EFFICACY OF COST CONTROL AND COST REDUCTION MEASURES IN THE FERTILIZER INDUSTRY OF BANGLADESH

THESIS SUBMITTED TO THE UNIVERSITY OF DHAKA
FOR THE AWARD OF THE DEGREE OF
DOCTOR OF PHILOSOPHY

MD. ABDUL MANNAN

DEPARTMENT OF ACCOUNTING
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DHAKA-1000
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PREFACE

The study is about fertilizer industry in Bangladesh. It has been made possible with the financial support of the University Grants Commission of the Government of the People's Republic of Bangladesh. The study was undertaken because of the vital importance of fertilizer supply for increasing agricultural production. The government is interested in withdrawing subsidy from fertilizer. Supply of fertilizer to the farmers at a fair price can be possible without subsidy only if cost of production of fertilizer is brought down from the present level of cost through the use of well-designed techniques of cost control and cost reduction.

The author expresses his gratitude to the Government of the People's Republic of Bangladesh for granting study leave with pay for a period of three years.

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The researcher expresses his gratitude to Dr. Mohammad Habibullah, Professor, Department of Accounting and Dean, Faculty of Commerce, University of Dhaka who was very closely associated with this research as a Supervisor and made many invaluable contributions. His supervision, couples a great degree of intellectual freedom and enables the researcher to complete the study.

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Besides, the researcher is morally obligated to acknowledge the encouragement and services rendered by many of his close friends and relatives. Special and affectionate thanks to his wife Mrs. Salima Mannan and his sons and daughter Sohel, Sakil and Mousumi for their constant encouragement, moral support and sacrifice.

In fine, the research has the pleasure to claim that the entire piece of work is his original contribution and has not been submitted any where for a degree or diploma.

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ABSTRACT

The study addressed the fertilizer industry of Bangladesh; Specifically, an examination of cost control and cost reduction measure. The fertilizer industry in Bangladesh is a most critical industry because of its linkage both with industrialization and agricultural development. Since cost of production form the basis in fixation of selling price, the study of the various cost elements is very much significant in the context of subsidy policy of the government. An attempt has been made, in the study, to critically assess the present cost control and cost reduction techniques currently used. An effort has also been made to examine the efficiency and efficacy of different aspects of fertilizer industry, such as fertilizer production, reasons for its high production cost, its problems, and shortcomings faced in controlling and reducing cost.

The choice of the fertilizer industry as a topic for study was guided by a number of reasons like increasing efficiency, productivity and equal distribution of resources etc. etc. The researcher thought that production of fertilizer at a lower cost would enable the country to attain multiple objectives which are as follows:

i) Distribution of fertilizer at a fair price.

ii) Reduction of fertilizer cost which in tern enable the farmer to use the same for attaining self-sufficiency in food grain.

iii) Reduction of import of food resulting from state of self-sufficiency in food grain enable the government to save foreign currency.

iv) Increasing production of different crops like Jute, Cotton, Sugarcane etc. by the use of fertilizer at a lower cost.

Out of the six fertilizer factories in the country, four were selected for investigation. The theme 'reasonable period of production experience' was the basis for selecting the four factories as cited below, out of the six:

1. Natural Gas Fertilizer Factory Limited, Fenchugonj, Sylhet.
2. Urea Fertilizer Factory Limited, Ghorasal, Narsingdi.
3. Triple Superphosphage Complex Limited, North Potenga, Chittagong, and
4. Zia Fertilizer Company Limited, Ashugonj, Brahmanbaria.

These fertilizer factories produce Urea, Triple Superphosphate and Ammonium Sulphate fertilizer as their main products and Sulfuric Acid, Oleum and Gypsum as by-products.

This is a fact finding study based on the selected hypotheses. The focus of attention of this study was on the cost control and cost reduction measures adopted by the fertilizer factories. Both historical and current data upto 1985-86 have been collected from the primary and secondary sources. A check list was also prepared to facilitate collection of papers, documents, annual reports, cost sheets, official memoranda etc. Further, a structured questionnaire was developed and used for the collection of data relating to cost control and cost reduction techniques employed by concerned supervisors, managers and executives. The interview work was done by the researcher himself. Official documents and papers were also collected by him. For the above purposes, the researcher made several visits to the selected fertilizer factories.

The study has been divided into nine chapters:

Chapter I. It portrays an account of the significance of cost control and cost reduction covering its background and statement of the problem, reasons for selecting the fertilizer industry, objectives, hypotheses, methodology, and scope of the study.

Chapter II. It deals with a brief review of literature on cost control and cost reduction covering the theory of efficacy, cost control, cost reduction, cost consciousness, human and psychological problems of cost control and cost reduction efforts; needs and significance; tools and techniques: basic requirements; fields and areas of cost control and cost reduction etc.

Chapter III. The economics of fertilizer and need for cost minimization with a review of fertilizer - its origin, contribution of fertilizer to increase agricultural production and food self-sufficiency, fertilizer uses and consumption, fertilizer procurement and distribution, fertilizer price and subsidy, role of the Bangladesh Chemical Industries Corporation in the nationalised sector with reference to the fertilizer industry in Bangladesh all these aspects has been dealt with in this chapter.

Chapter IV. It is concerned with the analysis of the cost structure of the fertilizer factories under study, accounting patterns of the BCIC and its enterprises, budgetary control and standard costing system of the fertilizer factories covering production, production cost, cost per metric ton, and comparison of budget with the actual.

Chapter V. It presents X-rayed views of the Urea Fertilizer Factory Limited — a case study.

Chapter VI. It describes the determinants of production cost with reference to overall performance, capacity utilization, down-time, manpower position and labour productivity of the selected fertilizer factories.

Chapter VII. Cost consciousness of the executives of the fertilizer factories has been observed.

Chapter VIII. Findings of Internal Audit as a measure of cost control has been analysed.

Chapter IX. It presents the findings and also conclusions.

The findings of the study are given below:

1. Production cost of same variety of fertilizer such as urea varies from factory to factory in a particular.
2. The cost of production of same variety of fertilizer has been showing an increasing trend from year to year in the same factory.

3. Fertilizer cost per metric ton has been on the increase year after year despite increase in the volume of production.

4. All the factories in general use Budget and Standard Costing for control and cost reduction. But it shows as per present study (investigation) by the researcher that these instruments of control are not used systematically and effectively; the reason being lack of cost consciousness among workers, supervisors, managers and enterprise executives.

5. Though all these fertilizer factories have installed internal audit system for controlling the use of production ingredients but in actual practice it has been observed that the effectiveness of the said audit system is very very weak. The recommendation of the auditors for the adoption of drastic measures to check leakages, thefts, pilferages and wastages of resources are not taken seriously by the concerned authority.

6. It appears from the audit reports that right from the workers to the top executives of the factories there is no strong commitment to curtail pilferage, theft and wasteful utilization of resources inspite of strong direction from the auditor in this regard.

7. In the matter of procurement of materials and inputs, the five P's of efficient procurement namely, purchase of right input at the right price from the right source, at the right time and in right quantity is not given due consideration.

8. Inventory Management is rather weak, inflows and out flows of the inputs not being checked accurately and not being recorded promptly, and lead time not being followed carefully for which production stoppages occurs occasionally.

9. The system of Cost audit that is widely used in developing countries like India has not yet been used in Bangladesh. The non-application of the said audit causes improper utilization of materials, human resources etc. On the other hand the application of the said audit, it is accepted by the government of Bangladesh can boost up production and productivity. It can also detect the area of loopholes very easily.

10. It has been realised by the top management of the Bangladesh Chemical Industries Corporation that the future would appear bleak without effort to minimize cost of production.

Management of the fertilizer factories is progressive and willing to keep cost down but they have not been able to do it to the desired extent. The economic, social, political and legal environment are not conducive for the elimination of cost increase caused by theft, pilferage, improper use of inputs as detected in internal and external audit reports and also as observed by the researcher. The need for minimising wastages and ineffectual usage of production inputs have not been cultivated in the managers. The training facilities received by them were not designed to teach them the techniques of cost control and cost reduction. Modern tools like Appraisal audit system, Management audit system are still in the discussion stage. Even Cost audit

system has not been introduced. Probably the social norms and values do not encourage them to take drastic action even on wrong detected through the budget. They are not ready to take risk by jumping on measures to the extent as private entrepreneur are. However, there is evidence that awareness about cost control and cost reduction is being developed particularly because of the fear of conversion of the enterprise into holding companies about which the present government has a positive attitude.

In conclusion, it can be stated that the cost control and cost reduction as a precautionary measure would definitely give some impetus in increasing productivity and profitability not only to the fertilizer sector but other public and private sector also.

CHAPTER - I

SIGNIFICANCE OF COST CONTROL AND COST REDUCTION

1.01 BACKGROUND OF THE STUDY AND ITS PROBLEM.

Over the past several decades cost control and cost reduction have been a very popular topic in managerial research. The Institute of Cost and Works Accountants of England focused its analysis and published 'An Introduction to Budgetary Control Standard Costing Material Control and Production Control' in the year 1950[1] and also published a booklet of 'Cost Reduction' in the year 1956[2] describing the significance of cost control and cost reduction. Cost control has been defined by Eric L. Kohler as the employment of management devices in the performance of any necessary operation so that pre-established objectives of quality, quantity and time may be attained at the lowest possible outlay for goods and services. He also argued that such devices include a carefully prepared and reviewed bill of materials, instructions, standards of performance, competent supervision, cost limits on items and operations, and studies, interim reports and decisions based on the reports.[3] Thus it appears that cost reduction is a corrective function by continuous process of analysis of costs for further economy in the application of the factors of production. And, the concepts standard seems to be

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1. Institute of Cost and Works Accountants, An Introduction to Budgetary Control Standard Costing Material Control and Production Control, (London: 1950).

2. Institute of Cost and Works Accountants, Cost Reduction, (London: 1956).

3. Kohler, Eric. L., A Dictionary for Accountant, Fifth Edition, p.143.

challenged for further improvement. Professor B.K. Basu rightly observed that under the cost reduction method, standards became a subject matter of research for further standard.[4] For this purpose knowledge of cost control and cost reduction is a must which in turn will evolve cost consciousness.

The economy of Bangladesh needless to mention, is predominantly agricultural. The rate of growth in agriculture particularly in crops production is, therefore, of crucial importance for the economic development of Bangladesh. Chemical fertilizer is the central element in the modern agricultural technology for increasing production of agricultural crops. Since independence, fertilizer consumption has increased quite fast. The off-take of fertilizer was 3.80 lakh tons in 1973-74 and it increased to 12.60 lakh tons in 1984-85 showing an annual increase of 11.5% during the period, yet the intensity of fertilizer use is low as compared with countries which have achieved high yield of rice. In Bangladesh use of chemical fertilizer amounted to 21.6 kg. per acre of land in 1984-85 against 114 kg. in South Korea in 1982.[5] World Bank staff working paper disclosed that in India, the consumption and production of chemical fertilizers have increased at an annual compound rate of 17.9% and 17.6% respectively during the last 25 years (1952-53 to 1977-78).[6]

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4. Basu, B.K., "Cost Control", Survey. A Journal of the Indian Institute of Social Welfare and Business Management, Calcutta, May, 1974, p.46.

5. Government of the People's Republic of Bangladesh, The Third Five Year Plan : 1985-90, (Dhaka: The Planning Commission, 1985), p.165.

6. World Bank, A Survey of the Fertilizer Sector in India, (Washington, D.C., 1979)

Notwithstanding significant increase in recent years, the usage of fertilizer in Bangladesh is low compared with that of many other Asian countries.[7] Food and Agriculture Organization of the United Nations presented a table of member countries showing fertilizer use in per hectare of agricultural area, per areable land and permanent crops and per habitants[8] abstract of which are presented in a tabular form (Table-1.01). The table indicates that fertilizer consumption per hectare of agricultural area in 1983 for Bangladesh, Korea Republic, Korea DPR, and Japan were 55.9, 320.9, 337.9 and 388.1 kg. respectively which indicates the lowest fertilizer use in Bangladesh.

All the successive Five Year Plans of Bangladesh have been emphasising increased crop production.[9] The government is determined to increase agricultural production by popularising the use of chemical fertilizer along with irrigation water. As a result, the use of fertilizer has increased substantially.

The use of fertilizer was introduced in Bangladesh in the year 1950 and its annual consumption was only 2,698 tons. In 1960 fertilizer consumption was increased to 49,019 tons and in 1970 the total consumption was raised to 277,232 tons. In 1982-83 fertilizer consumption recorded its highest figure at 968,418 tons.[10] It is

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7. International Fertilizer Development Center, Bangladesh Policy Options for the Development of the Fertilizer Sector, (Alabama, 1983), p.16.

