

“Effectiveness of Center Led Action Network (CLAN) Purchasing Approach” a Case Study on O&M Materials Purchasing by Gazipur PBS.

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Md. Monowarul Islam Firozi

Abstract

Materials that required keeping the electric distribution system running might be defined as Operation and Maintenance (O&M) materials for RE program. These materials were purchased centrally by REB and then were distributed among the PBSs according to their respective demand against loan. From 2006 The PBSs are entitled to source O&M materials on their own according to policy guideline prescribed in PBS Instruction 100-58. The evaluation of the effectiveness of the hybrid structure of purchasing is the demand of time. The number of materials required for maintaining electric distribution system is very large.

Due to time and financial constraints it was not practical to go for detailed study of effectiveness achieved by all twelve lead PBSs. For this reason we have selected Gazipur Palli Bidyut Samity as our field of our case study.

The objectives of this study are: to identify effectiveness of procurement practices of O&M materials in Gazipur PBS, to identify factors those are affecting procurement practices of O&M materials of Gazipur PBS. It includes quality of materials purchased, scale price economy achieved and improvement of lead time and finally to suggest some recommendations.

Various methodologies like questionnaire survey, focus group discussion, key informant interview etc could be used for research projects. In our study, we went for questionnaire survey. The questionnaire survey was adopted for collecting primary data in this research work. Questionnaire survey was conducted on 4 different level PBS officers of Gazipur Palli Bidyut Samity those who had experience of purchasing O&M materials before and after introduction of the PBS instruction 100-58. They have also experience of lead PBS as well as individual requisitioned PBS. Before asking for filling the questionnaire, the general idea of the research objectives were exchanged with them. After the exchange of general idea of the research objectives, the questionnaire was given to them.

As the cent percent of the targeted population were covered under questionnaire survey the finding of the study is almost concrete and the views of the key officials of Gazipur PBS

reflected the both perspective of PBS Instruction 100-58. During our study it is found that there is a significant difference between the previous procedures of purchasing O&M materials. Eventually both of them has some advantages and disadvantages as well. The quality, price and lead time of the procurement have significantly improved. On the other hand the most crucial issue is that PBSs have to pay for their required materials instantly. As result it has become difficult for financially nonviable PBSs.

The finding of the study reveals that the present process of purchasing O&M materials is a combination of Lead Buyer Approach and Centre Led Action Network (CLAN). The latest instruction and that followed previously are significantly different. There are differences regarding approach of purchasing, processes followed, sources of finance, mode and places of delivery, mode of payment, etc. We also noted the perception of the key respondents that the latest procedure ensures better quality, better price and lead time has also improved.

The disadvantages of the procedure might be attended properly if we could trained the PBSs people properly, delegate more authority to PBSs, create a common O&M fund to provide financial assistance to the insolvent PBSs.

Introduction

1.1 **Background of the study:** - The Bangladesh Rural Electrification (RE) Program was founded with a Presidential Ordinance in October 1977 that established the Rural Electrification Board (REB) as the semi-autonomous government agency reporting to the Ministry of Power Energy and Minerals Resources which was responsible for electrifying rural Bangladesh. Today there are 70 operating rural electric cooperatives called Palli Bidyut Samity (PBS) which bring service to approximately 91,71,142 new connection being made and more than 2,37,101 kilometers of line has been constructed.(<http://www.reb.gov.bd>) This large distribution networks consumes a lot of operation and maintenance (O&M) materials that were purchased centrally by REB and then were distributed among the PBSs according to their respective demand against loan. From 2006 The PBSs are entitled to source O&M materials on their own prescribed in PBS Instruction 100-58. The evaluation of the effectiveness of the hybrid structure of purchasing is the necessity of time.

1.2 **Problem Statement:-** From the inception of Rural Electrification program in Bangladesh, all materials including O&M were being purchased by a Procurement Directorate of Rural Electrification Board (REB). Materials are initially received and kept in three different warehouses at Chittagong, Savar and Khulna. By getting allocation from appropriate authority of REB, PBSs receive O&M materials from any of the above mentioned warehouses against long term loan. It causes some problems like over burden of work pressure on a single Procurement Directorate, problems relating to appropriate demand forecasting resulting shortage or proliferation of stock, huge monetary involvement for large quantity purchase, cutting budget for maintenance by the government and so on. More over, lack of procurement and technical expertise at individual PBS level, shortage working capital and adequate cash flow are added problems to implement the reform. The CLAN approach has been being in effect since 2006. So the study of its effectiveness will obviously add value and improve the O&M materials sourcing practice in PBSs.

1.3 Rationale of the study: - Although this is a very crucial issue for any electricity distributing organization to ensure continuity of supply of O&M materials as and when required for the purpose of reliable supply of power; most of the distributing agencies are serving on almost regional basis except REB and the issue is quite important for the organization in comparison to that of others because of its geographically dispersed distribution network. So the application of CLAN approach for O&M material sourcing was an appropriate decision and it has been practicing by the respective PBSs for more than five years. It is the high time to evaluate the effectiveness of the sourcing reform.

1.4: Research Objectives

The objectives of the study will be as follows: -

- To identify effectiveness of procurement practices of O&M materials in Gazipur PBS.
- To identify factors those are affecting procurement practices of O&M materials of Gazipur PBS. It includes quality of materials purchased, scale price economy achieved and improvement of lead time.
- To suggest some recommendations

1.5: Research Questions

This study intends to know about the effectiveness of CLAN purchasing practices of O&M materials by several PBSs which was previously centralized. The research questions are: -

- Is the CLAN purchasing of O&M Materials by Gazipur PPS is effective?
- What variables are affecting the effectiveness of the present practice?

1.6: Scope and limitations

There are hundreds of materials consumed for O&M purposes by several PBSs. Due to time, financial, informational, academic and resources constraints; the research will be focused on purchasing of O&M materials by Gazipur PBS as case study.

1.7 Organization: - The proposed formation of the report will be as follows:-

Chapter-1: Introduction

1. Background of the study
2. Problem Statement
3. Rationale of the study
4. Research Objectives
5. Research Questions
6. Scope and limitations Limitation of the study
7. Organization

Chapter-2: Literature Review and Conceptual Framework

Chapter-3: Methodology.

Chapter-4: Data Analysis Finding of the Study.

Chapter-5: Conclusion and Recommendation.

2.1) Operation and Maintenance (O&M) Materials :- Operation and Maintenance (O&M) Materials have been defined as all goods and services necessary to transform raw materials and components into end product or final service delivery. It excludes capital expenditures. The number of O&M materials may be very large; some estimates suggest that a reasonably large manufacturing plant will carry in excess of 10000 items in their stock line.

The problem associated with O&M materials are not all to do with expenditure. Potential disruption in production is equally important concern. The price of the item may not be fully reflected in its purchase price. If absence means a production hold-up then it would be more appropriate to measure its value in terms of the additional cost or lost if revenue that might result.

In many cases the actual use of the item will be very low, or zero in some periods. But this does not indicate that the importance of ensuring continuity of supply of O&M items is a useless effort. For example a fault in a particular machine may require some special spare parts. To overcome this situation, the management of stock of O&M materials should be given equal priority. In addition, slow moving stock must be monitored with particular care as this problem is common with O&M items.

