of Upazila service monitoring committee is responsible for monitoring the availability and quality of inputs such as seeds, fertilizers, pesticides. But due to lack of man power, resource and other socio-political factor, they cannot play this role effectively.

However, the situation is improving slowly. For example, some large seed companies such as Asia Pacific and CP have enhanced their maize seed marketing strategy. Recently, government has reduced the price of some fertilizers. As a result of these initiatives, it is expected that traders will adopt less unfair means to increase profit.

Banks/MFI policy & practice

Banks: The char farmers do not have the purchasing power or working capital for buying quality seed, fertilizer and insecticides. Therefore, they depend on mainland input sellers who sell these inputs much higher price than the market rate. Farmers sell their product just after harvest to repay the cost of inputs and other loans.. They cannot hold the maize stock for getting prime price. In this context, farmers need

credit support to continue production and achieve sustainable Livelihoods. Bangladesh Bank has directed all public and private banks to provide financial service to these poor farmers. But in practice the banks have high risk perception of chars regarding repayment capacity of the borrowers and lack incentives due to lack of infrastructure (road, transportation, building, electricity, etc.).

NGO/MFIs: Their credit schemes have inappropriate repayment schedules although some of them have already started seasonal loan to meet the requirement poor farmers.

Insecurity of land (leasing)

Marginal farmers usually produce maize as sharecropper or take lease of land from local landlords or influential having control over lands. There are 3 types of land leasing system which are as follows:

System-1: If Land owner share 50% of the cultivation cost, s/he gets half of the share of total crops produced.
System-2: If Land owner do not share cultivation cost, s/he gets 1/3 parts of total crops produced.
System-3: Farmer cultivates lands in agreement with land owner and pay Tk 2000/ *Bigha* (33 decimals of land) for one crop. The lessee farmer stops cultivation if the land owners return back the money after season. Otherwise the farmer will continue production until the land owner return the money back to the farmer.

All these leasing and land use system are operated without any written agreement. As a result, there is no security that the farmers can use the land on long term basis. In fact, policy and practice related to land rights/lease/use allow marginal and small holder farmer to use the land in a limited scale.

Farmer's bargaining power

Char farmers have no organization and therefore unable to bargain with landowners, buyer and inputs suppliers. Weak competition among maize buyers and input suppliers (in some seasons) put farmers in this situation. Informality of land ownership / leasing gives power to land-owners and make poor farmers vulnerable and compel them to accept unfair terms of share-cropping arrangements

Lack of investment in knowledge / extension

Commercial incentives for increasing farm-level productivity are low: As the poor farmers operate with subsistence production capacity, they lack commercial incentives for increasing farm-level production. They sell their limited product to local collectors or primary assembly market just after harvest to repay loans taken for cultivation, buy food and clothes for family members and invest rest of the money to further production.

Buyers (e.g. mills) have more profitable alternative uses for investment capital: Feed mills and food processing companies usually take the advantage seasonal gluts. They send their commission agents to buy maize from the primary assembling markets to build their required stock during the harvesting season. They also buy from local wholesalers in other times to maintain their stock and continue processing. Therefore, they do not see much commercial incentives for increasing farm level production which they think very risky.

Costs of engagement with (individual) farmers are very high. Farmers are not organised and therefore commercial firms or lead firms find it very difficult to engage the individual or scatted farmers in commercial production. Distribution of credit, inputs and collection of produce are not possible for these commercial firms. These firms also have perception/experience of not getting product from the supported individual farmers during harvest.

DAE services are under-resourced and staff lack incentives: As mentioned earlier DAE has not sufficient manpower to provide proper extension service to scattered char farmers.

Farmers lack voice to demand better public extension services: farmers living in the char do not any organisation and therefore unable to demand better public extension services for maize and high value crop cultivation in the char.

Weak public infrastructure (roads, jetties, storage)

Previously limited policy attention to / public investment on chars: For various reason, government and development agencies could not pay attention for long time. Only recently DFID and some national and international NGOs are becoming serious about char development. Public private investment is needed to have more roads, jetties, small scale storage in chars.

Technologies for infrastructure on chars unavailable / too costly: People in char are dependent on primary production technology as because of non- availability of improved technology. Policy attention is needed to overcome this situation.

3.2 Supporting functions

Knowledge Extension (describing the key areas of knowledge needed)

Farmer – to – farmer knowledge sharing: Main source of knowledge for CLP HHs are fellow farmers. The farmers interviewed mentioned that they gather knowledge on maize cultivation by seeing and discussing with nearby farmers. Sometimes, they use own ideas related to cultivation, application of fertilizer, insecticides depending on the conditions of the maize on field. Then, they validate their ideas with other farmers through discussion. They acknowledged that they are not fully aware of seed quality or variety, appropriate fertilizer dose, sowing, spacing, timing of irrigation and management aspect. Farmers need knowledge and information in these areas

Input suppliers – re seeds, fertilizer dosage, input, timing: Farmers use locally available seeds, fertilizers and pesticides imported by large companies.