8. Food and Agriculture Organisation of the United Nations, 1984 FAO Fertilizer Year Book, (Rome, 1985), pp.46-48.

9. Government of the People's Republic of Bangladesh, The Third Five Year Plan 1985-90, (Dhaka: The Planning Commission, 1985), p.143.

10. Noor, M. Sajjad, (Krishibid), "Fertilizer Use Extension and Its Management", The Bangladesh Observer, (Dhaka: 5th February, 1986).

Table - 1.01

Fertilizer Consumption
(Total Fertilizer)

Countries	Per Hectare of Agricultural Area				Per Arable Land and Permanent Crops				Per Habitant			
	1974-76	1979	1981	1983	1974-76	1979	1981	1983	1974-76	1979	1981	1983
Bangladesh	20.1	41.8	41.1	55.9	21.5	44.6	43.8	59.6	2.5	4.7	4.4	5.7
India	15.8	27.7	31.7	36.8	17.0	29.7	34.0	39.4	4.6	7.4	8.1	9.0
Burma	4.8	9.0	12.1	15.3	5.0	9.3	12.5	15.8	1.6	2.7	3.5	4.3
Chi	16.2	33.9	39.2	47.1	62.2	130.3	150.2	180.6	6.7	13.2	14.9	17.5
Japan	355.1	428.2	345.3	388.1	388.8	477.7	387.2	437.0	17.8	20.2	16.0	17.6
Korea, DPR	213.0	328.6	341.0	337.9	217.9	336.0	348.6	345.2	29.4	42.9	42.9	41.2
Korea, Rep.	346.1	377.9	342.4	320.9	351.0	385.7	351.3	331.1	22.3	22.6	19.9	18.0
USA	42.6	48.9	45.4	46.0	97.3	109.9	102.0	104.5	84.7	93.0	84.5	84.7

Source: 1984 FAO Fertilizer Year Book.

evident from The Third Five Year Plan report that one of the reasons for low yield of rice in Bangladesh is the low level of chemicalization of the soil. In 1982 paddy yield in Bangladesh was 815 kg/acre, against 2490 kg. in South Korea, Sri Lanka had also higher level of chemical use (28.7 kg./acre) and a higher yield (1170/kg.acre) than Bangladesh. With the expansion of irrigation facilities of high yielding variety rice, wheat and other crops, the demand for fertilizer will increase to 18.85 lakh tons by 1989-90[11] as detailed out in table-1.02.

Table - 1.02

Fertilizer Distribution Target

Fertilizer	Unit	1984-85 Actual	1989-90 Target
Urea	'000' tons	832	1,206
TSP	'000' tons	346	554
MP	'000' tons	69	105
Others	'000' tons	13	20
Total :		1,260	1,885

Source: The Third Five Year Plan (1985-90) of the Government of the People's Republic of Bangladesh.

11. Government of the People's Republic of Bangladesh, The Third Five Year Plan, (Dhaka: The Planning Commission, 1985), pp.165-166.

The fertilizer industry in Bangladesh has been progressing substantially since its inception. The first fertilizer factory in the country was established in the year 1961 and started its commercial production from July, 1962.[12] There are now six fertilizer factories in Bangladesh. These factories produce Urea, TSP and Ammonium Sulphate; production of urea is much more than that of TSP and Ammonium Sulphate. An important feature of the use of fertilizer is that the increase in fertilizer price has been faster than that of the price of crops, which have dampened the desire of the farmers to use fertilizer in their crop land.[13] So, the government have popularised the use of fertilizer among the cultivators by supplying fertilizer to them at a subsidized price.

All the industrial units in the fertilizer sector are owned and managed by the Bangladesh Chemical Industries Corporation. In the recent past, there has been a shift in government policy relating to ownership of industrial units. The government have taken up a denationalization policy in 1975 disinvesting a number of nationalized concern which eventually diminished the wave of socialism started in 1972. Recently, under the New Industrial Policy of the Government, a process of privatisation has started. So, the government has decided to mobilise and increase resources of the country. As a result, the policy of subsidized sale of fertilizer is being

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12. Natural Gas Fertilizer Factory Limited, Annual Report 1985-86, (Fenchugonj), p.7.

13. Government of the People's Republic of Bangladesh, The Third Five Year Plan : 1985-90, (Dhaka: The Planning Commission, 1985), p.147.

amended accordingly. This has obliged the authorities concerned to emphasise control and reduction of the cost of production of fertilizer so that the farmers can get their required fertilizer at a fair price.

One Bangladeshi academician argued that in Bangladesh the rate of increase of costs of manufactured goods has been much higher than in other countries.[14] A researcher in the pre-liberation days reported that one important cause of high cost of production in Bangladesh is the managerial inefficiency and lack of cost consciousness.[15] Another researcher holds the view that the most baffling problems of our nationalised industries to-day are: to increase the operational efficiency, to arrest the leakage of profits or to reduce operating losses and thereby to control the cost of production.[16] The United Nations Industrial Development Organisation disclosed that high cost of production of fertilizer is the main problem in many developing countries.[17] As the fertilizer factories are under the ownership and control of the government, they are under tremendous pressure for minimizing the cost of production by plugging all the holes of leakages and wastages of their resources. So, the cost control and cost reduction constitute an important area for research.

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14. Khan, Azizur Rahman, "A Study into the Causes of High Cost of Production of Manufactured Goods in Bangladesh", The Dhaka University Studies, Part-A, (Dhaka: 1974), p.211.

15. Habibullah, M., "A Case for Responsibility Accounting", The Industrial Accountant, (Karachi: The Pakistan Institute of Industrial Accountants, 1971), p.22.

16. Khan, Md. Muinuddin, "An Evaluation of Accounting Practices in Bangladesh", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1984), p.31.

17. United Nations Industrial Development Organisation, Recent Developments in the Fertilizer Industry, (New York: 1972), p.93.

The researcher of the present dissertation has been encouraged by the observation made by some eminent social scientists and academician of the country. For example, one economist observed that at the public sector industrial enterprises adequate management information was not maintained, proper costing was not done, appropriate budgetary control was not applied and there existed very little cost consciousness amongst the executives.[18] A professional Cost Accountant observed that higher prices of goods posed a serious economic and social problem.[19] An experienced Cost Accountant focused the methods of cost control and cost reduction in the nationalised industrial sector.[20] Lack of cost-mindedness among the managers of public sector unit has been observed by Professor Dr. M. Habibullah.[21]

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18. Ahmed, Q. Kholiquzzaman, "The Management of Nationalised Industries Sector in Bangladesh : Some Comments on the First Five Year Plan Proposals". Political Economy, Vol. 1, No. 1 (Dhaka: Bangladesh Economic Association, 1974), p.257.

19. Miah, Md. Uttam Ali, "Why Cost Control and How to Control", paper presented in 'Cost Control and Cost Reduction' Seminar sponsored by the Institute of Cost and Management Accountants of Bangladesh, Dhaka, on October 30, 1981.

20. Shahidullah, Md., "Methods of Cost Control and Cost Reduction in the Nationalised Industrial Sector", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1975).

21. Habibullah, M., "Making Employees Cost-Minded", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the Institute of Cost and Management Accountants of Bangladesh, Dhaka, on October 30, 1981.

1.02 REASONS FOR SELECTING THE FERTILIZER INDUSTRY

The United Nations Industrial Development Organisation (UNIDO) presented a Monograph entitled, "Fertilizer Industry" which was based on the proceedings of the International Symposium on Industrial Development, November-December, 1967 in Athens, in which great emphasis was put on the fertilizer industry.[22] In this monograph it was said that it (this industry) held a unique position in developing countries because it is linked both with agricultural development and industrialization. In this Monograph, UNIDO stated that although agriculture is its principal customer , still the fertilizer industry has links with many other industries.[23] As for example, the oil and natural gas industries supply hydrocarbons as raw-materials to the fertilizer industry, the mining industry supplies phosphate rock, potash and minerals and sulphur, the ammonia produced by the fertilizer industry has many industrial applications, Ammonium nitrate is used as an industrial explosive, particularly in coal mining, Urea is used in making urea-formaldelyde plastics, Phosphoric acid has many industrial uses, Ammonium phosphate is used as a fire-proofing agent, Ammonium Chloride, which is important in the manufacture of dry batteries, and Soda ash is made as joint product in a process used in several Asian countries. Thus in many developing countries fertilizers provide the nucleus for a broadly-based chemical industry.

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22. United Nations Industrial Development Organization, Fertilizer Industry, (New York: United Nations, Monograph No. 6, 1969), p.1.

23. Ibid., p.2.

The choice of fertilizer industry as an area of investigation in Bangladesh has been made for a number of reasons.[a] The researcher thinks that production of fertilizer at a lower cost will enable the country to attain multiple objectives noted below:

1. The farmer will get fertilizer at a fair price, enabling him to bring about green revolution in the country.

2. It will enable the farmer to increase food production, which can help to attain self-sufficiency in food and reduce dependence on food import.

3. It will increase the production of raw materials required for different manufacturing industries e.g. jute for jute industry, cotton for textile industry, and sugarcane for sugar industry, etc.

4. It will also increase the production of cash crops for earning more foreign currency through export.

5. Further, it will encourage more and more production of crops, investment in agricultural crop production, adoption of better and improved production technology, and increase efficiency of agricultural production.

6. Finally, it will increase farm production and farmer's income, which will gradually lead to farmers ability to live on their own, and ultimately they will work hard to produce more and more bringing for the cause of green revolution in the country.

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a. See Abstract.

1.03 OBJECTIVES OF THE STUDY

The main objective of the study is to make a critical assessment of the existing practices of cost control and cost reduction measures in the fertilizer industry. The specific objectives of this study are as follows:

1. To ascertain the productwise cost of production of different fertilizer factories.

2. To identify the causes of high cost of production for which subsidy has got to be given.

3. To examine the functions now performed by the cost accounting department.

4. To examine the extent to which modern cost control and cost reduction techniques such as Budgetary Control, Standard Costing, Breakeven Analysis etc. are applied.

5. To examine which elements of cost are controllable in the individual fertilizer factory.

6. To examine the extent to which work methods, equipments, factory design and layout are conducive to production at minimum cost.

7. To indicate the cost of production per metric ton over the years in relation to fertilizer price.

8. To assess the existing organisational climate favourable for cost control and cost reduction and to evaluate the attitude of workers, employees and management toward cost control and cost reduction measures.

9. To identify the causes for which the cost of production of the same variety of fertilizer varies from one factory to another.

10. To find out the amount of loss incurred by the fertilizer factories as a result of sale of fertilizer at a subsidized price.

11. To examine the extent to which fertilizer factories have requisite trained manpower to help management in cost control and cost reduction matters.

12. To examine how far, workers, supervisors and managers of different levels are cost conscious.

13. To examine how far the control over the different elements of costs viz. material, labour and overhead expenses exercised by the authorities concerned, has been found effective.

14. To present an action plan to the management for effective cost control and cost reduction.

1.04 HYPOTHESES OF THE STUDY

In order to realise the objective of the study, the following specific hypotheses have been developed for verification through empirical investigation:

1. The cost of production of fertilizer per metric ton has been increasing year after year despite the commitment of the government to ensure distribution of fertilizer among the farmer at a reasonably fair price.

2. Acceptance and use of cost control and cost reduction techniques like Budgetary Control and Standard Costing by enterprise personnel is half hearted and ineffective rather than systematic and well designed viz.

   (a) Cost control measures like Value Analysis and Suggestion Scheme widely used in the mature economies have not received any mentionable recognition in Bangladesh fertilizer factories.

   (b) Break-Even Analysis is not used as a cost control device meaningfully.

   (c) Cost planning through efficient and effective procurement of production inputs is lacking i.e. five P's of procurement are not followed strictly though there is a full-fledged department of Material Planning and Inventory Control (MPIC).

(d) Principles of efficient Material Planning viz., Minimum Limit, Maximum Limit and Re-ordering level is not maintained properly.

(e) While placing order for purchase of imported inputs, lead time is not considered carefully.

(f) While purchasing inputs from domestic market, there is a tendency for emergency purchase at cash which raises purchase price.

(g) While purchasing inputs Economic Order Quantity (EOQ) is not considered.

(h) Perpetual Inventory System and Always Better Control (ABC) system for materials, work in progress and finished stock are not used properly.

(i) Management of inventory items such as stores, spares and accessories and finished goods is weak, which raises the cost and adversely affects profitability.