Buyers face particular difficulty in respect of O&M supplies used in maintaining equipment and especially in relation to spare parts. The difficulty is that manufacturers of the capital equipment have an obvious interest in binding the purchaser to their own product. While the spare offered by the equipment manufacturer may indeed be the best buy, it does not make commercial sense to accept it without looking at alternatives.

Ideally this problem should be addressed at the earliest stage, namely at the point when the machine is being purchased. Luis Jacobs suggested following checklists for purchasing capital equipments:-

1. Ask for all relevant drawing.
2. Request a list of all parts plus a recommended schedule of spares with expected life spans and other details.
3. Consider linking the price paid to performance levels actually achieved; shortfalls in performance lead to reductions in price.
4. Plan a first purchase of spares at the time of purchasing the equipment. Consider carefully whether the recommendations of the supplier are more than is likely to be required: avoid overstocking.
5. Agree guaranteed lead time for spares if these are to be purchased from the manufacturer.
6. Consider a maintenance agreement with a third party contractor, possibly with the contractor holding stock if spares.

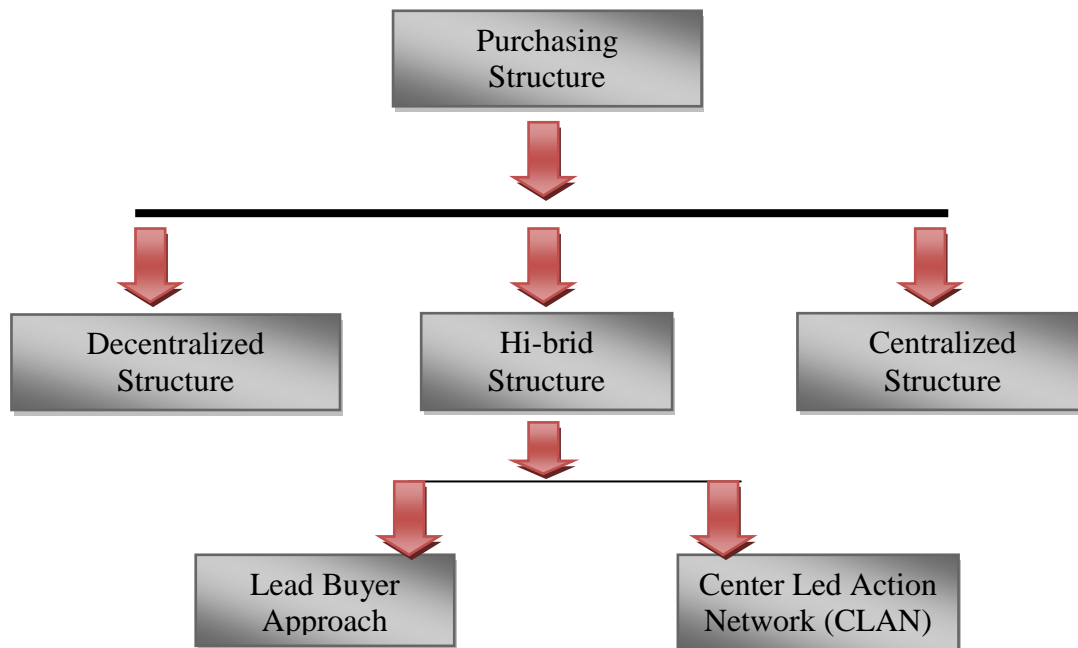
These are very crucial for any power distributing agencies as for example, a very silly item like “fuse link” might cause black out for particular region of the country.

2.2) Effectiveness:- As per the definition of business dictionary effectiveness is [degree](#) to which [objectives](#) are achieved and the extent to which targeted [problems](#) are solved. In contrast to [efficiency](#), effectiveness is determined without [reference](#) to [costs](#) and, whereas efficiency [means](#) "doing the thing [right](#)," effectiveness means "doing the right thing." (<http://www.businessdictionary.com>)

According to dictionary.com; **Effective** is Adequate to accomplish a purpose; producing the intended or expected result. Whereas **efficient** stands for Performing or functioning in the best possible manner with the least waste of time and effort. In other words “*effectiveness is about doing the right things, while being efficient is about doing the things in the right manner.*” (<http://www.dailyblogtips.com>)

2.3) Structure of Purchasing :-The structural formation of purchasing function is dependent on numerous factors, such as, nature of business, availability of required items, elasticity of demand, condition and nature of market and so on. Its liberty of the management to choose the appropriate one that will meet the operational requirement. The available structures of purchasing function most commonly used are as follows: -

Figure: 1, Structure of Purchasing



Let us have a look on the above mentioned structures:-

Centralized Purchasing :- When the purchasing function is entrusted to a single person or a single purchasing department located at the head office of the organization , it is said to be centralized purchasing. It means all purchases are made by the Purchasing Officer /Team. Generally large and medium size organizations accept centralized purchasing.

Let us look into some definitions of centralized purchasing:

A centralized purchasing structure is defined as when “all main purchasing is controlled at one central location for the entire firm” (Leenders and Johnson 2000, 28).

This structure may be described as a situation where a central purchasing department, operating on the strategic and tactical level, is found at a corporate level. This department is often responsible for product specification, supplier selection, contract negotiations and coordination of activities. While the corporation's different business units conduct the operational purchasing activities (Van Weele 2005).

Centralization of purchasing makes it possible to control the resources used and the activities performed at one place in the organization.

At a glance the merits and demerits of centralized purchasing structure are as follows:-

Merits of Centralized Purchasing:

- Centralized purchasing avoids duplication, so buying cost will be less.
- Departments other than purchasing are relieved from the burden of purchasing. As a result of which employees concentrate their mind in own work.
- Transportation cost and carrying cost become economical, because all purchases are made in bulk quantities.
- More trade discount can be availed due to bulk purchase.
- All the records with regard to purchase are kept in one place under the supervision of the purchase officer. It results economy in record management.

Demerits of Centralized Purchasing:

- Delay is caused in centralized purchasing as different departments of different places will send their requirements to the purchasing department. The purchasing department will purchase the necessary items and send to other departments.

- In this case centralized purchasing branches of different places can not take advantages of localized purchasing.
- There are chances of misunderstanding between purchase department and other departments because other departments may not get their requirement according to their own will.
- Centralized purchasing is not suitable in case of perishable commodities.
- It results more cost of transportation and botheration, as it is purchased in one place and send to the distance places.

Decentralized Purchasing: - Decentralized purchasing refers to purchasing materials by all departments and branches independently to fulfill their needs. Such a purchasing occurs when departments and branches purchase separately and individually. Under decentralized purchasing, there is no one purchasing manager who has the right to purchase materials for all departments and divisions. The defects of centralized purchasing can be overcome by decentralized purchasing system. Decentralized purchasing helps to purchase the materials immediately in case of an urgent situation.

Some definitions of decentralized purchasing are quoted below:

A decentralized purchasing structure is defined as when “all main purchasing is controlled at the business units, plants, and/or divisions” (Leenders and Johnson 2000, 28), In other words different business units are responsible for their own purchasing activities.