Seeds: Big seed companies such as CP, Asia Pacific supply maize to retailers in the main land. Farmers buy seeds from these mainland retailers either on credit or cash. The retailers in most cases suggest farmers which seed to buy. They have a strong influence on which brand of seed to promote. Farmers also depend on them as they lack proper information about quality seeds. Sometimes it helps; if the germination rate falls below the 50%, the retailer cannot claim the money from farmer or he will have to compensate farmers who bought seed from him on payment. The seed retailers are also not aware about the quality seed in many cases. So, they try to sell seed for which company offer more commission or margin. They sell one packet (2 kg) of maize seed known as 900 M Gold, 818, & 900 M at Tk 340. He gets Tk 5/pack as commission.

Fertilisers/pesticides: Government enlisted dealers collect fertiliser from nearby government or importers' warehouse. They supply the fertilisers to enlisted sub-dealers or rural retailers. Farmers buy from these retailers. Char farmers buy fertilizer from retailers in the mainland either on credit or cash depending on the situation of the farmers.

Private importers control the whole pesticides import and distribution system. The importers through their representative distribute pesticides to retailers. Farmers buy from them. Quality control is a big issue as different type pesticides are available in the market. Adulteration of pesticides is a common feature in rural areas.

DAE field officers (SAAO): Although there is a provision for SAAO in each ward (administrative unit comprised of 2/3 villages), only one SAAO is now working per union (administrative unit comprised of 10-20 villages). It is not possible for this single SAAO to support all farmers in the area. Government has no policy to encourage private service provider to stay and work at chars or rural areas. The SAAO arrange demonstration for promoting various high value crops among the farmers. In most case they use lead farmers or commercial farmers to collaborate with them. However, farmers in the study area mentioned they are not aware of these demonstrations.

NGO agricultural staff: Many NGOs like SKS, GUK, BRAC have limited training programmes to support farmers. They provide these training mainly to credit borrowers during group meeting. Those who are not members of these NGOs are not benefitting from the NGO run training activities.

Tillage Services

Power tiller services are available in the chars. Large farmers own their own power tiller for cultivation. Smaller farmers purchase tillage service from this farmers or commercial power tiller service providers. The cost for tilling one acre of land is Tk. 1050. In maize cultivation, tillage is required for two times for land preparation. The demand for tillage service is on the rise as farmers are moving away from traditional ploughing. However, the study team was not able to collect any reliable information on the demand, supply and performance of tillage service in the study area.

Irrigation Services

Large farmers own their own irrigation systems. Smaller farmers purchase irrigation services from large farmers or 'water sellers' who have invested in bore-holes and water-pumps. Interview with the water sellers reveal that there are 1000 water seller in the study area.

For farmers, the total cost of irrigating maize is around Tk. 2400 – Tk. 3600 per acre (24%-36% of their total investment depending on the number irrigation purchased). Payments for fuel are made up front, service charges may be deferred until harvest time.

Water sellers invest in shallow bore-holes and water pumps. A typical individual set up covers 5 – 10 hectares of land. There are a growing number of irrigation service providers in the area, and farmers appear to have some choice, and ability to negotiate reasonable prices.

Machine repair / maintenance

Machine repairing and maintenance is a new service in chars. The mechanics or machine repairers provide door step services to farmers. There are 5-7 machine repairers in the study area. Farmers owning power tiller or water pump use their service. The farmers reported that during season these repairers struggle to work on a time schedule to meet all request for proving repair service. This happens because many farmers do not know simple maintenance such as oiling and cleaning after use. They charge Tk. 250/machine excluding any new parts. Each of them repairs 40-50 machines on average in a three month season starts from November to January. During this period, they earn Tk. 13000-15000. They are not formally trained but have 5-8 years of experience while working with urban mechanics as apprentice.

Bicycle transport

Farmers and collectors (*faria*) hire bicycle pullers to transport harvested crops to the jetties / landing points. They pay Tk 20 per 100 kg carried over 1 – 2 km (approx 2% of farm-gate value).

Bicycle pullers are generally young men. Because of poor / absent road surfaces, rickshaws are not usable and bicycles are pushed rather than ridden. This informal transportation contributes to excessive marketing cost.