3, There is no system of cost audit in Bangladesh. It may be noted that this very system has reportedly helped the neighbouring country like India to reduce their costs.

4. Costs are not segregated into fixed and variable categories though it was done several years ago.

5. Overhead expenditures are not subjected to scrutiny and analysis for exploring the scope for cost reduction.

6. Responsibility Accounting is not enforced and the various expenses of the factory are not properly grouped into suitable cost centres.

7. Emphasis on production alone neglecting marketing, promotes inventory build up of finished goods which increases interest cost.

8. Cost consciousness among the people employed and connected with the fertilizer industry in Bangladesh, has not been developed.

1.05 METHODOLOGY OF THE STUDY

This is a fact finding study based on the selected hypotheses. The following methods of data collection have been followed:

1. Reading of books, journals and magazines containing information about fertilizer industry.
2. Collection of published Financial Statements and Annual Reports of the fertilizer factories under survey.
3. Collection of papers and documents containing information about budgets, targets, and cost data relating to cost of production of fertilizer.
4. Interview of enterprise officers and executives connected with production cost.
5. Personal observation in the Divisions, Departments and Sections in which expenses are incurred.

a. STUDY INSTRUMENTS

Data collection work was done with the help of the following study instruments:

1. A questionnaire has been developed for the interview of the officers and executives employed in the fertilizer factories (Appendix-7.01).
2. A check list has also been prepared to facilitate collection of papers, documents, annual reports, cost sheets, official memoranda etc.

b. TYPES OF DATA COLLECTED

Types of information and data collected with the help of questionnaire, interview and discussion, personal observation and review of official documents and reports are as follows:

1. Fertilizer demand.
2. Fertilizer production target.
3. Fertilizer production.
4. Fertilizer deficit.
5. Fertilizer imports.
6. Fertilizer exports.
7. Fertilizer prices.
8. Fertilizer subsidies.
9. Capacity utilization of the fertilizer factories.
10. Down time.
11. Manpower position.
12. Budgeted cost.
13. Actual cost.
14. Production cost.
15. Conversion cost.
16. Total manufacturing cost.
17. Cost of goods manufactured.
18. Cost of goods sold.
19. Variable cost.
20. Fixed cost.

21. Material cost:
    (a) Raw materials.
    (b) Chemicals.
    (c) Packing materials.
22. Labour cost (salaries and wages):
    (a) Worker.
    (b) Staff.
    (c) Officer.
23. Power and fuel cost.
24. Stores, spares and accessories cost.
25. Insurance cost.
26. Depreciation cost.
27. Interest and financial cost.
28. Head office overhead.
29. Factory overhead.
30. Administrative overhead.
31. Selling and distribution overhead.

The interview work has been done by the researcher himself. Official documents and papers have been collected by him, personal observation has also been made by him. For the above purposes the researcher has paid several visits to the enterprises with letters issues by the head office to the enterprise heads requesting co-operation being extended to the academic exercise of the researcher. The guide of the researcher addressed the chairman of BCIC requesting him to extend all possible co-operation in the supply of materials necessary for the preparation of the thesis.

1.06 SCOPE OF THE STUDY

There are two types of fertilizers, viz., (i) natural fertilizer, and (ii) chemical fertilizer. The study is limited only to the chemical fertilizer in Bangladesh. The focus of attention of this study is the cost control and cost reduction measures adopted by the fertilizer factories in Bangladesh.

There are six fertilizer factories in Bangladesh. These are under the administrative jurisdiction of the Bangladesh Chemical Industries Corporation (BCIC). These factories are:

1. Natural Gas Fertilizer Factory Limited (NGFF).
2. Urea Fertilizer Factory Limited (UFFL).
3. Triple Superphosphate Complex Limited (TSPC).
4. Zia Fertilizer Company Limited (ZFCL).
5. Polash Urea Fertilizer Factory Limited (PUFF).
6. Chittagong Urea Fertilizer Factory Limited (CUFF).

Out of these six factories, the following four factories have been selected for preparing the thesis of the researcher:

1. Natural Gas Fertilizer Factory Limited,
   Fenchugonj, Sylhet.
2. Urea Fertilizer Factory Limited,
   Ghorashal, Narsingdi.
3. Triple Superphosphate Complex Limited,
   North Potenga, Chittagong.
4. Zia Fertilizer Company Limited,
   Ashuganj, Brahmanbaria.

The reasons for selecting these four factories are as follows:

(a) The Natural Gas Fertilizer Factory Limited is the oldest fertilizer manufacturing enterprise of the country established in 1961 and has been producing Urea and Ammonium Sulphate fertilizer since 1962.

(b) The Urea Fertilizer Factory Limited established in 1970 produces only one kind of fertilizer namely Urea.

(c) The Triple Superphosphate Complex Limited located in Chittagong was established in 1974 to produce TSP fertilizer.

(d) The Zia Fertilizer Company Limited was established in 1983 at Ashugonj for the production of Urea.

It is clear that Urea fertilizer is produced in three of the selected factories, Ammonium Sulphate is produced in one of the four factories while TSP is produced again only in one factory out of the four factories.

The researcher thought that a factory to be included in the survey must have a reasonable period of production experience. The Natural Gas Fertilizer Factory Limited has production experience of 25 years, the Silver Jubilee of which was observed in 1986; the Urea Fertilizer Factory Limited at Ghorashal functioning since 1970

has production experience of 16 years; the TSP Complex Limited started production in 1974 having production experience of 12 years and the Zia Fertilizer Company Limited at Ashugonj has production experience of three years, production having been started from 1983.

The other two fertilizer factories in the country have production experience for less than three years, they are yet to start production on full scale. For these reasons these two fertilizer factories have been excluded from the study.

1.07 CONTENTS OF RESEARCH

The study on the subject has been divided into nine chapters. Chapter 1 is an introductory chapter, already discussed, covering its background and problem, reasons for selecting the fertilizer industry, objectives, hypotheses, methodology and scope of the study. The outline of various chapters are given below:

Chapter 2 : It deals with a brief review of literature on cost control and cost reduction covering the theory of efficacy, cost control, cost reduction, cost control vs. cost reduction, cost consciousness, human problem of cost control and cost reduction; needs and significance; tools and techniques; basic requirements; fields and areas of cost control and cost reduction.

Chapter 3 : It discusses the economics of fertilizer and need for cost minimization with a review of fertilizer - its origin, fertilizer vis. agricultural output and food self-sufficiency, fertilizer uses and consumption, fertilizer procurement and distribution, fertilizer price and subsidy, role of BCIC in the nationalised sector, and the position of the fertilizer industry in Bangladesh.

Chapter 4 : It is devoted to the analysis of the cost structure of the fertilizer factories under study is concerned with the introduction of accounting patterns of the BCIC and its enterprises, budgetary control and standard costing system of the fertilizer factories covering production, production cost, cost per MT, comparison of budget and actual.

Chapter 5 : It presents X-rayed views of the Urea Fertilizer Factory Limited - a case study.

Chapter 6 : It is concerned with determinants of production cost with reference to overall performance, capacity utilization, down-time, manpower position and labour productivity of the selected fertilizer factories.

Chapter 7 : It analyses the cost consciousness of the executives of the fertilizer factories under study.

Chapter 8 : It presents the findings of Internal Audit as a measure of cost control.

Chapter 9 : It includes findings and conclusion of the study which focus the areas of cost improvement of the selected fertilizer factories and particularly the nationalized industrial sector as a whole.

CHAPTER - II

REVIEW OF LITERATURE ON COST CONTROL AND COST REDUCTION

2.01 A BRIEF REVIEW OF LITERATURE ON COST CONTROL AND COST REDUCTION

The present emphasis upon cost control and cost reduction is not a new function of accounting and management. The need for cost effectiveness had its origin from the start of Industrial Revolution and in the subsequent development of Large Scale Enterprise. It has already been mentioned that this study is about cost control and cost reduction. Cost consciousness is age-old; it is inherent in the nature of business enterprise. First efforts for cost control and cost reduction were made in the sphere of labour by F.W. Taylor, the father of Scientific Management. The efforts of Taylor and other pioneers of his times were directed to increase labour productivity to reduce the per unit cost of labour. In the fore front of the technological development, new inventions and innovations reduced the per unit cost of output. The expanding market that matched with the speed of manufacture led to business expansion, which incidentally resulted in lowering the cost. Though financial accounting is concerned with recording of all types of costs in terms of money value yet, it lacks its propriety so far as the areas of cost leakages are searched for. Cost Accounting thus, came to be recognised as a means to achieve the purpose. It became necessary for the manufacturers:

i) To identify costs to a product, job, process, etc.;

ii) To improve quality for varied reasons;

iii) To control costs;

iv) To reduce costs; etc.

A few studies in the U.S.A. show significant relationship between cost control and cost reduction and the productivity. In 1931, The National Industrial Conference Board, New York, emphasised on the need of Budgetary Control in Manufacturing Industries.[1] Eminent writers on the subject as as Voitsberger,[2] Henrici,[3] Goetz,[4] Smiddy,[5] and Petersen[6] put emphasis on the necessity of cost control and cost reduction in manufacturing and in managerial planning and control. Pugsley,[7] an American Cost Accountant in his paper, presented to the 32nd Annual International Cost Conference of the National Association of Cost Accountants of USA, in 1951, stated that it was necessary to build up cost consciousness among the employees for the purpose of cost control and cost reduction.

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1. National Industrial Conference Board, Budgetary Control in Manufacturing Industry, New York, 1931.
2. Voitsberger, D.M., "Standard Costs and Cost Standards", Modern Management, 1945.
3. Henrici, Stanley B., Standard Costs for Manufacturing, McGraw-Hill Book Company Inc., New York, 1947.
4. Goetz, Billy, E., Role of Costs in Managerial Planning and Control, SAM Publication, Chicago Chapter, 1947.
5. Smiddy, Harold F., Managers and Cost Control, Proceedings, SAM, 1949.
6. Petersen, Elliott, "Setting Cost Reduction Goals", Advanced Management, 1950.
7. Pugsley, John., The 32nd Annual International Cost Conference of the NACA, The Management Review, 1951.

The concept of cost control and cost reduction became a very popular topic in U.S.A. and U.K. Later on its popularity gradually spread in the developing countries of Asia.

Like other developing countries Bangladesh started thinking about cost control and cost reduction while planning their industrialisation program. So, Bangladesh participated in many International Cost Conference[a] and collected ideas about this topic from the industrially developed countries.

Many experts, researchers, teachers have expressed their views in their different articles[8] for the introduction of cost control and cost reduction in Bangladesh.

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a. Cost Conference in Madras, India in 1979 sponsored by the Institute of Cost and Works Accountants of India. (Representative of the Institute of Cost and Management Accounts of Bangladesh participated.)

8. (a) Ahmed, Muzaffar, "The Prospects and Problems of Nationalised Industries", Management, Business and Economics, Journal of the Institute of Business Administration, Dhaka University, Dhaka, Vol. 1, No. 1, 1975, pp.29-33.

   (b) Rahman, Mawdudur, "Budget Behaviour Managerial Approach to Budgetary Control", Management, Business and Economics, The Institute of Business Administration, Dhaka University, Dhaka, Vol. III, No. 3, pp.331-88.

   (c) Habibullah, M., "Making Employees Cost Minded", Management, Business and Economics, The Institute of Business Administration, Dhaka University, Dhaka, Vol. I, No. 3, 1975, pp.124-131.

   (d) Rahman, Mawdudur, "A Notes on Controls and Accounting in Nationalised Corporation in Bangladesh", Management, Business and Economics, The Institute of Business Administration, Dhaka, 1978, Vol. IV, No. 1, pp.77-82.

   (e) Ahmed, Quazi Kholiquzzaman and Chowdhury, Anwaruzzaman, "What has been happening to productivity in manufacturing sector of Bangladesh ? A Case study of Selected Industries", A Research Report of The Bangladesh Institute of Development Studies, 1972, Series No. 4.

(Contd...)

Footnote 8 continued

(f) Bakht, Zahid and Rahman, Siddiqur, "Comparative Cost Structure - A Study of Selected Manufacturing Industries of Bangladesh", The Bangladesh Institute of Development Studies, Dhaka, 1974, Vol. 2, No.4, pp.425-44.

(g) Chowdhury, Nuimuddin, "A Social Cost-Benefit Analysis of the Tea Industry of Bangladesh", The Bangladesh Institute of Development Studies, Dhaka, 1975, Vol.3, No.4, pp.379-402.

(h) Hashem, M. Abdul, "Cost Control and Cost Reduction", The Cost and Management, Journal of the Institute of Cost and Management Accountants, Dhaka, 1979, Vol.VI, No.3&4, pp.35-41.