This structure can be found in companies with a business unit structure, and where the business unit management is responsible for all its purchasing activities (van Weele 2005).

A decentralized purchasing function is also typical for project based businesses. In such a system, the buyers are often responsible for a large variety of products, which are bought in smaller quantities compared to a centralized purchasing function.

Advantages of Decentralized Purchasing

- Materials can be purchased by each department locally as and when required.
- Materials are purchased in right quantity of right quality for each department easily.
- No heavy investment is required initially.
- Purchase orders can be placed quickly.
- The replacement of defective materials takes little time.

Disadvantages of Decentralized Purchasing

- Organization loses the benefit of a bulk purchases.
- Specialized knowledge may be lacking in purchasing staff.
- There is a chance of over and under-purchasing of materials.
- Fewer chances of effective control of materials.
- Lack of proper co-operation and co-ordination among various departments.

Hybrid Structure of Purchasing :- Now a days an important organizational issue is the extent to which purchasing responsibilities should be centralized, i.e. placed in the hands of a single department reporting to a single person. The position is far more complex when multi site operations are in question. Clearly an organization that operates through a number of branches or divisions, perhaps separated by considerable distances may consider the hybrid structuring of its purchasing function. The hybrid concept includes the following structures:-

Center Led Action Network (CLAN) of Purchasing: - Center Led Action Network (CLAN) organizational model was launched in 1991 and is still the approach preferred by

high-performing 'group' companies who want to enjoy the best of two worlds: autonomous business units within the group, and an across-the-group connection which ensures that the whole is greater than the sum of the parts. In the CLAN model, action takes place in the businesses whilst networking between them is driven from the centre.

CLAN's attraction is that it provides a powerful and more stable, yet still flexible, alternative to centralized or de-centralized management of key business functions. This is relatively decentralized model that has become popular in many large organizations. Centre-led action network (Clan) - is an excellent concept, invented and described by Dr Richard Russill and Paul Steele of PMMS. Clan posits a relatively decentralized model, with procurement staff sitting in the different business units in an organization. Their main reporting line is to the local business, with a dotted reporting line to a small procurement "centre", usually sitting in the corporate HQ. Its basic principles are well explained by Peter Smith in *Supply Management* (April 2003 issue)

According to him CLAN model is based on staff located in many different business units. This staff primarily report to local management of their business unit, though have a responsibility to a small procurement center usually located at corporate HQ.

But CLANs are not always the right solution. There are occasions when autocratic top-down leadership is essential, for example in a time of corporate crisis. Likewise it is unlikely to be the right choice in a company that is so intent upon task that it ignores the 'processes' whereby people work together.

Lead Buyer Approach: - Lead buyer approach involves delegating defined purchasing responsibilities onto designated individual within a user department. For example, a member of the manufacturing department is given responsibility for certain purchasing activities.

This has advantage that, the user department is closely involved in purchasing decision; on the other hand the lead buyer is not professional buyer. To make this concept work, it is essential that the purchasing function give appropriate support to the lead buyer. If this is

successful, the benefit is better communication and improved relations between purchasing and user department.

2.3) Procurement Practices of O&M materials in Rural Electrification Board (REB)

and Palli Bidyut Samities:- A procurement directorate under the board was engaged with procuring various types of materials and equipments to facilitate Rural Electrification (RE) program centrally against development projects of the government as well as O&M purpose. After the approval of PBS Instruction 100-58, the board delegated the purchasing of O&M materials to a great extent to the user PBSs subject to close monitoring. Initially the PBSs were allowed to source O&M materials either individually or in nine groups led by Dhaka PBS-1, Gazipur PBS, Chittagong PBS-1, Gopalganj PBS, Natore PBS-1, Jessore PBS-1, Barishal PBS-1, Moulvibazar PBS, Rangpur PBS-2.

The instruction series also provide that the nine separate Lead PBSs will accomplish the procurement function on behalf of each group that will be nominated at the beginning of each fiscal year by the following committee:-

1. Member PBS & Training REB – Convener.
2. Chief Engineer (P&O) –Member
3. Controller (Accounts & Finance) – Member
4. Executive Director- Member Secretary.

So the Lead PBS may be changed depending on their performance or any other factors that are considered relevant to the committee.

Each PBS will assess the requirement of O&M materials in a prescribed form and also get approval of concern PBS board. In addition, it should be confirmed about the sources of finance for this purpose. The following sources will be utilized for purchasing O&M materials: -

1. Money collected against Meter Rent.

2. Replacement Reserve Fund.
3. Non Operating Income (Interest).
4. Other Non Operating Income.
5. Loan from REB/PBSs or other Sources.

Subsequently the PBS management will send the requisition to concern lead PBS along with money. It should be noted that the copy of the same must be sent to three different directorate of REB for information.

There is an amendment to this instruction where the group of PBSs for the purpose of purchasing O&M materials increased from nine to twelve. There are also corrections regarding process of determining estimated costs, tender document finalization, advertisement procedures, and tender evaluation committee in the same letter.

According to the latest direction issued by REB shows that the number of lead PBSs is 13 and it is the mixture of zonal and itemize for the whole Bangladesh. This concept is not appropriately related to the spirit of decentralization.

In case of group purchase, supplier will deliver the goods to individual PBSs. After receiving the same each PBS will issue receiving reports (RR). It must be submitted to the lead PBS with the bill for payment. All specifications of materials must be either approved by REB or certified by the MPSS Directorate of REB. Inspection and Testing Directorate of REB is responsible for conducting pre and post shipment inspection to ensure conformance with specification and quality of the goods as well.

The estimated price of each tender package will be calculated on the basis of rate approved by REB or rate certified by the Procurement Directorate of the same board.

REB will provide sample tender document to the lead PBSs. The concern lead PBS should prepare draft tender document according to its requirement. The PBS board will approve draft document primarily. Subsequently the draft tender document must be placed before a committee comprising of the following members:-

1. Member (PBS and Training) REB –Convener.
2. Director, PBS Development and Management Directorate, REB, Concern Zone REB – Member Secretary.
3. Director, MPSS Directorate, REB, – Member.
4. Director, Procurement Directorate, REB, REB – Member.
5. Director, Finance Directorate, REB, Concern Zone REB – Member.
6. General Manager (Lead PBS)- Member.

In case of group purchase, all purchasing expenses will be distributed among the PBSs equally.