Boat transport

Farmers and collectors (*faria*) hire boat to transport primary assembling markets. They pay Tk 20 per 100 kg carried over 10 – 20 km (approx 2% of farm-gate value)

Credit for inputs

Government and commercial bank are absent in chars. The poor farmers mostly depend on loans from family, friends and relatives. Share croppers in some cases get supply of inputs in advance and take 2/3 of the harvest. NGOs provide seasonal loan to their group members only.

The assessment team found only two organizations like GUK-Gaibandha and Guano Shasto Kendra are providing seasonal loan for agricultural production in Kunderpara. GSK has a target for distribution of 3 million taka out of which they already have distributed 0.8 million for chili and maize cultivation in the current season. The loan size is minimum Tk. 3000 and maximum Tk. 15000 disbursed at 8% interest rate. Bigger loan are provided in successive years. The total loans have to be repaid within the season after harvest. GSK claims that their repayment rate is 100%. GUK-Gaibandha also provides seasonal loan with 6% interest rate. They have already distributed 2 million taka of which 1 million is for maize and 0.4 million for chili production. But their financial service is limited to their group members only.

Besides, as mentioned earlier, credit is embedded in input supply, irrigation and tillage service. Farmers pay this loan immediate after harvest by selling crops.

3.4 Value-chain analysis

According to Winrock Bangladesh maize report the total maize production in Gabandha Kurigram area is 37000 MT per year. Only over 3000 MT is locally consumed as poultry, fish and cattle feed. About 700 MT is used for human consumption also. The gross profit sharing ratio of the maize value chains is given in the table.

	Profit sharing per MT maize		
Actors	**Cost**	**Revenue**	**Gross profit**
Input sellers	1900	2100	200
Farmers	5000	10000	5000
Foria	10000	10500	500
Trader	11000	12000	1000
Wholesaler	12000	12500	500
Processors	13000	16000	3000

The shows that despite various problem farmers get better price from maize production.

4. Problems and opportunities

Maize drying (processing) is poor – high humidity, limited awareness of issue, lack of technology and knowledge leads to problems with crop storage, aflatoxin, wastage and ultimately lower prices. Underlying problem is lack of farmers' knowledge and engrained traditional practices, combined with insufficient buyer differentiation in prices.

Short-term storage facilities – due to lack of finance and both on farm, and within the market chain (at *haat* / wholesalers) farmers / wholesalers cannot retain crop on their property for longer.

Improvements in yield – **from better quality seeds** (e.g. hybrid) and inputs. Constraints are related to seed supply chains. Main problems are power and influence of seed retailers, and also lack of knowledge

/ information among farmers. But this is being addressed by promotion / competition from quality seed producers in some places.

Knowledge / extension services- can help farmers from lower production and income.

Crop insurance – can protect farmers investments against extreme weather, flooding. But insurance providers do not have a 'presence' on the char, and awareness of product is very low. Opportunity is to embed insurance with micro-finance agri-loans.

Bargaining power. Individual farmers are vulnerable to cartel-behaviour by buyers – especially where selling points / options are few. Farmer organisation, or farmer-organised markets on the chars may be a solution.

5. Vision for a better market system

5.1 Vision of sustainable outcomes

Maize could be an important livelihood diversification option of CLP graduated Char households. Effective agri-services provision based on the char is key. The 'ASP' would offer accurate information and advice (e.g. cultivation practices) to maize farmers for a small fee. The ASP would intermediate with the mainland input suppliers (taking a small margin).

Farmer organisation on a small scale (10 – 20 households) is also important – particularly around bulk purchasing and marketing of produce. Farmers might (informally) organise specially markets.

Access to financial services: seasonal loans, crop insurance would provided by local micro-finance organisations. The ASP might play a role as an agent if seems viable.

5.2 Plausible intervention strategies

Agri-service provider function: Based in the char, able to offer accurate information and advice (e.g. cultivation practices) to maize farmers for a small fee. Intermediary with the mainland input suppliers (taking a small margin).

Farmer organisation – particularly around marketing of produce. Farmer-organised markets (buying days). It should be loose and informally organised. Even as few as 10 – 20 households co-operating can operate this market. This organisation needs capacity building support to scale up their group activities. Long-term technical support is needed to make these groups effective.

Financial services: Seasonal loans, insurance services for agriculture provided by local micro-finance organisations. It is also linked to agri-service providers as agent if possible

6. Conclusion

Maize cultivation is highly profitable in terms of return on investment. Availability of quality inputs and services, improved production technology can help the char farmers to increase production, income and employment opportunities and achieve sustainable livelihoods. Due to lack of drying facility and technology, storage facility, quality inputs, finance and farmers organization char farmers cannot utilize the full potential of maize cultivation. Private agricultural extension service provision, improved technology, crop insurance should be accessible to char farmers. Farmer organized market in char will enable them to bulk up maize and negotiate with external buyers for better price.