(i) Hasan, M.N., "Cost and Budgetary Control Needed in Jute Industry", The Cost and Management, The Institute of Cost and Management Accountants of Bangladesh, Dhaka, 1978, Vol. V, No.2, pp.33-36.

(j) Miah, Md. Uttam Ali, "Budget and Budgetary Control in Industrial Enterprises", The Cost and Management, The Institute of Cost and Management Accountants of Bangladesh, Dhaka, 1980, Vol. VIII, No. 2&3, pp.25-28.

(k) Aphiluddin, Md., "Controlling through Budgeting", The Cost and Management, The Institute of Cost and Management Accountants of Bangladesh, Dhaka, 1982, Vol. X, No. 2, pp.12-15.

(l) Ahmed, Muzaffar, "Cost Reduction by Value Analysis", The Cost and Management, The Institute of Cost and Management Accountants of Bangladesh, Dhaka, 1982, Vol. X, No. 4, pp.14-20.

(m) Ahmed, Z.U., "Social Cost-Benefit Analysis", The Bangladesh Accountant, The Institute of Chartered Accountants of Bangladesh, Dhaka, First National Conference Issue, 1984.

(n) Bhattacharjee, Durgadas, "Managerial Performance of the Public Sector Industry : A Review of Concepts and Trends of Performance of the Sugar Industry in Bangladesh", The Dhaka University Studies, Part-C, (Dhaka: University of Dhaka, 1985, Vol. VI, No. 1).

(o) Loqman, Md., "Management Use of Accounting Information in Financial Decisions and Control of Nationalised Industries in Bangladesh", Unpublished Ph.D. Thesis (Dhaka: University of Dhaka, 1984).

(p) Baquer, A.A.M., "Management for Self-Reliance", The Dhaka University Studies, Part-C, Vol. 2, No. 1, (Dhaka: University of Dhaka, 1981).

The Institute of Cost and Management Accountants of Bangladesh arranged a conference on "Cost Control and Cost Reduction" in the year 1981 in which Scholars, Researchers, Teachers, Professional Accountants participated. Time to time seminars on, "Budgetary Control", "Cost Audit and Inventory Management", were organised by the said Institute. The objectives of these Conferences and Seminars were to give emphasis on cost minimization and to make the employees cost minded.

M.A. Hye[9] of Chittagong University, Faculty of Commerce, did a pioneering study in relation to jute industry of Bangladesh, as to how budget can be accepted as an instrument of control if the concerned executives accept it with an open mind. M.M. Mahmud[10] of the same University, also highlighted the causes of high cost of production in the public sector enterprises.

M. J. Hoque[11] in his thesis critically examine the existing practice of financial planning and control in Public Sector Industries in Bangladesh. He selected 6 industries covering 242 enterprises, whose activities covered the period from 1975-76 to 1977-78. In that thesis Dr. Hoque showed that there were sharp unfavourable

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9. Hye, M.A., "Acceptance and Use of Budget by Managers of Nationalised Industrial Enterprises in Bangladesh", Unpublished Ph.D. Thesis, University of Dhaka, 1982.

10. Mahmud, Monjur Morshed, "Accountability of Public Industrial Enterprises in Bangladesh", unpublished Ph.D. Thesis, University of Chittagong, 1984.

11. Hoque, Md. Jahirul, "Financial Planning and Control in the Public Sector Industries in Bangladesh", unpublished Ph.D. Thesis, University of Dhaka, Dhaka, 1981.

variances between the budgeted total costs and actual total costs which varied from 14.5 per cent to 19.9 per cent in the case of the industries concerned owing to poor cost control.

All these researchers thought that effective implementation and execution of cost control and cost reduction devices would help to reduce cost, increase profit and promote efficiency.

From the above findings of Bangladesh Jute, Cotton and other big industries, the researcher thought that while using the traditional methods of cost accounting techniques to control and reduce manufacturing and non-manufacturing costs, it also introduces new measures suggested in recent literature on the subject and advocates their implementation in the fertilizer factories of Bangladesh.

2.02 EFFICACY OF COST CONTROL AND COST REDUCTION

The literal meaning of the word, "Efficacy" is capacity for producing desired result. It is a measure of success in any work in the field of human endeavour. Here (in this topic) it means the measure of success attained in controlling and reducing the cost of production. Different men used different words for measuring the production capacity such as Efficacy, Cost Effectiveness and Productivity.

In February, 1962 the Second All-India Seminar on Public Enterprises was organized by the Department of Commerce, Osmania University, Hyderabad. The papers read out in the seminar were edited by V.V. Ramanadham, Professor and Head of the Department of Commerce, Osmania University and published under the title, "The Efficacy of Public Enterprise".[12] The important object of the seminar was to provide the necessary synthesis between academic ideas and practical views on a subject of growing importance in India, namely - the public sector and the attention was confined to three topics: Public Enterprise and Regional Development, Social and Economic Returns of Public Enterprises, and Management Boards of Public Enterprises.

The public sector has of late been the target of public criticism and all the ills in the national economy are being attributed to it.[13] That being so, it is necessary to review the state of affairs in the industrial sector with a view to taking corrective measures and one of the instruments of assessing the efficacy of the existing industries is to ask the authority concerned to publish the annual report containing the balance sheet and the profit and loss accounts.[14] These give us a very clear idea about the significance and importance of the word efficacy.

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12. Ramanadham, V.V. (edited), The Efficacy of Public Enterprise, Allied Publishers Private Limited, Bombay, 1963.

13. Afzal, Md. Anwarul, "Diagnosis and Remedies : The Public Sector Sickness", The Bangladesh Observer, Dhaka, 8th Feb. 1987.

14. The Bangladesh Observer, "Instrument of Control", Editorial, Dhaka, December 22, 1985.

2.03.1 THE CONCEPT OF COST

While discussing cost control and cost reduction, it is necessary to know what is cost. The following are the views about the concept of cost expressed by different internationally reputed writers. Everybody is well aware of the fact that virtually every activity in business involves costs.[15] Most business are facing new problems requiring a much greater emphasis on identifying and isolating costs.[16] The management accountant characteristically is concerned with costs.[17] Cost is difficult to define.[18] Cost is a term with many uses but always with the connotation of sacrifice of resources.[19] Cost is the sum of money or equivalent expanded in terms of labour, materials, use of equipment, rent etc. to produce a product or service.[20] According to Anthony and Welsch, cost is a measurement, in monetary terms of the amount of resources used for some purposes.[21] W.M. Harper has defined cost

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15. Nickerson, Charence B., Managerial Cost Accounting and Analysis, McGraw-Hill Book Company, New York, 1962, p.1.
16. Kirkland, Don, "Cost Systems : How to Develop them Effectively", Hand Book of Business Problem Solving, Edited by Albert, K.J., McGraw-Hill Company, New York, 1980, p.7-3.
17. Lynch, Richard M., and Williamson, Robert W., Accounting for Management : Planning and Control, McGraw-Hill Book Company, New York, 1983, p.18.
18. Shillinglaw, Gordon, Cost Accounting : Analysis and Control, Richard D. Irwin, Inc., Illinois, USA, 1961, p.54.
19. Parker, R.H., Macmillan Dictionary of Accounting, Macmillan Press, London, 1984.
20. Johannsen, Hano, and Page, G. Terry, The International Dictionary of Business, Prentice-Hall, Inc., Euglewood Cliffs, New Jerry, 1981.
21. Anthony and Welsch, Fundamentals of Management Accounting, Richard D. Irwing, Inc., 1974, p.25.

as the value of economic resources used as a result of producing or doing the thing costed.[22] Cost as a factor for controlling activities in an industry is generally recognised as an indication of managerial efficiency.[23] According to Ryall, practically in all cases a 'Cost' is the sum of three groups or components — the purpose or transfer price of material, the cost of the hire of labour and the value of other disbursements made or expenditure incurred in achieving the desired product or result.[24] The committee on cost concepts and standards of the American Accounting Association defined cost as a foregoing, measured in monetary terms, incurred or potentially to be incurred to achieve a specific objective.[25] In a tentative set of broad accounting principles for business enterprises, cost is defined as, an exchange price, a foregoing, a sacrifice made to secure benefit, the foregoing or sacrifice at the date of acquisition is represented by a current or future diminution in cash or other assets.[26] The American Institute of Certified Public Accountants defined, cost is the amount, measured in money,

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22. Harper, W.M., Cost Accounting, MacDonald and Evans, U.K., 1977, p.5.

23. Terry, George R., Principles of Management, Richard D. Irwin Inc., Ontario, 1977, p.552.

24. Ryall, Dictionary of Costing, quoted by B.K. Bhar, "Cost Accounting : Methods and Problems, Academic Publisher, Calcutta, 1972, p.13.

25. American Accounting Association, Report of the Committee on Cost Concepts and Standards, The Accounting Review, Vol. XXVII , No.2, p.176.

26. Robert T. Spouse and Maurice Moonitz, Accounting Research Study, No.3 (A tentative set of broad accounting principles for business enterprise), American Institute of Certified Public Accountants, New York, 1962, p.25.

of cash expended or other property transferred, capital stock issued, services performed, or a liability incurred, in consideration of goods or services received or to be received.[27] According to M.N. Hassan, cost represents an expenditure - a decrease in assets or an increase in liabilities - made to secure an economic benefit, generally resources that promise to produce revenue.[28]

Costs vary in accordance with purposes, objectives or aims of economic activities. This is clear from the remarks of Professor B.K. Basu[29] that cost of yesterday is not equal to cost of today and cost of today will not be equal to the cost of to-morrow due to rising prices in economy. Accounting scholars[30] in Bangladesh also feels in the same way. The term cost implies the total resources consumed to accomplish a specific objective.[31] The specific objective to be accomplished might be the production of something or a group of things, the acquisition of some service, a service rendered to a hospital patient or a bank customer, a machine-hour, a social welfare project, a mile of road, the measurement of net income or any other conceivable activity. According to Matz & Usry,

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27. American Institute of Certified Public Accountants, Committee on Terminology, Accounting Terminology Bulletin No.4, 1977, p.1.

28. Hassan, Md. Nurul, Cost Control and Cost Reduction under Inflation, paper presented in 'Cost Control and Cost Reduction' conference sponsored by the Institute of Cost and Management Accountants of Bangladesh, Dhaka, October 30, 1981.

29. Basu, B.K., "Cost Control", Survey, A Journal of the Indian Institute of Social Welfare and Business Management, Calcutta, May, 1974, p.47.

30. Talukder, Md. Yusuf, "Why do we need Inflation Accounting", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, Vol.4, No.1, July-September, 1980), p.35.

31. Gray, Jack & Ricketts, Don, Cost and Managerial Accounting, McGraw-Hill Book Company, New York, 1982, p.17.

it is a fundamental axiom that a cost must be understood in its relationship to the aims or purposes which it is to serve.[32]

R. A. Howell and S. R. Soucy[33] described that the cost accounting system should identify all costs required to design, purchase, manufacture, market and sell a product.

Management endeavours to obtain the right proportion of the factors that go into the funished product. Each factor represents a cost incurred. Each cost incurred should have added value in excess of its costs to the final product. Costs that does not add to value must be abolished.

Thus it appears that cost have a direct influence on selling prices and volume of sales, which in tern determine the size of profits. If proper measures can be taken to control costs and minimise wastage and spoilage, the production costs can be reduced, resulting in a more competitive pricing policy by the fertilizer sector and a decline in the level of government subsidy. Hence, the purpose of this study is to investigate the extent to which to costs in the nationalized fertilizer factories could be reduced and how an efficient system of cost control and cost reduction could be implemented.

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32. Matz, Adolph, & Usry, Milton, Cost Accounting : Planning and Control, South-Western Publishing Co., USA, 1980, p.40.

33. Howell, Robert A., and Soucy, Stephen R., "Cost Accounting in the New Manufacturing Environment", Management Accounting. (N.J.: Mont Vale: National Association of Accountants, Vol. LXIX, No.2, August, 1987), p.43.

2.03.2 COSTS IN THE EYE OF ACCOUNTANTS AND ECONOMISTS

The following quotations from some eminent specialists in accounting show how comprehensive and varied is the meaning of the word 'Cost'. The word cost is very comprehensive and is being used by different people at different times to mean different things.[34] Accountants, Economists, Engineers and others facing cost problems have developed cost concepts and cost terminology according to their needs.[35] According to C.T. Horngren,[36] Accountants usually define costs are resources sacrified or foregone to achieve a specific objective. Dewett and Chand[37] defines economic cost as,

by economic costs is meant those payments which must be received by resource owners in order to ensure that they will continue to supply them in the process of production. This definition is based on the fact that resources are scarce and they have alternative uses. To use them in one process is to deny their use in other processes. Economic cost includes normal profit.