The formation of tender evaluation committee will include the following members: -

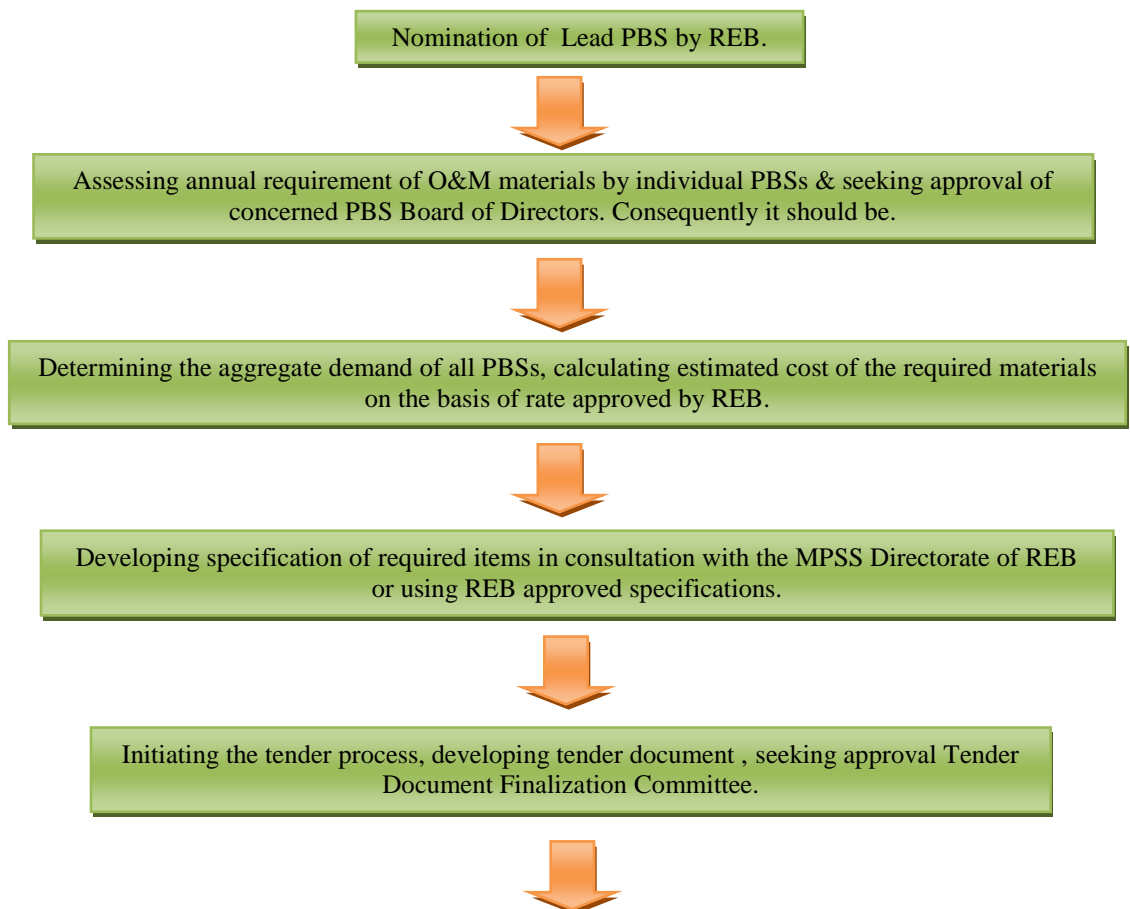
1. General Manager- Lead PBS- Convener.
2. Executive Engineer, Concern Project Division, REB- Member.
3. Executive Engineer, Directorate of System Operation, REB- Member.
4. Deputy General Manager, Another PBS of the group- Member’
5. Assistant General Manager (General Service), Lead PBS –Member Secretary.
6. External members other than the Ministry of Energy Power and Mineral Resources, at least two members.

Besides evaluation committee might seek assistance of REB for technical evaluation or commercial evaluation. Chairman REB or any permanent member of the board will nominate such personnel to help upon the request from the TEC.

After receiving the demand of individual PBSs; the lead PBS will immediately determine the total requirement and initiate purchasing process. After the evaluation of Tender Evaluation Committee (TEC); the evaluation report with clear recommendation will be placed before the PBS board and after reaching consensus it will make a proposal with recommendation to seek approval of REB. The lead PBS will send the evaluation report along with the minute of PBS board meeting to concern Management and Operation Directorate of REB. After preparing all working papers; concern Management and Operation Directorate will place the issue before the RFB board meeting. The approval or disapproval also will be informed immediately after the meeting. The lead PBS will issue letter of intent and subsequently sign contract with the supplier after getting such approval. (REB Instruction 500-27 & PBS Instruction 100-58)

The key steps involved relating to source O&M materials by PBSs as per PBS instruction 100-58 are represented in the following flow chart:

Figure-2, Flow chart of O&M materials purchasing by PBSs



Receiving tenders, Evaluation by Tender Evaluation Committee, making Board Proposal by Lead PBS on the basis of the recommendation of the TEC. PBS management will send the the evaluation report along with the minute of PBS board meeting to concern Management and Operation Directorate of REB.



Concerned Management and Operation Directorate of REB is responsible to place the proceeding before the REB board for approval. It will also inform the lead PBS about the decision made by the board.



Awarding contract, Contract management and maintaining liaison with the Inspection and Testing Directorate of REB for pre as well as post shipment inspection.



After the completion of delivery in full on time, lead PBS will make payment on behalf of all PBSs subject to the submission of receiving report issued by individual PBSs with the invoice

According to the definition of Merriam Webster dictionary, methodology is a body of [methods](#), rules, and postulates employed by a discipline: a particular procedure or set of procedures. In other word methodology is the analysis of the principles or procedures of inquiry in a particular field.

According to Wikipedia, A methodology is usually a guideline system for solving a problem, with specific components such as phases, tasks, methods, techniques and tools. It can also be defined also as follows:

1. "the analysis of the principles of methods, rules, and postulates employed by a discipline";
2. "the systematic study of methods that are, can be, or have been applied within a discipline";
3. "the study or description of methods".

A methodology can be considered to include multiple methods, each as applied to various facets of the whole scope of the methodology. Generally speaking, methodology does not describe specific methods despite the attention given to the nature and kinds of processes to be followed in a given procedure or in attaining an objective.

There are several possible methods that may be applied by researchers in order to solve a stated problem situation. In general there are two distinct types of methods that may be applied: qualitative or quantitative (Dubois and Araujo 2007). The quantitative methods include simulations and model building as well as statistical testing of survey data (Ellram 1996). This method is well suited in situations where the researchers are searching for generalities and patterns in collected data (Dubois and Araujo 2007). The qualitative method is an umbrella concept covering several forms of inquiry that helps to understand and explain the meaning of a phenomenon (Merriam 1998).

3.1) Methods of collecting data

The questionnaire survey was adopted for collecting primary data in this research work. Questionnaire survey was conducted on 4 different level PBS officers of Gazipur Palli Bidyut Samity those who had experience of purchasing O&M materials before and after introduction of the PBS instruction 100-58. They have also experience of lead PBS as well as individual requisitioned PBS. Before asking for filling the questionnaire, the general idea of the research objectives were exchanged with them. After the exchange of general idea of the research objectives, the questionnaire was given to them.

They were requested to fill the questionnaire based on the practical experience they had regarding the implementation of the new policy guide line of purchasing O&M materials for PBSs. Both open end and close end questions were set in the questionnaire to reveal the real perception of the respondents. They were asked to give their perception regarding the impact PBS instruction 100-58 on the 3 KPIs i.e. quality of products, scale of price economy achieved and improvement of leads time.

3.2) Sample size and other relevant information

The sample size for this study was determined to be 4 as the scope and time frame of the study was limited and we consider the case study of a single PBS. Among employees involved in the managerial functions; three Assistant General Managers and the General Manager of the organization are considered as key personnel for procurements. As the sample size is small and within the reach of the researcher; 100% if the informants were covered under the survey.