Accountants' classification of costs are usually set up for legal, financial control and auditing purposes while economists' classifications are designed to provide decision making guidelines for management to achieve the firms economic goals.[38] Economic

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34. Mohiuddin, Md., "Why Cost Control and How to Control", paper presented in the 'Cost Control and Cost Reduction' Conference sponsored by the ICMAB, Dhaka, October 30, 1981.

35. Matz, Adolph, & Usry, Milton, Cost Accounting : Planning and Control, South-Western Publishing Co., USA, 1980, p.39.

36. Horngren, Charles, T., Cost Accounting : A Managerial Emphasis, Prentice-Hall International Edition, USA, 1982, p.21.

37. Dewett, K.K., and Chand, Adarsha, Modern Economic Theory, Shyam Lal Charitable Trust, New Delhi, 1984, p.148.

38. Mote, U.L., Paul S., and Gupta, G.S. Managerial Economics: Concepts and Cases, Tata Mcgraw-Hill Publishing Company Limited, New Delhi, 1978, p.65.

cost may be grouped as money cost, nominal cost, real cost, opportunity cost, implicit and explicit cost, transfer cost, entrepreneur's cost etc.[39]

In this study the economic costs has been excluded and the accounting costs has been considered.

2.03.3 COSTS, EXPENSES AND LOSSES

Sometimes 'Cost', 'Expense' and 'Loss' create confusion in the mind of Economists and Accountants. As a matter of fact, there is a clear-cut distinction among costs, expenses and losses. Backer and Jacobsen clearly distinguished costs from expenses and losses with clear examples; 'costs' represent that portion of the acquisition price of goods, property, or services which has been deferred or not yet utilized in connection with the realization of revenue. Fixed assets and inventories are examples of such deferred costs. 'Expenses' are costs which have been applied against the revenue of a particular period. Office salaries are expenses of the period in which they are incurred. 'Losses' are reductions in firm equity, other than from withdrawals of capital, for which no compensating value has been received. Destruction of a plant by tornado or fire is an example of a loss.[40] The focus of cost accounting is on

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39. Dewett, K.K., and Chand, Adarsha, Modern Economic Theory, Shyam Lal Charitable Trust, New Delhi, 1984.

40. Backer, Morton, and Jacobsen, Lyle E., Cost Accounting : A Managerial Approach, McGraw-Hill Book Company, New York, 1964, pp. 3-4.

costs, not expenses.[41] Frequently the term 'Cost' is used synonymously with the term 'expense' and means an expired cost. Yet the term 'Cost' is used for both assets and expenses. The 'expense' refers to the sacrifice, the renouncing aspect of the revenue transaction. Expenses are measured outflow of goods and services that are matched with revenue to determine income.[42]

An expense is defined as the expired cost resulting from a productive usage of an asset.[43] McNesby distinguishes between costs and expenses as, assets are capitalized costs or unexpired costs. The criterion for determining when cost becomes an expense is the matching concept.[44] Cost is the total amount of resource expended from some goods or services and expense is the amount of goods or service used during a given accounting period.[45] Cashin and Polimeni[46] distinguish expense from cost as, when benefits are received the cost becomes an expense. An expense is defined as a cost that has given a benefit and is now expired. Unexpired costs that can give future benefits are classified as assets. Expenses

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41. Deakin, E.B. and Maher, M.W., Cost Accounting, Richard D. Irwin, Inc., Homewood, Illinois, 1984, p.22.

42. Matz, Adolph & Usry, Milton, Cost Accounting : Planning and Control, South-Western Publishing Co., USA, 1980, p.40.

43. Hartley, Ronald V., Cost and Managerial Accounting, Allyn and Bacon, Inc., USA, 1983, p.27.

44. McNesby, E.J., "Basic Cost Concepts and Terminology", Quated by Goodman, S.R. and Reece, J.S., Controller's Hand Book, Down Jones - Irwin, Illinois, 1978, p.78.

45. Heitger, L.E., Matulich, S., and Var, T., Managerial Accounting, McGraw-Hill Ryerson Limited, Canada, 1983, p.49.

46. Cashin, James A., and Polimeni, Ralph S., Cost Accounting, McGraw-Hill International Book Company, London, 1981, p.19.

are matched to revenues to determine met income or loss for a period. In product costing, it is often necessary for the accountant to make a distinction between expense and loss.[47] As per G. Shillinglaw,[48] costs fall into two categories; expenses and losses. An expense is a cost that is judged to have expired during the specified time period in the creation of revenues. A loss is a cost that has expired during the period but with no offsetting benefit or connection with the creation of revenue.

Yorston, Smyth and Brown refer to cost as, the sum of the expenditures.[49] So, it can be stated that the word cost is related to total expenditure i.e., total cost is equal to total expenditure. All expenditure can again be divided into (i) Capital Expenditure and (ii) Revenue expenditure. Capital expenditure treated as asset and revenue expenditure is termed as expense. Therefore, cost includes both expenditures and expenses. Capital expenditures are unexpired cost and revenue expenditure are expired cost. Again expired cost can be grouped into expense and loss. G. R. Crowningshield presented a chart which classified costs, expenses and losses.[50]

In fine, the researcher tries to present and explain cost by the following chart showing the flow of cost, expense and loss.

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47. Crowningshield, Gerald R., Cost Accounting: Principles and Managerial Applications, Houghton Mifflin Company, Boston, 1979, p.9.

48. Shillinglaw, Gordon, Cost Accounting : Analysis and Control, Richard D. Irwin, Inc., Illinois, USA, 1961, p.54.

49. Yorston, Smyth, and Brown, Advanced Accounting, quoted by Bhabatosh Benerjee, "Cost Accounting", The World Press Private Ltd., Calcutta, 1981, p.3.

50. Crowningshield, Gerald R., Cost Accounting : Principles and Management Applications, (Houghton Mifflin Company, Boston, 1979), p.10.

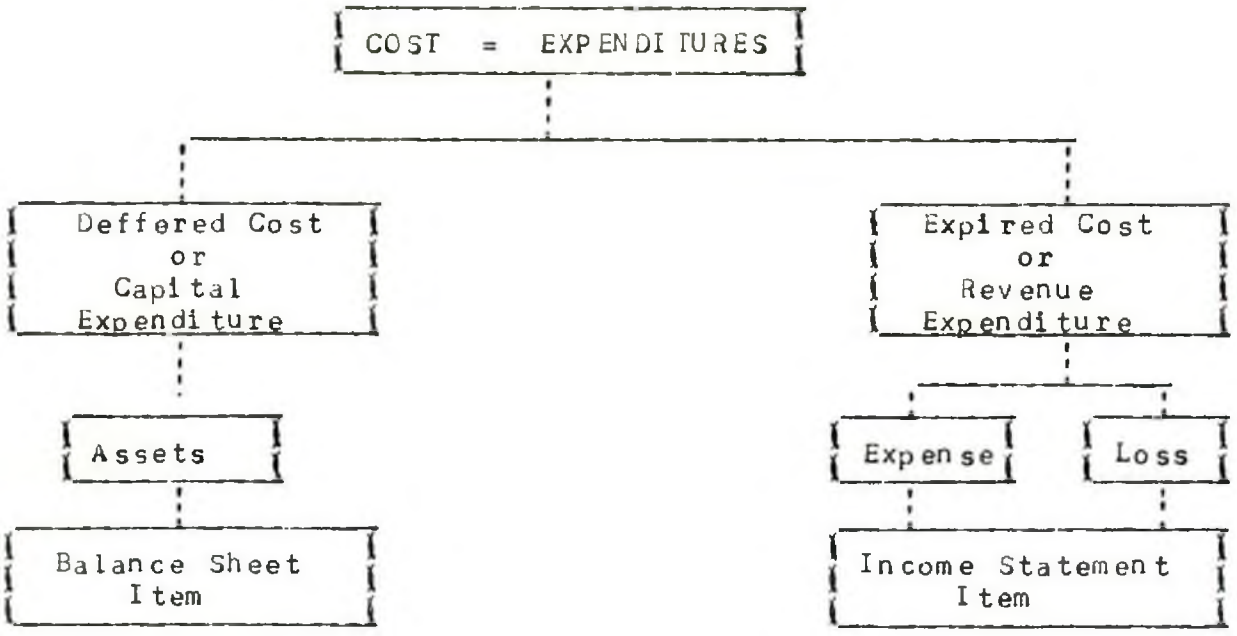

Chart: 2.01

2.03.4 CLASSIFICATION OF COSTS

There is no hard and fast rule for cost analysis and classification. Various people look at the term 'Cost' from various angles.[51] Cost can be classified according to the need of the objective. Depending on the objective to be accomplished, there are different ways of classifying costs.[52] Costs are divided, allocated, reallocated and merged until components are no longer accessible for managerial planning and control.[53] The collection, presentation, analysis and classification of cost is recommended for the development

51. Mussowir, M.A., Commentary on "Cost Audit" seminar sponsored by the ICMAB, Dhaka, December 14, 1985, p.76.

52. Gray, Jack and Ricketts, Don, Cost and Managerial Accounting, McGraw-Hill Book Company, New York, 1982, p.17.

53. Geetz, Billy E., "The Role of Costs in Managerial Planning and Control", quoted by Carroll, Phil, How to Control Production Costs, McGraw-Hill Book Company Inc., New York, 1952, p.27.

of cost data for planning profit by means of budgets, controlling, measuring annual or periodic profit, establishing selling price and pricing policy and managerial decision-making. According to Matz and Usry,[54] cost can be classified into the following eight categories:

1. By the nature of the item (a natural classification),
2. With respect to the accounting period to which they apply,
3. By their tendency to vary with volume or activity,
4. By their relation to the product,
5. By their relation to manufacturing departments,
6. According to their nature as common and/or joint costs,
7. For planning and control, and
8. For analytical process.

However, cost can be classified in greater details and in various ways to suit our purposes. Such as:

A. On the basis of time:

i) Historical cost,
ii) Pre-determined cost,
iii) Estimated cost,
iv) Standard cost,
v) Current cost.

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54. Matz, Adolph, & Usry, Milton, Cost Accounting: Planning and Control, South-Western Publishing Co., USA, 1980, pp.43-44.

B. On the basis of elements:

i) Material cost,

ii) Labour cost,

iii) Expenses or overhead cost.

C. On the basis of functions:

i) Production cost,

ii) Administration cost,

iii) Selling and distribution cost,

iv) Research and development cost,

v) Pre-production cost.

D. On the basis of cost statements:

i) Prime cost,

ii) Factory cost or works cost,

iii) Production cost,

iv) Selling cost.

E. On the basis of behaviour:

i) Fixed cost,

ii) Variable cost,

iii) Semi-fixed or semi-variable cost.

F. On the basis of controllability:

i) Controllable cost,

ii) Uncontrollable cost.

G. On the basis of traceability:

i) Direct cost,

ii) Indirect cost.

H. On the basis of normality:

i) Normal cost,

ii) Abnormal cost.

I. On the basis of charge:

i) Product cost,

ii) Period cost.

J. On the basis of management information:

i) Marginal cost,

ii) Differential cost,

iii) Uniform cost,

iv) Opportunity cost,

v) Replacement cost,

vi) Imputed cost,

vii) Sunk cost,

viii) Out of pocket cost,

ix) Committed cost,

x) Conversion cost,

xi) Common cost,

xii) Joint cost,

xiii) Avoidable cost,

xiv. Unavoidable cost,

xv Capital cost,

xvi. Deferred cost,

xvii. Expired cost,

xviii. Recurring cost,

xix. Operating cost,

xx. Relevant cost,

xxi. Irrelevant cost.

2.04.1 COST CONTROL

Before discussing the term cost control, it is necessary to understand the basic concept of control in relation to cost. The dictionary meaning of the word 'control' is regulation of the activities. We can form a more clear idea if we go through the views expressed by various writers. The term 'control' is some what loosely employed in the management literature.[55] Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of an organisations objectives.[56] Control is a dynamic management function comprising of four elements of action, feedback, evaluation and adjustment.[57] Accounting has now assumed new responsibilities

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55. Eilon, Samuel, Management Control, Pergamon Press, Oxford, 1979, p.14.

56. Anthony, Robert N., Management Accounting Principles, Richard D. Irwin, Inc., Homewood, Illinois, 1970, p.307.

57. Sherlekar, S.A., Industrial Organisation and Management, Himalaya Publishing House, Bombay, 1979, p.385.

and it is now an instrument of control — an assisting hand to management.[58] Accounting is presently called as 'control' in the economy like USA, Canada etc.[59] Controlling is the final function of the managerial process.[60] Perhaps more significant, approach is controlling by the following four factors;[61] (a) Quantity, (b) Quality, (c) Time-use and (d) Cost. The modern concept of control envisages a system that not only provides a historical record of what has happened to the business as a whole but pinpoints the reasons why it has happened and also the system should enable managers to identify trends — in costs, in markets, in all aspects of the business — and so afford a guide for future action.[62] Accounting control is concerned both with the discovery of deviations and their prompt minimization.[63] The term 'control' appears often in key functions of business. We speak of: Production Control, Quality control, Budgetary control, Safety control, Labour control, Inventory control. Then there are outside the business word: Currencycontrol, Traffic control, Pest control, Arms control, Land control, Heat control, Government control, Rent control, Birth

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58. Haque, Mohammad Nurul, "Accounting - An Instrument of Control", Management Development, BMDC, Dhaka, Vol.6, No. , 1977, p.52.

59. Paul, Pradip Kumar, "The Changing Profile of the Accounting Functions - A Bird's Eye View", The Accountant, The Bangladesh Chartered Accountants Chatra Parishad, Dhaka, 6th issue, 1985, p.35.

60. Burke, Ronald S., ICPM : Administrative Skills for the Manager., Dow Jones — Irwin, Homewood, Illinois, 1983, p.137.

61. Terry, George R., A Guide to Management, Richard D. Irwin, Inc., Homewood, Illinois, 1981, p.118.

62. Dale, Ernest, Management : Theory and Practice, McGraw-Hill Book Company, New York, 1973, p.445.

63. Onsi, Mohammed, "Quantitative Models for Accounting Control", The Accounting Review, April 1967, pp.321-30, Quoted in 'Information Analysis in Management Accounting' edited by Anderson, D.L., and Ram, D.L., John Wiley ' Sons, New York, 1978, p.404.

control and many others.[64] The term Accounting Control should be understood in the context of Accounting being used as an instrument of control and not as an automatic controller.[65] By control is meant getting the lowest possible unit cost figures by knowing what the cost figures are, what they should be, and why there is difference between predetermined or estimated and actual costs.[66] We talk of controlling inventories, expenses, yields, shrinkage, spoilage, shortages, quality, overhead, wages and so forth.[67] According to R.C. Davis there are 8 control functions.[68] These are:

1. Routine planning.
2. Scheduling.
3. Preparation.
4. Dispatching.
5. Direction.
6. Supervision.
7. Comparison, and
8. Corrective action.

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64. Rathe, Alex W., Management Controls in Business, the proceedings of a symposium held at System Development Corporation, Santa Monica, California, July 29-31, 1959.
65. Magee, C.C., Financial Accounting and Control, George Allen and Unwin Ltd., London, 1968, p.116.
66. Neuner, John J.W., Cost Accounting : Principles and Practice, Richard D. Irwin, Inc., Illinois, USA, 1952, p.570.
67. Fitzmaurice, E.F., "The Essence of Control - what it is and who does it", The Controller, The Controllers Institute of America, Inc., New York, November 1950, p.102.
68. Davis, Ralph Currier, Industrial Organization and Management, Harper & Brothers, New York, 1957, p.127-28.

Famous academician of Columbia University, G. Shillinglow recognize five elements of control which are:

1. Scheduling.
2. Development of standards.
3. Direction and supervision.
4. Comparison of results.
5. Corrective action.

To control in the management sense, is to ensure that the instructions issued, or the plan of operation, has been carried upto effect. The process of control is the measurement of performance by comparison with instruction or programme, or plan.[70] According to W.H. Newman,[71] controlling involves the establishment of standards, comparison of actual results against the standard, and necessary corrective action when performance deviates from the plan.

A military tactical control has a definite beginning and whereas the management control process relates to a recurring cycle of operations.[72] According to an Indian academician, B.K. Basu,[73] in a broad sense the anatomy of internal control system can be stated as:

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69. Shillinglow, Gordon, Cost Accounting, (Illinois: Richard D. Irwin, Inc., 1961), p.24.
70. Milward, G.E., An Approach to Management, Macdonald & Evans, London, 1946, p.35.
71. Newman, William H., Administrative Action : The Techniques of Organisation and Management, Prentice-Hall, Inc., Euglewood Clifs, N.J., 1963, p.5.
72. Anthony, Robert N., Planning and Control Systems : A Frame for Analysis, Division of Research, Graduate School of Business Administration, Harvard University, Boston, 1965, p.56.
73. Basu, B.K., An Insight into Auditing, (Calcutta: Book Syndicate Private Limited, 1981), p.15.2.

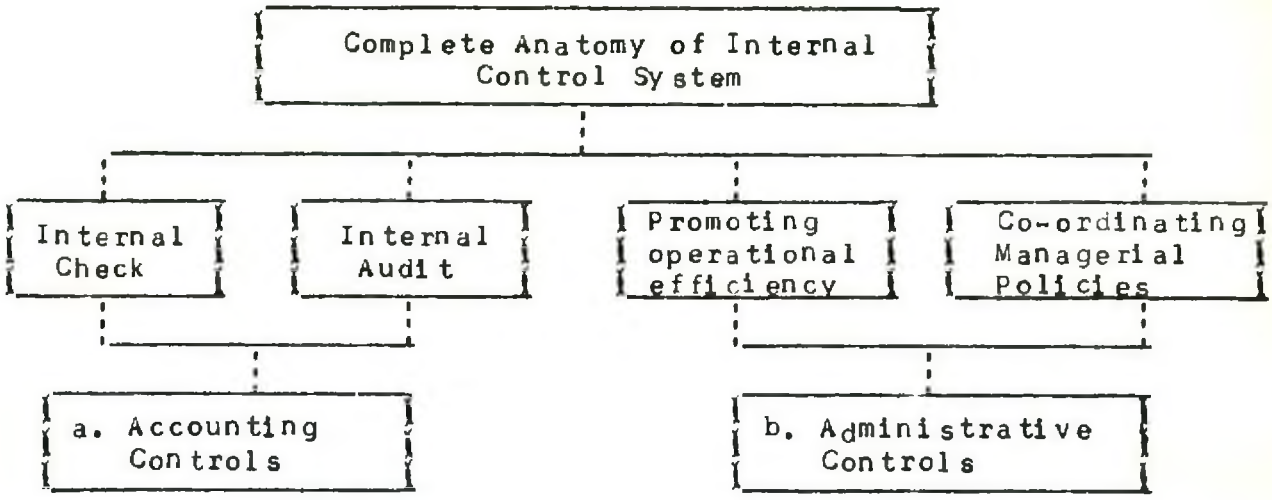

Chart: 2.02

Source: Basu, B.K. An Insight into Auditing.

Perhaps the simplest illustration of a control system is the thermostatically controlled heating system.[74] W.M. Harper[75] defined control as compelling events to conform to the plans. Max D. Richards[76] defined it as the term control means some thinking affording a standard of comparison, a means of verification or a check. As defined by G.R. Terry,[77] controlling is determining what is being accomplished, that is, evaluating the performance and if necessary, applying corrective means so that the performance takes place according to plans. Eric L. Kohler[78]

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74. Wright, M.G., The Director's Guide to Accounting and Finance, McGraw-Hill Book Co., London, 1976, p.118.
75. Harper, W.M., Cost Accountancy, MacDonald and Evans, London, 1972, p.180.
76. Richards Max D., Readings in Management, South-Western Publishing Co., New York, p.400.
77. Terry, George R., Principles of Management, Richard D. Irwin Inc., Ontario, 1977, p.481.
78. Kohler, Eric L., A Dictionary for Accountants, Fifth Edition, p.122.

defined the word 'Control' as, the process by which the activities of an organisation are conformed to a desired plans of action. Control obviously affect most, if not all, facts of the business. Without systematic control, therefore, a manager has no assurance that all elements of the organization will contribute to organizational achievement.[79] Control is the process of trying to achieve conformity between goals and actions.[80] Roscoe and Freak[81] has given the fine idea of control as the control of enterprise resources is achieved by controlling time and money, both of which are usually measured in terms of cost. Cost determination and cost control are essential in all activities of an industrial or business enterprise — including production, sales, management and all related functions. To some extent, all company employees share this responsibility.

Cost Control is an indispensable function of every business enterprise.[82] Cost accounting not only aids managers in directing day-to-day operations but also provides feedback to evaluate and control performance.[83] The main objective of costing has been shifted from cost determination and cost-providing by reconciliation to cost control.[84] With the expansion of the industrial base,

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79. Longenecker, Justin G., Principles of Management and Organisational Behaviour, Charles E. Merrill Publishing Co., Columbus, Ohio, 1977, p.465.

80. Copeland, Ronald M., and Dascher, Paul E., Management Accounting, John Wiley & Sons, New York, 1978, p.320.

81. Roscoe, Edwin Scott, and Freak, Dorman G., Organisation for Production, Richard D. Irwin, Inc., Homewood, 1971, p.344.

82. Gupta, N.S., Principles and Practice of Management, Light & Life Publishers, New Delhi, 1979, p.496.

83. Rayburn, Letrica Gayle, Principles of Cost Accounting : Managerial Applications, Richard D. Irwin Inc., Homewood, Illinois, 1983, p.3.

84. Chakraborty, Hrishikesh, Management Accountancy, Nababharat Publishers, Calcutta, 1977, p.322.

the emergence of competition and the entry of many of the firms into the export market, the need for cost control and the need for improvement of operational effectiveness were being keenly felt.[85] The beneficiaries of a good cost control system are management, labour and the consumer, the benefit being increased productivity.[86] Simultaneously efforts need to be taken to enhance the operating margin through better cost control devices, and product diversification, market research etc.[87] J.H. Fuchs[88] defined computerized cost control systems, which is a complete guide to harnessing the full potential of the computer toward increasing corporate profits and it is reasonable to expect that with an adequate allocation of resources, a well-defined program, and a concerted effort, a company can achieve its cost control objectives. Cost control has been defined by The Institute of Cost and Works Accountants of England and Wales as, "The regulation by executive action of the costs of operating an undertaking, particularly where such action is guided by cost accounting". As defined by Max D. Richards.[89] To control costs, the technique involves comparing the results of actual

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85. Habibullah, M., "Selling and Distribution Costs : A Study of Bangladesh Jute Industry", The Dhaka University Studies, Part-A, Vol. XXI, June 1973, p.15.

86. Beaman, D. Stewart, and Laryea, Henry Okai, "Financial Aspects of Departmental Management-II", The Industrial Accounting, The Pakistan Institute of Industrial Accountants, Karachi, January-March 1971, p.19.

87. Shaha, Abhinaya Chandra, "An Analytical View of Liquidity and Profitability of Rajshahi Silk Factory", The Bangladesh Accountant, The ICAB, Dhaka, Vol. 8, No.2, Oct.-Dec. 1983, p.34.

88. Fuchs, Jerome H., Computerized Cost Control System, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1976, pp.5-6.

89. Richards, Max D., Readings in Management, South-Western Publishing Co., New York, p.404.

operations with standard costs based on optimum conditions in the plant. This, in turn, presupposes some kind of cost accounting to reveal what the actual costs are and to provide some basis for determining what they should be. Cost control literally means principle and practice of controlling costs of products or services.[90] By cost control we meant to keep the cost within limits. Limits may be set by last performance or by budget or by standard.[91] Cost control is thus preventive function and acts within the framework of some target or standard.[92] In broad terms the concept of cost control refers to the most economical use of labour, materials, services and fixed assets.[93] The underlying principle of cost control is that definite responsibility must be established for accomplishments.[94]

The Encyclopedia[95] of management gives us the clear idea about cost control as the term is used in a larger and more general sense is applicable to all actions of management designed to accomplish objectives relative to the cost phase of profit maximization. In this context, then cost control would embrace all activities designed to influence costs in planning and policy determination and

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90. Bhattacharyya, D.P., "Cost Control and Cost Reduction under Inflation", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the ICMAB, Dhaka, October 30, 1981.

91. Mohiuddin, Md., "Why Cost Control and How to Control", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the ICMAB, Dhaka, October 30, 1981.

92. Ahmed, Muzaffar, "Cost Reduction and Value Analysis", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the ICMAB, Dhaka, October 30, 1981.

93. Battey, J. (Edited), Cost and Management Accounting for Students, Allied Publishers Private Limited, New Delhi, 1980, p.26.