3.3) Place of study and study period

Survey was conducted at Gazipur Palli Bidyut Samity head quarter at gazipur, Dhaka, Bangladesh on 11 August 2012.

3.4) Analysis tools used

Collected data have been cleaned, edited, and re-arranged for analysis and drawing a conclusion. No statistical analysis has been used as 100% of the sample is covered under the questionnaire survey. Microsoft Excel has been used for preparing tables; for calculation and for constructing pie charts. Microsoft Word has been used for preparing the report.

The purpose of this study is to find out the effectiveness of present practice of purchasing O&M materials after enactment of PBS Instruction 100-58. More specifically, the main purpose of this study is to assess the impact of the PBS Instruction 100-58 on the procurement key performance parameters- quality, total cost and lead time of O&M materials. The main research question of this study is the extent to which present procurement practice to source O&M materials is effective.

A case study has been conducted on Gazipur Palli Bidyut Samity. For this purpose, questionnaire survey has been conducted on the officers of the focused PBS who have practical experience of purchasing O&M materials according to PBS Instruction 100-58. The respondents include, General Manager, Assistant General Manager (General Service), Assistant General Manager (Engineering), Assistant General Manager (Finance) of Gazipur Palli Bidyut Samity. In addition to the questionnaire survey, Key Informant Interview has been conducted. In this regard, 4 senior officers of the organization have been interviewed.

4.1 General information about sample of the questionnaire survey

Sample size: 4 (Number of persons surveyed)

Designation: 1 (one) General Manager and 3 (three) Assistant General Managers from different departments

Work experience: Between 10 to 20 years -3 persons.

Between 20 to 30 years-1 person.

4.2 Overview of the survey questions

To get the perception of the respondents regarding the effectiveness of the CLAN procurement structure according to PBS Instruction 100-58, 10 questions have been asked under four broad categories. It includes both open and close questions and also covers all relevant area of this dissertation. The first three questions are asked to seek qualitative aspects of the study such as comparisons of present and previous procedures, point of distinctions, pros and cons of the newly implemented approach etc. The fourth and final question is all about the quantitative aspects. It covers the quality of procured materials, scale economy achieved, improvement of lead time and overall

effectiveness of procedure. The first and last questions include three and five sub-questions respectively while question numbers 2 and 3 are complete in nature and require no supplementary enquiries.

Distribution of responses and percentage of responses for these questions are presented in table following orders:

Question Numbers	Covered KPIs	Respective Table Numbers	Remarks
4(a)	Quality of Materials	A#1	
4(c)	Scale of Economy Achieved	A#2	
4(d)	Improvement of lead time	A#3	
4(e)	Overall effectiveness of the process	A#4	

Frequency distributions of the responses are demonstrated in pie charts which are presented in [Appendix-D](#).

4.3 Findings of the questionnaire survey

Findings of the survey are described below under three broad headings:

4.3.1 Regarding the Comparisons of Present O&M procurement Practices:

The first question was all about a comparisons of the procedures before and after implementing the CLAN approach of purchasing O&M materials ie PBS Instruction 100-58.

Question 1 (a) : Would you please mention, past and present procedure of sourcing O&M materials by your PBS ?

In response to the above mentioned question, the respondents have given following opinions:-

At the inception of RE program in Bangladesh, The executive engineers from several numbers of projects raised requisitions of materials for maintenance of distribution systems. These rules were slightly deviated and REB purchased materials for O&M purpose and kept them at any one or all of

its warehouses at Khulna, Chittagong and Savar-Dhaka. Subsequently materials were distributed among PBSs according to their requisition or some times on the basis of perception of REB against long term loan. In most of the cases REB delivered materials through its own carrying contractors to the PBSs. In case of emergency situations concern PBSs have to take the responsibility of transporting the required materials.

On the other hand, from 2006; after the implementation of PBS instruction 100-58 ***“Instruction of Purchasing Operation and Maintenance (O&M) Materials by Palli Bidyut Samities (PBSs)”***- REB selects a certain number of lead PBSs to purchase O&M materials. These lead PBSs are responsible for purchasing required materials for maintenance purpose on behalf of seventy PBSs of the country. The lead PBSs are evaluated and selected by a committee specified by the instruction. At present the number of lead PBSs are twelve.

4.3.2 Regarding the distinction between two procedures of purchasing O&M materials:

All respondents are agreed about some common points of distinctions. This was a closed question providing the respondents only two options. Either they have to agree or disagree.

Question 1 (b) : Do you find any distinction between past and present procedure ? (Please tick the right answer) **Ans : Yes/No**

All respondents i.e. 100% are agreed that there are some vital differences between the present and previous practice of purchasing O&M materials.

4.3.3 Regarding the differences between before and after implementation of PBS Instruction 100-58:

This was another open question for the respondents to express their opinions independently.

Question 1 (c) : If yes, please state main points of distinction.

Wide range and interesting responses are available from them. At a glance, the differences are represented in the following table:

Points of differences	Previous procedure (before implementing PBS instruction 100-58)	Present procedure (after implementing PBS instruction 100-58)
Basis of purchasing	At the very beginning the process was demand pulled. Afterwards it has been deviated and a lot of unnecessary materials were purchased on the basis of imposed demand created factiously by REB.	According to PBS instruction 100-58, purchasing initiative is started on the basis of individual PBSs requirements. So this procedure is fully demand pulled process of purchasing.
Complexity of getting materials	This process was relatively complex to get materials by the PBSs as the supply chain is comparatively long and more parties are involved.	PBSs can get required materials more easily than the previous practice as the supply chain has eliminated some unnecessary hubs.
Financing	The fund was being provided by REB from the annual development projects of the government. Concern PBSs have to reimburse their proportionate amount along with interests over long period of time.	<p>Concerns PBSs could utilize money from the following sources:-</p> <ol style="list-style-type: none"> 1. Money collected against Meter Rent. 2. Replacement Reserve Fund. 3. Non Operating Income (Interest). 4. Other Non Operating Income. 5. Loan from REB/PBSs or other Sources. <p>So they have to spend money before or at least at the time of taking delivery of the materials.</p>
Tendering and approving authority	Procurement directorate of REB was responsible for all purchasing activities and final approving authority is also within the same organization.	Tendering authority are concern lead PBSs but all approving authority lies with REB.
Procurement cycle time	The previous purchasing cycle time was comparatively long and time consuming.	Purchasing cycle consumes relatively less time according to the new instruction.

Involvement of PBS management	The main operational human resources of RE program; PBS management was out of consideration during the procurement procedure.	The PBS management are at driving position while purchasing O&M materials according to new procedure.
Place of delivery	In most of the cases suppliers delivered goods centrally to any warehouse as specified by REB in the contract documents.	Suppliers are dictated to deliver goods to individual PBSs according to the instruction that must have to be included in the tender documents.

4.3.3 Regarding advantages of implementing PBS Instruction 100-58:

Another qualitative question was asked to the respondents to mention the pros or advantages. It was also another open to them and they mentioned the issues in light of their experiences. The question actually was:

Question 2: Would you please state remarkable advantages of present procedure of purchasing O&M materials?