94. Voitsberger, D.M., "Standard Costs and Cost Standards", Modern Management, August, 1945.

95. Heyel, Carl (edited), The Encyclopedia of Management, Van Mostrand Reinhold Company, New York, 1982, p.171.

costs applicable to all phases of operations management: research, production, marketing and finance. As per Anderson and Raiborn,[96] cost control implies a comparative analysis of costs in relation to desired results and the formulation of necessary corrective actions. Irving Dlaugatch[97] defined cost control in the preface of his book as, cost control is concerned with keeping unit costs below established standards under existing conditions.

According to Backer and Jacobsen[98] an effective cost control is characterized by the following:

1. Delineation of centers of responsibility.
2. Delegation of authority.
3. Cost standards.
4. Relevance of controllable costs.
5. Cost reporting.
6. Cost reduction.

One area of supervisory responsibility that is often minimized and yet is vitally critical to success or failure of business is that of cost control.[99] As a result, cost control planning is

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96. Anderson, Henry R., and Raiborn, Mitchel H., Basic Cost Accounting Concepts, Houghton Mifflin Company, Boston, USA, 1977, p.416.
97. Dlugatch, Irving, Dynamic Cost Reduction, A Ronald Press Publication, John Wiley & Sons, New York, 1979.
98. Backer, Morton, & Jacobsen, L.E., Cost Accounting: A Managerial Approach, McGraw-Hill Book Company, New York, 1964, p.18.
99. Steinmetz, Lawrence L., and Todd, H. Ralph, First-Line Management : Approaching Supervision Effectively, Business Publications, Inc., Dallas, Texas, 1979, p.229.

becoming a more and more important part of sophisticated budgeting systems.[100] To be effective, cost control must revolve around a system of responsibility accounting.[101] Critical Path Analysis may also be used for project cost control.[102] In the field of cost control, the technique of control charts appears to offer promising results.[103]

An accounting system can serve control objectives by serving as a warning device which reports which costs departing from plan, by directing review management to the most effective point for initiating an investigation to deal with the problem, and by providing the general purpose data that can be analysed and interpreted by all levels of management for the solution of problems in cost control.[104] The aspects of control to be discussed in Flexible Budgets, Standard Costs, Internal Auditing and responsibility accounting.[105] The detailed control is obtained through a

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100. Nelson, R.E., and Goldman, H.J., "Cost Control : How to Make it work (Using the best of Zero-Base Budgeting and other Approaches)", The Hand Book of Business Problem Solving, edited by K.J. Albert, McGraw Hill Book Company, New York, 1980, p.7-13.

101. Talukder, Md. Yusuf, "Inflation Accounting for Management, Planning and Control", The Bangladesh Accountant, ICAB, Dhaka, Vol. 6, No. 1-4, July 1982 to June 1983, p.12.

102. Srinivasan, A.V., Critical Path Analysis : A System Approach, Affiliated East-West Press (Pvt.) Ltd., New Delhi, 1976, p.33.

103. Gaynor, Edwin W., "Use of Control Charts in Cost Control", NACA Bulletin, National Association of Cost Accountants, USA, June, 1954, p.777.

104. Gordon, Myron J., "Cost Allocations and the Design of Accounting Systems for Control", The Accounting Review, American Accounting Association, April 1951, p.544.

105. McCullers, Levis D., & Daniker, R.P. Van, Introduction to Financial Accounting, Melville Publishing Company, California, 1975, p.404.

co-ordinated system of standard costing and budgetary control.[106] Cost control is applied through the techniques of Budgetary Control and Standard Costing which will lead to improved efficiency, revealing variances from predetermined standards and thus providing useful tools for cost control.[107]

M. Rahman observed in his Ph.D. Thesis that the high-use style managers expressed a great concern for cost control and budget performance and there exists a general feeling of urgency for cost control and budget attainment among the high-use managers.[108] Jackson rightly stated, "Cost control has as its purpose the leading of management into a searching examination of its working plans, methods, organisation, physical facilities and manpower, in order that defects and weakness may be discovered and corrected".[109] Cost control, used in a broad sense, aims at reducing cost and increasing productivity.[110]

In Bangladesh, cost control methods are not effectively used. According to a survey made in 1975, "cost control is the most neglected aspect in the existing circumstances under which frequent

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106. Khalid, A.B.M., "Effective Management through Accounting Aids", The Dhaka University Studies, Part-A, Vol.XXIV, June 1976, p.218.

107. Ahmed, Z.U., "Cost Production with special reference to Jute Mills", The Business Review, Vol. IV, July-December, 1978, Faculty of Commerce University of Dhaka, Dhaka, p.76.

108. Rahman, Mawdudur, "An Empirical Investigation into Management Use of Accounting Information and the Influence of Selected Job related traits and Organizational Correlates", unpublished Ph.D. Thesis, Manchester Business School, April 1976, p.112.

109. Jackson, J. Nagle, "Cost Accounting in the Education of Management", NACA Bulletin, August 15, 1946, p.1187.

110. Basu, B.K., "Cost Control", Survey, A Journal of the Indian Institute of Social Welfare and Business Management, Calcutta, p.46.

power failure, shortage of spareparts and imported materials and lack of working capital act as disrupting factors.[111] This remark is, of course, not equally applicable to all cases, yet it in an indication to the situation prevailing in Bangladesh. In those cases where competition exists in the international market like jute, paper, fertilizer etc. have to face competition and have been running at losses. Cost control methods in such cases can not help much in improving the situation. Drastic cost reduction can only save these industries.

2.04.2 COST REDUCTION

Cost reduction has been defined by The Institute of Cost and Works Accountants,[112] London, as Cost Reduction is to be understood as the achievement of real and permanent reduction in the unit costs of goods manufactured or services rendered without impairing their suitability for the use intended. Cost reduction is neither technical nor commercial but it is a discipline which starts with a premise that there is always a better way of doing a thing.[113] Dynamic cost reduction is concerned with reducing costs but allowing flexible standards.[114] Cost reduction drive is a feature of

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111. Mondol and others, "A Survey of Cost Control Methods Used by Industrial Units in the Khulna Revion", Department of Accounting, Rajshahi University, 1975, p.7.

112. Institute of Cost and Works Accountants, Cost Reduction, London, 1968.

113. Chandra, Durgesh, Dynamics of Productivity, A Volume in Profit Maximization Series, South Asian Publishers Pvt. Ltd., New Delhi, 1980, p.77.

114. Dlugatch, Irving, Dynamic Cost Reduction, A Ronald Press Publication, John Wiley & Sons, New York, 1979, p.31.

the American competitive system which to explore cost savings possibilities.[115] The other way to higher profitability, which is quite common in a competitive economy, is to reduce the cost of manufacturing and a greater degree of mechanisation is possible with reduction of unit cost.[116] Although few writers mentioned separate chapter in his writing as 'How costs can be reduced'.[117] International comparisons of the experience with heavy industry suggests various cost-reducing factors operating in essentially different spheres.[118] Often and frequently the government official asked the concerned authorities to reduce production costs and wastages.[119] K.B. Hoque suggested some ways in reducing the cost of production of sugar.[120].

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115. Peirce, James L., "The Budget Comes of Age", The Harvard Business Review, May, 1954, p.157. (This article was based on a talk given at the Finance Conference of the American Management Association, New York, November 20, 1953).

116. Azim, Dr. Engr, M. Anwarul, Hasem, Engr. Syed Masud, and Khan, Engr. Shamsul Hoque, "Industrial Operation Towards High Efficiency", Management Development, BMDC, Dhaka, Vol. 10, No. 1, 1981, p.15. (This paper was presented at the International Seminar organised by the Institute of Engineers, Bangladesh, on the occasion of its Silver Jubinee Convention, Dhaka, 18-20 December, 1980.

117. Parkinson, C.N., and Rustomji, M.K., Realities in Management, IBM Publishing Company, Bombay, 1983, p.188.

118. Vries, Barend A. de, "High Cost of Industry in Developing Countries - Causes and Remedies", Modern Management, (the then) East Pakistan Management Association, Chittagong, January-April, 1970, p.22.

119. The DCMLA and Minister Industries, Commerce, Jute and Textile, Air-Vice-Marshal Sultan Mahmud said while he visited the local Jessore Jute Mills an Enterprise of Bangladesh Jute Mills Corporation.

120. Hoque, Khandoker Bazlul, "Some thoughts on the Development of Sugar Industry in Bangladesh : Problems and Possibilities", The Dhaka University Studies, Part-C, Vol. V, No. 1, June 1984, p.147.

In short, cost reduction would mean maximisation of profits by reducing cost through economies and savings in costs of manufacture, administration, selling and distribution, Products, processes, organisation and method, materials, labour and personnel, overheads etc. are continually scrutinished in order to improve efficiency and reduce costs by continuous analysis, criticism and necessary correction. Cost reduction based on the philosophy that every human action can be improved by continuous effort.

M. Rahman observed that high-use managers consider a larger number of goals as formal goals than the low use managers include detailed criteria such as 'Cost Reduction'.[121] Mr. Zahir Uddin Ahmed,[122] Finance Director, Bangladesh Jute Mills Corporation, has suggested that cost reduction is of great importance to jute industry. He suggested productivity increase of the industry as a measure of cost reduction. He made particular reference to the controllable items of individual expenditure. He assessed the attainable scope of cost reduction of all item at 10%. He made the specific reference to cost control through the technique of budgetary control and standard costing. He, however, felt that any scheme of cost control must get the full support of the highest level of management. He felt that the whole procedure of cost reduction is essentially one of finding out of facts scrutinizing and analysing them to discover sources of high cost and waste.

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121. Rahman, Mawdudur, "An Empirical Investigation into Management Use of Accounting Information and the Influence of Selected Job related Traits and Organizational Correlates", unpublished Ph.D. Thesis, Manchester Business School, April, 1976, p.233.

122. Ahmed, Zahir Uddin, "Cost Reduction with reference to Jute Mills", Business Review, July-October, 1978.

2.04.3 COST CONSCIOUSNESS

According to K.G. Mohiuddin,[123] Bangladesh has been passing under an inefficient and unsatisfactory managerial costing system and in his paper approaches to understanding it would be to have a close look at 'Making Management Cost Conscious' with reference to Bangladesh. Standards and budgets have directed management to become cost conscious.[124] A more effective approach is to show positive reasons to the employees to be cost-conscious.[125] Management decision-making being a forward looking affairs, future costs stand as principal costs in projecting future course of action. There are two broad roads in the journey of cost consciousness. They are: "Cost Control" and "Cost Reduction".[126] The motto of the management is to achieve optimum benefit with the minimum cost. In the context of the above back ground, a const-conscious management must look forward and deeply think about the probable nature, direction and magnitude of the management in the near and off future. According to M. Ahmed,[127] the country is now facing high inflationary trend and soaring prices. Under the present circumstances, it has become vital to implement the cost control and cost reduction

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123. Mohiuddin, Kazi Golam, "Making Management Cost-Conscious", The Accountant, Bangladesh Chartered Accountancy, Chatra Parishad, Dhaka, Vol. 1, 1975, p.22.

124. Abdullah, A.S.M., "Analysis and Evaluation of Standards and Budgets as Cost Control Devices", The Dhaka University Studies, Part-C, Vol. 1, No.2, June 1980, p.9.

125. Habibullah, M., "Making Employees Cost-Minded", paper presented in the "Cost Control and Cost Reduction" seminar sponsored by ICMAB, Dhaka, October 30, 1981.

126. Mohiuddin, Kazi Golam, "Making Management Cost Conscious", The Accountant, Bangladesh Chartered Accountancy Chatra Parishad, Dhaka, Vol. 1, 1975, p.23.

127. Ahmed, Muzaffar, "Cost Reduction and Value Analysis", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the ICMAB, Dhaka, October 30, 1981.

technique which can help to reduce the costs and thus permit the maximum scope for the optimal use of the scarce resources. More and more country becomes advanced and developed, more and more it becomes value conscious and cost conscious. The more the personnel are cost minded, the more successful a cost system will be. Being cost minded develops a keen sense of responsibility and alertness as to the most effective and profitable use of all resources which presents wastage, losses and uneconomic and inefficient use of the available resources and unltimately this is the secret of success of all personnel as national development.[128] N.N. Mallya[129] described that above all the prime need in management was as for it to be cost conscious. He further described that it should be realised that every management decision had its reflection somewhere in assets and liabilities of balance sheet, the surplus account, and the profit and loss statement. He argued that cost consciousness was not just an awareness of total cost but knowing the cost of each division, of each process or job and this must be known every month, every week, sometimes every day.

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128. Aphiluddin, Md., "Being Cost Minded", The Bangladesh Observer, Dhaka, December 9, 1986.