Respondents summarized numerous advantages of the CLAN approach. Some of them are overlapping. Most common advantages mentioned by them are as follows:

It has become easier to make materials available as and when needed. All PBSs have to determine the requirement of materials well ahead of starting the fiscal year. They also required making budget provision and also having to being confirmed about the sources of finance. After this the individual PBSs inform their respective demand to the designated lead PBSs. So the concerned lead PBS will follow the requirement and if the demand forecasting is accurate generally it will get the material within the stipulated time.

According to his process PBSs need not to send their requirement either project division of REB or to the REB head quarter. If demand is justified and fund is available then PBS can raise requisition independently. As a result the whole process consumes less time than that of the previous procedure.

PBSs are main distribution network operating and maintaining wing of REB. As a result the PBS people pose more practical experiences regarding the performance of any items consumed by the system. As per PBS instruction 100-58, PBS people are now included in inspection and testing teams which help to ensure appropriate quality of materials.

The present procedure is cost effective. Because it accumulates the requirement of several PBSs that ensure economies of scale, reduces tender processing cost, avoid double carrying charges as the suppliers deliver goods at concern PBS's premises.

All PBSs are aware of slow moving and dead items. As the operational level is responsible for raising demand eventually they would take the historical movement of the items into consideration.

The process must have to follow PPR 2008; it helps to ensure more accountability and transparency.

4.3.4 Regarding advantages of implementing PBS Instruction 100-58:

<p>Question 3: Would you please state remarkable weaknesses of present procedure of purchasing O&M materials?</p>
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The respondents also mentioned their views regarding the disadvantages of implementing the new procedure. Almost everybody has mentioned that the major disadvantage is PBSs have to pay for the materials instantly at the time of receiving goods. Definitely this is a great problem as major number of PBSs has yet not achieved the financial breakeven point. Moreover they are running with shortage of working capital. In addition several hike of bulk tariff were not accommodated by subsequent price adjustment at distribution level. So the opportunity cost of purchasing materials also remarkably high.

All procurement activities under PBS instruction 100-58 must be conducted under following PPR 2008 and PPA 2006. Unfortunately these processes are not well practiced among PBS's people as the any other regular purchasing are completed by following PBS Instruction 300-36 " Procurement Procedure for the PBS" which is totally different. As a result there is a lack of expertise among key personnel.

Any successful purchasing is greatly dependent upon the quality of specification included in the bid document. PBS people have to depend on REB developing specification because of the restriction prescribed in the policy. In addition they are not competent enough to develop specification. These restrictions are also barrier to self development of interested people.

Demand forecasting always plays vital role in inventory management. Sometimes individual PBSs do not pay adequate attention at the time of forecasting. This is not also an easy task to guess about required maintenance of distribution system in advance. But they must have to pay attention while planning preventive maintenance.

Independent lead PBSs don't have any testing facilities of purchased materials. For these activities they have to depend on Inspection and Testing Directorate of REB.

A large numbers of PBSs are financially insolvent but O&M materials are equally important for keeping the operation smooth. Due to shortage of fund; it has become very difficult for this kinds of PBSs to ensure the continuity of supply.

4.3.5 Regarding quality of materials purchased by following PBS Instruction 100-58:

This is the first component of judging the effectiveness of the newly implemented procurement policy to source O&M materials used by the PBSs. The question was:-

<p>Question 4: (a) Please mention extent to which the “<i>quality</i>” of procured materials improved by following the hi-brid approach of procurement.</p>
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The responses were given a scale from 1 to 5; 1= Significantly Deteriorated, 2= Deteriorated, 3= Same as it was before, 4= Improved, 5= Significantly Improved.

This is question has been asked to get the perception of the respondents regarding the impact of PBS instruction 100-58 on the quality of materials purchased. For this question, 25% respondents perceive that PBS instruction 100-58 has not played any role on quality i.e. it same as it was before. Whereas 50% perceive as quality of materials has improved and remaining 50% perceive as the quality of purchased materials has significantly improved.

From the responses of this question, it is seen that majority of respondents have given their views that rules regarding rules regarding CLAN approach has a positive impact on quality of goods purchased. The analysis of this entire question are demonstrated in a table appendix-A.

4.3.6 Regarding the extent to which the price has been reduced or scale of economy achieved:

This was a closed-ended question having only two choices for the respondents and in response 100% of them agreed that the PBSs are able to ensure better price of O&M materials through present procurement practices

Question 4: (b) Do you think the PBSs ensure better “*price*” of O&M materials through present procurement practices? (Please put tick mark) **Ans : Yes /No**

On the basis of response a supplementary question was asked requesting to specify the scale of economy ensured within scale from 1 to 5. The question was actually:

Question 4: (c) If the answer of question no 4(b) is yes; please specify the scale of economy:

The scales specified to response were 1= Significantly Expensive, 2= Expensive, 3= Same as before, 4= Economical, 5= Significantly Economical.

Nobody has perceived the new process is expensive or significantly expensive. On an average, 25% respondents perceive that PBS instruction 100-58 has no impact on price i.e. it same as it was before. Whereas 25% perceive as price of materials is economical and remaining 50% perceive as the quality of purchased materials has significantly economical. From the responses of this question, it is seen that majority of respondents have given their views that rules regarding rules regarding CLAN approach has a positive impact on price of

goods purchased. The responses of this entire question are demonstrated in a table appendix-A.

4.3.7 Regarding the extent to which the lead time has been reduced:

The amount of time that elapses between when a process starts and when it is completed. Lead time is examined closely in manufacturing, supply chain management and project management, as companies want to reduce the amount of time it takes to deliver products to the market. In business, lead time minimization is normally preferred.

Again the question was asked to quantify whether and to what extent the lead time of sourcing O&M materials has been reduced.

Question 4: (d) Please specify extent to which extent to which the “*lead time*” of delivering materials improved.

Everybody is agreed that in no ways the new approach have any adverse impact on lead time. Fifty percent of the respondents perceived that lead time has remained unchanged and PBSs are getting their required materials almost at same lead time delay. Twenty five percent of the respondents perceived that the lead time situation has improved while other twenty five percent are more satisfied about the lead time and the mentioned that the situation has significantly improved. We also tried to demonstrate the responses if form of pie chart in Appendix-D.

4.3.7 Regarding the overall effectiveness of implementing PBS instruction 100-58 i.e. the CLAN approach of purchasing O&M materials:

This question is designed to seek the opinion of the key respondents about the overall effectiveness of the new process of procurement implemented by the PBSs under the policy guide line issued by REB in form of PBS instruction 100-58.

Question 4: (e) How effective the present procedure is ? (please tick the appropriate box)

These responses represent the insights of participating respondents regarding the new approach and responses are distributed for them in six different scales i.e. 1= very poor, 2= poor, 3= acceptable, 4= good, 5= very Good, 6= excellent. In this case again we have gotten the responses distributed from 4 to 6. Twenty five percent of the respondents have ranked the new process as good while fifty percent ranked it as very good and twenty five percent perceived it as excellent.

4.4. Analysis of findings from the questionnaire survey:

Gazipur Palli Bidyut Samity is one of the largest, successful and financially solvent Rural Cooperative in Bangladesh. It was nominated as lead PBS for purchasing O&M materials during the financial year 2006-07 to 2009-10. At present it is sourcing their required materials by other PBS that are nominated as lead PBS. So the respondents pose vast experience as lead PBS as well as individual PBS. For this reason this organization was selected as a field of our case study so that we can get responses from both perspectives within stipulated time of the research. Cent percent of the sample relating to the case study were surveyed so we are not depending on or actually required to depend on any kind of statistical analysis. The analysis of the survey finding is straight forward and they are as follows:-

4.4.1 Comparison of previous and present Procedure: It should be noted that all respondents i.e. 100% are agreed that there are some vital differences between the present and previous practice of purchasing O&M materials. So it is very clear that there are some remarkable fundamental and procedural differences between these two processes. The remarkable differences are:

- The present procurement initiative is more demand driven. It starts after achieving the demand from individual PBSs in a specified form.
- PBS could get required materials more easily.
- The procurement is financed from PBS's own fund.
- The tendering and contracting authority is delegated to lead PBSs but REB is still the final authority to approve or disapprove a tender.
- The procurement cycle time is comparatively shorter.

- PBS managements are involved in procurement process more proactively.
- The suppliers ensure the delivery of goods to concerned demanding PBSs.

4.4.2 Pros and cons of implementing PBS instruction 100-58

Definitely every procedure poses its own pros and cons. It is a pre-requisite to analyze and consider each and every of them carefully before assessing effectiveness of the changed process.

Respondents summarized numerous advantages of the CLAN approach. Some of them are overlapping. Most common advantages mentioned by them are as follows:

It has become easier to make materials available as and when needed. All PBSs have to determine the requirement of materials well ahead of starting the fiscal year. They also required making budget provision and also having to be confirmed about the sources of finance. After this the individual PBSs inform their respective demand to the designated lead PBSs. So the concerned lead PBS will follow the requirement and if the demand forecasting is accurate generally it will get the material within the stipulated time.

According to this process PBSs need not send their requirement either project division of REB or to the REB head quarter. If demand is justified and fund is available then PBS can raise requisition independently. As a result the whole process consumes less time than that of the previous procedure.

PBSs are main distribution network operating and maintaining wing of REB. As a result the PBS people pose more practical experiences regarding the performance of any items consumed by the system. As per PBS instruction 100-58, PBS people are now included in inspection and testing teams which help to ensure appropriate quality of materials.

The present procedure is cost effective. Because it accumulate the requirement of several PBSs that ensure economies of scale, reduces tender processing cost, avoid double carrying charges as the suppliers deliver goods at concern PBS's premises.

All PBSs are aware of slow moving and dead items. As the operational level is responsible for raising demand eventually they would take the historical movement of the items into consideration.

The process must have to follow PPR 2008; it helps to ensure more accountability and transparency.

The respondents also mentioned the disadvantages of implementing the new procedure. Almost everybody has mentioned that the major disadvantage is PBSs have to pay for the materials instantly at the time of receiving goods. Definitely this is a great problem as major number of PBSs has yet not achieved the financial breakeven point. Moreover they are running with shortage of working capital. In addition several hike of bulk tariff were not accommodated by subsequent price adjustment at distribution level. So the opportunity cost of purchasing materials also remarkably high.

All procurement activities under PBS instruction 100-58 must be conducted under following PPR 2008 and PPA 2006. Unfortunately these processes are not well practiced among PBS's people as the any other regular purchasing are completed by following PBS Instruction 300-36 " Procurement Procedure for the PBS" which is totally different. As a result there is a lack of expertise among key personnel.

Any successful purchasing is greatly dependent upon the quality of specification included in the bid document. PBS people have to depend on REB developing specification because of the restriction prescribed in the policy. In addition they are not competent enough to develop specification. These restrictions are also barrier to self development of interested people.

Demand forecasting always plays vital role in inventory management. Sometimes individual PBSs do not pay adequate attention at the time of forecasting. This is not also an easy task to guess about required maintenance of distribution system in advance. But they must have to pay attention while planning preventive maintenance.

Independent lead PBSs don't have any testing facilities of purchased materials. For these activities they have to depend on Inspection and Testing Directorate of REB.

A large numbers of PBSs are financially insolvent but O&M materials are equally important for keeping the operation smooth. Due to shortage of fund; it has become very difficult for these kinds of PBSs to ensure the continuity of supply.

4.4.3 Quality issues of CLAN approach

Quality of goods or services is the degree extent to which it is fit for the purpose. In other word how much it has satisfied the utility of consumer or user. Twenty five percent of the respondents perceive that PBS instruction 100-58 has not played any role on quality i.e. it same as it was before. Whereas fifty percent perceive that quality of materials has improved and remaining twenty five percent perceive as the quality of purchased materials has significantly improved.

So it is mandated that the implementation of PBS Instruction 100-58 has a positive impact on the quality of goods purchased.

4.4.4 Impact on price of overall purchase:

Appropriate quality at an affordable price is an ideal situation in procurement. An air trip to Chittagong is always a very comfortable journey but it might not be affordable. So the price was another important consideration of our study and 25% respondents perceive that PBS instruction 100-58 has no impact on price i.e. it same as it was before. Whereas 25% perceive as price of materials is economical and remaining 50% perceive as the price of purchased materials has significantly economical. So it is clear that the rules regarding rules regarding CLAN approach has a positive impact on price of goods purchased.

4.4.5 Impact on lead time:-

Lead time is the time required from start to completion of particular process or activity. Fifty percent of the respondents perceived that lead time has remained unchanged and PBSs are getting their required materials almost at same lead time delay. Twenty five percent of the respondents perceived that the lead time situation has improved while other twenty five percent are more satisfied about the lead time and the mentioned that the situation has

significantly improved. The finding reveals that the overall lead time is improved remarkably.

4.4.6 Overall impact of the new approach:-

The final question to the respondents was about the overall effectiveness of the system implemented in light of the PBS Instruction 100-58. These responses represent the insights of participating respondents regarding the new approach and responses are distributed for them in six different scales from 1 to 6. In this case we have gotten the responses distributed from 4 to 6. Twenty five percent of the respondents have ranked the new process as good while fifty percent ranked it as very good and twenty five percent perceived it as excellent. So it is found that the new process of purchasing O&M materials is quite effective.

4.5 Summary of key findings

As the cent percent of the targeted population were covered under questionnaire survey the finding of the study is almost concrete and the views of the key officials of Gazipur PBS reflected the both perspective of PBS Instruction 100-58. During our study it is found that there is a significant difference between the previous procedures of purchasing O&M materials. Eventually both of them has some advantages and disadvantages as well. The quality, price and lead time of the procurement have significantly improved. On the other hand the most crucial issue is that PBSs have to pay for their required materials instantly as result it has become difficult for financially nonviable PBSs.

Conclusions and recommendations

5.1 Conclusion:

Based on the literature review, analysis and questionnaire survey, following conclusions are drawn regarding the impact and effectiveness of the implementation PBS Instruction 100-58 for purchasing O&M materials to ensure the continuity of supply and to keep the distribution system running:

- The PBS instruction 100-58 is the combination of Lead Buyer Approach and Centre Led Action Network (CLAN). Nominated lead PBSs accomplish the purchasing activities on behalf of all or group of PBSs which basically the concept of lead buyer approaches. On the other hand the lead PBSs are not independent enough to take any kinds of decisions and they also controlled and monitored centrally by REB. Moreover they are bound to report all necessary information and progress relating to any procurement process as mentioned in the policy guide line which is the basic characteristics of CLAN approach.
- The process of providing O&M materials to PBSs according to the latest instruction and that followed previously are significantly different. There are differences regarding approach of purchasing, processes followed, sources of finance, mode and places of delivery, mode of payment, etc.
- The study reveals that the combined approach of purchasing O&M materials prescribed by the PBS Instruction 100-58 has remarkably improved the quality of purchased materials.
- It has ensured better price of the purchased materials. In addition it helps to reduce the tender processing cost as well as it make a purchase for a group of PBSs.

- The PBSs are getting O&M materials easily because they can initiate purchasing process after reviewing their individual stock position before starting a financial year. As a result the lead time has also improved.
- Both lead PBS's and individual PBS's perception are almost same that overall effectiveness of the latest process is satisfactory.
- According to new process PBSs have to make payment at once at the time of purchasing that creates an additional burden on its working capital position. Especially financially nonviable PNSs are in great trouble as they don't have enough money to afford it.
- Till the approval process is bureaucratic and there is good chance to ease the process that will ultimately facilitate the reduction of procurement cycle time.
- The PBSs are facing lack expertise in conducting purchasing process according to PPR-2008.
- Lack of systematic demand forecasting tools that leads to inappropriate requisition.

So we can conclude that although the implementation PBS Instruction 100-58 has effectively improve the security of supply of O&M materials but, there are many scope of improvement in this regard.

5.2 Recommendations

It is seen from the study that PBS Instruction 100-58 has significant positive impact on the quality of goods total, price of the materials purchased, lead time and overall effectiveness of purchasing O&M materials used by the PBSs. For further improvement, following recommendations are drawn based on the study:

- ✓ Necessary expertise of PPA- 2006 and PPR-2008 is a pre requisite to procuring materials according to PBS Instruction 100-58. Unfortunately PBS's officials have a little opportunity to exercise these policies as they are conducting any other requirements as per policy guide line of PBS Instruction 300-36. So a detailed

Training Need Analysis (TNA) is to be conducted and subsequently they should be trained to get better results.

- ✓ The approval process should be easier and more delegation of authority to the lead PBSs will ultimately reduce the procurement cycle time.
- ✓ Financially insolvent PBSs are suffering from shortage of supply to keep their distribution system smoothly running due to shortage of fund. In some cases this situation causing more risk for the incumbent PBSs. A combined O&M fund should be created by contributing a nominal amount of money by all PBSs initially. Financially solvent PBSs might invest their surplus fund to that fund as their contribution in state of invest it with banks or other financial institutions. Insolvent PBSs may borrow from that fund only to finance O&M materials procurement. Contributing PBSs might entitle to get interest on their investment to the fund. On the other hand the borrowing PBSs will get their required materials on medium term loan from that fund at a convenient rate of interests.
- ✓ REB as controlling agency should formulate a uniform procedure of forecasting O&M materials demand. All PBSs should follow it and it will help to avoid inaccurate demand forecasting.

Appendix-A Tables

Distribution of responses for question nos 4(a), 4(c), 4(d) & 4(e)

Question 4: (a) Please mention extent to which the “*quality*” of procured materials improved by following the hi-brid approach of procurement.

(Table # A-1)

Question No	Frequency					Total Frequency
	Significantly Deteriorated	Deteriorated	Same as before	Improved	Significantly Improved	
4: (a)	0	0	1	2	1	4
Percentage	0	0	25	50	25	100

Question 4: (c) If the answer of question no 4(b) is yes; please specify the scale of economy:

(Table # A-2)

Question No	Frequency					Total Frequency
	Significantly Expensive	Expensive	Same as before	Economical	Significantly Economical	
4: (c)	0	0	1	1	2	4
Percentage	0	0	25	25	50	100

Question 4: (d) Please specify extent to which extent to which the “*lead time*” of delivering materials improved.

(Table # A-3)

Question No	Frequency					Total Frequency
	Significantly Deteriorated	Deteriorated	Same as before	Improved	Significantly Improved	
4: (d)	0	0	2	1	1	4
Percentage	0	0	50	25	25	100

Question 4: (e) How effective the present procedure is ? (please tick the appropriate box)

(Table # A-4)

Question No	Frequency						Total Frequency
	Very Poor	poor	Acceptable	Good	Very Good	Excellent	
4: (e)	0	0	0	1	2	1	4
Percentage	0	0	0	25	50	25	100

Appendix-B Sample Questionnaires

Institute of Governance Studies, BRACU

&

Chartered Institute of Purchasing and Supply (CIPS), UK

Thesis topic: “ **Effectiveness of Centre Led Action Network (CLAN) Purchasing Approach:
A Case Study of O&M Materials Purchasing in Gazipur PBS.**”

Questionnaire for The General Manager

[This research proposal is just for BRACU & CIPS requirement as a part of academic discipline of Masters Degree. This survey questionnaire is prepared for obtaining opinion relating to the effectiveness present CLAN procurement practice applicable for sourcing O&M Materials used by PBSs.]

Part A: Demographic Information

- 1. Length of Service:**
- 2. Age:**
- 3. Sex:-**
- 4. Last Academic Degree:**

Part B: Questionnaires

The following questions deals with the present practice of sourcing O&M materials through CLAN approach. You are requested to explain and share your opinion: -

Question 1 (a) : Would you please mention, past and present procedure of sourcing O&M materials by your PBS ?

Question 1 (b) : Do you find any distinction between past and present procedure ? (Please tick the right answer)

Ans: Yes/No

Question 1 (c) : If yes, please state main points of distinction.

Question 2: Would you please state remarkable advantages of present procedure of purchasing O&M materials?

Question 3: Would you please state remarkable weaknesses of present procedure of purchasing O&M materials?

Question 4: (a) Please mention extent to which the “*quality*” of procured materials improved by following the hi-brid approach of procurement.

Quality improvement of materials	1	2	3	4	5
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1= Significantly Deteriorated, 2= Deteriorated, 3= Same as before, 4= Improved, 5= Significantly Improved

Question 4: (b) Do you think the PBSs ensure better “*price*” of O&M materials through present procurement practices? (Please put tick mark) **Ans : Yes /No**

Question 4: (c) If the answer of question no 4(b) is yes; please specify the scale of economy:

Scale of better price ensured by the PBSs	1	2	3	4	5
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1= Significantly Expensive, 2= Expensive, 3= Same as before, 4= Economical, 5= Significantly Economical

Question 4: (d) Please specify extent to which extent to which the “*lead time*” of delivering materials improved.

Improvement of lead time	1	2	3	4	5
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1= Significantly Deteriorated, 2= Deteriorated, 3= Same as before, 4= Improved, 5= Significantly Improved

Question 4: (e) How effective the present procedure is ? (please tick the appropriate box)

Effectiveness of present procedure	1	2	3	4	5	6
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1= Very Poor, 2= poor, 3= Acceptable, 4= Good, 5= Very Good, 6= Excellent

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