129. Mallya, N.N., Public Enterprises in India, (National Publishing House, New Delhi, 1971), p.71.

2.04.4 COST CONTROL VS. COST REDUCTION

Managerial Accounting has traditionally been viewed as the primary means of controlling and reducing costs.[130] Cost reduction like cost control is everyone's job.[131] According to Dobson,[132] cost control and cost reduction may both be considered to be the two aspects of the same problem, viz. Cost improvement. Cost control is a budgetary function circling round the standard costs, whereas cost reduction challenges even the standards and basically is innovative in nature.[133] Cost reduction involves a more dynamic approach since it searches all losses and diseconomies, visible or invisible, direct or consequential. While the effort for cost control is that of watchdog; the endeavour for cost reduction is that of a blood hound, as it were.[134] These control limits serve to flag good as well as poor periods of operation and the discovery of the causes for the improved operations often lead the way to permanent cost reduction.[135] The differences are summarised by the researcher which are given below:

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130. Bierman, Harold, and Dyckman, Thomas R., Managerial Cost Accounting, Macmillan Publishing Co., Inc., New York, 1976, p.138.

131. Killer, I.W. and Ferrara, W.L., Management Accounting for Profit Control, McGraw-Hill Inc., New York, 1966, p.270.

132. Dobson, R.W., An Introduction to Cost Accounting, Gee & Co., London, 1971, p.

133. Chandra, Durgesh, Dynamics of Productivity, A Volume in Profit Maximization Series, South Asian Publishers Pvt. Ltd., New Delhi, 1980, p.78.

134. Chatterjee, B.K., Accountancy and Finance for Managers, Jaico Publishing House, Bombay, 1977, pp.558-59.

135. Noble, Carl E., "Calculating Control Limits for Cost Control Data", NACA Bulletin, National Association of Cost Accountants, USA, June 1954, p.788.

	Cost Control	Cost Reduction
1.	Controlled programme	Well knit programme
2.	Preventive approach	Corrective approach
3.	Budgetary function	Innovative function
4.	Static approach	Dynamic approach
5.	Watchdog function	Blood hound function

2.04.5 HUMAN PROBLEM IN COST CONTROL AND COST REDUCTION

It is accepted by all that well-planned and well-directed cost control and cost reduction programme is not only a structure of duties, responsibilities and authority relationships but it is also as a human organisation consisting of formal and informal social groups. The approach depends upon the behaviourial sciences, particularly psychology, sociology and anthropology. Attitudes and emotions, hopes and fears, likes and dislikes of employees play a vital role in transforming the organization into an instrument of creativity and in maintaining it as an upholder of stability of cost control and cost reduction.

These problems are universal found in every country. Professor B.K. Basu[136] emphasised that the main problem which top management faces is the problem of man-management in the cost control. He also argued that 'in actual practice it becomes very difficult to control those people who affect cost'. Professor Habibullah[137] described

136. Basu, B.K., "Cost Control", Survey, A Journal of the Indian Institute of Social Welfare and Business Management, Calcutta, May 1974, p.49.

137. Habibullah, M., "Human Aspects of Accounting", The Dhaka University Studies, Vol. XXII (Part-A), 1974, pp.17-28.

the psychological problems likely to emerged if one tries to introduce sound accounting practices - financial accounting, cost accounting, and management accounting.

There is no denying the fact that managerial supervision relating to cost control and cost reduction is behaviouristic in nature and aspect of social psychology. Therefore, the term control, as pointed out earlier, is a dynamic concept and can not be regulated by a single measure; as such it give rise to many behaviourial issues which was studied by many experts.[138] Therefore, authors are found to confuse to identify its nature, behaviour and sentiment, and use the term 'a state of mind'.[139] Needless to mention, it is concerned with the concept of materiality which varies from place to place, person to person and accountant to accountant. However, as human beings are sentimental and poses a great concern for their control, it is difficult to operate for desired good but a well-conceived, well-designed and better administrative control can be applied through testing the soil of the business environment for increasing organisational productivity.[140]

138.(a) Argyris, Chvis, The Impact of Budgets on People, The Controllership Foundation Inc., New York, 1952.

(b) Stedry, A.C., Budget Control and Cost Behaviour, Prentice Hall Inc., N.J., 1960.

(c) Decoster and Fertakis, "Budget Induced Pressure and its relationship to Supervisory Behaviour", Journal of Accounting Research, Vol. 6, No. 2, Autumn, 1968, pp.237-46.

(d) Schiff and Lewin, "The Impact of People and Budgets", The Accounting Review, Vol. 45, April 1970, pp.259-68.

(e) Becker S. and Green, D., "Budgeting and Employee Behavior", Reading in Cost Accounting, Budgeting and Control, Bombay, D.B. Taraorevale Sons & Co., Private Ltd., 1970, pp.378-98.

139. Moore, Franklin G., Manufacturing Management, Richard D. Irwin Inc., Ontario, 1969, p.632.

140. Manik, M. Waheeduzzaman, "Managing Human Resources for Organizational Productivity: A Diagnostic Approach", Management Development, The Bangladesh Management Development Centre, Dhaka, Vol. 13, No. 2, 1984, p.28.

Eckles, Carmichael, and Sarchet have emphasized the benefit that people are more important than systems or physical resources. The attitudes, actions, and reactions of people from hourly employees upto the chief executives — contribute more to enterprise success or failure than do the mechanistic elements of the operation. Machine-to-machine operating systems normally have a logic that makes them easier to control than humanistic systems.[141] In short, development of voluntary co-operation, participation, sense of responsibility and allowing self-control are the best means for effective managerial controls.[142] Too much pressure breeds frustration and irrational behavior usually is a consequence of frustration. A number of significant studies of human problems in control highlight a considerable degree of negative reaction to control. D. Chandra[143] argued that managers are human beings and are found to fit into the various styles of working, such as:

1. The pragmatic,
2. The cautious,
3. The bureaucratic,
4. The adventurer,
5. The technocratic,
6. The elitist,
7. The stylistic,
8. The specialist,
9. The professional.

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141. Eckles, R.W., Carmichael, R.L., and Sarchet, R.R. Supervisory Management, John Wiley & Sons, New York, 1981, p.97.

142. Sherlekar, S.A., Industrial Organisation and Management, Himalaya Publishing House, Bombay, 1979, p.167.

143. Chandra, Durgesh, Dynamics of Productivity, A Volume in Profit Maximization Series, South Asian Publishers Pvt. Ltd., New Delhi, 1980, p.248.

As per Amanullah,[144] three major human problems can be significant.

1. Problem of change in the social structure,
2. Problem of control and communication,
3. Problems in the adjustment of the individual to the structure.

As a matter of fact, human beings live in a rigidly controlled world with physical, psychological, social and moral laws holding them in firm grasp. Arora and Soni[145] argued that cost reduction programme has its dangers, which should be kept in mind while planning it. The dangers are summarised as follows:

1. Cost-shifting,
2. Re-growth of costs,
3. Decline in morale,
4. Discrediting a system,
5. A panic measures.

A.M. Chowdhury[146] in his writing offered a policy making tool to the management and the policy maker with a highly dependable, policy framing and bargaining tool, it shows the right approach, in direction at least, for maintaining a smooth labour-management

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144. Amanullah, Mohammad, "Human Problems of Management, Management Development, BMDC, Dhaka, Vol. 1, No. 4, 1972, p.35.

145. Arora, S.P., and Soni, T.S., Cost Accounting, Pitambar Publishing Company, New Delhi, 1983, pp.4.166-67.

146. Chowdhury, A. Momin, A Method for Designing an Incentive System for the Jute Industry of Bangladesh in Particular and for the Nationalized Industries in General (Ph.D. Thesis, unpublished), University of Dhaka, Dhaka, 1981, p.92.

relations and for minimizing wild labour problems — so suicidal for the economy and the nation. It is the recommendation of a seminar that in every industry at least one industrial psychologist should be employed to help and solve human problems in industry.[147]

In conclusion it may be said that the human relations movement started as a reaction against the impersonal and mechanical behaviour of bureaucracy and the scientific management era. Money, machinery, methods and equipment without competent human resources are useless. The master key to productivity ultimately lies in the recognition of human values in industry. To a manager, human relations is the integration of people into a work situation that motivates them to work together productively, co-operatively, and with economic, psychological and social satisfaction.

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147. Seminar on "Motivation and Industrial Productivity in Bangladesh" held in September, 1974, University of Dhaka, Dhaka.

2.05 NEEDS AND SIGNIFICANCE OF COST CONTROL AND COST REDUCTION

Minimisation of cost is as old as the human history. We have to be conscious and prudent enough before incurrence of costs in order to retain our survival and freedom. The following quotations from some noted scholars will throw light on the needs and significance of cost control and cost reduction. Every family, manufacturing and commercial organisation, government and any other organisation including social organisation must think at least once if not more before commitment of any expenditures.[148] Cost minimisation is needed everywhere even in the judiciary. In any society, the basic objectives of the judiciary are to safeguard people's right, to settle disputes among the members of society and to ensure a social framework based on justice. A major pre-condition to all these is an efficient legal system which in turn, depends on cost-minimizing expeditious justice.[149] Cost minimization is essential for competitive purposes. Millions of consumers, making their choices, creates demand for the goods most wanted. Factories making these goods expand and prosper. Goods not wanted because of high price, poor quality, bad design, etc. go unsold and companies making them improve their price and product or go out of business. It is the consumer, not the government, who determines what shall be made, in what quantity, at what price in relation to cost and competition forces producers to reduce cost.[150] Customers

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148. Miah, Md. Uttam Ali, "Why Cost Control and How to Control", paper presented in 'Cost Control and Cost Reduction' Seminar sponsored by ICMAB, Dhaka, October 30, 1981.

149. The Bangladesh Observer, "Time, Cost and Justice", Editorial, Dhaka, February 28, 1986.

150. American Economic Foundation, "Lower Costs through Human Engineering", pp. 10-11.

are insisting upon significantly higher quality, greater reliability, factor delivery and more product variety. These days management are facing problems of survival due to keen competition and only those concerns survive which are in a position to keep their costs minimum. It is rememberable that no war, no strike, no depression can so completely and irrevocably destroy an established business as new and better methods in the hands of an enlighted competitor.[151] A formidable problem in the economic development of Bangladesh is the high cost of production of its industries.[152] Cost reduction and cost control are the two important tools in the hands of the nationalised industries as these are in the hands of the government.[153] Countries like Taiwan, South Korea and Singapore as well as the industrialized countries like the USA have been striving to improve the management of industries with a view to reducing cost of production and making them competitive.[154] In the Textile Mills in Bangladesh, proper classification and analysis of costs were not made for the purpose of controlling cost and reducing wastages.[155] A good cost reporting system thus provides invaluable tool of control for all levels of management in increasing effectiveness of

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151. Copell, Don F., Work Simplification Training, American Management Association Production Series 157, 1945.

152. Habibullah, M., "Making Employees Cost-Minded", paper presented in the 'Cost Control and Cost Reduction' seminar sponsored by the ICMAB, Dhaka, October 30, 1981.

153. Hassan, Md. Nurul, "Cost Control and Cost Reduction under Inflation", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the ICMAB, Dhaka, October 30, 1981.

154. The Bangladesh Observer, "Cost of Production" Editorial, Dhaka, November 11, 1985.

155. Abdullah, A.S.M., "A Critical Evaluation of Integrated Accounting System Practised in Textile Mills in Bangladesh", The Bangladesh Accountant, ICAB, Dhaka, Vol. 3, No. 4, June 1979, p.7.

operations and for reducing costs.[156] Whatever be the level of output, a firm should select a factor combination that keeps its cost outlay for that output as low as possible.[157] Our productive sectors have to meet the growing demand, they have to be put not only on modern lines but also on a cost-efficiency plinth.[158] It is important to remember that valuable savings can be made through Low Cost Automation which has been defined as a replacement of muscular and mental effort by the use of simple pneumatic, electric, hydraulic and mechanical components in manufacturing and assembly operations.[159] An effective cost control and cost reduction programme is the only way out of the present losing state of the industry.[160]

The ultimate result of the cost control and cost reduction is the higher productivity. Higher productivity has the effect of generating prosperity for the business, the industry, the worker, the consumer and the nation, as a whole. Nationalised industrial sector in our country badly needs such drastic measures for control and reduction of cost in order to improve their financial health.

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156. Abdullah, A.S.M., "Cost Report as an Aid to Cost Control", The Bangladesh Accountant, ICAB, Dhaka, Vol.1&2, July-Dec. 1981, p.16.

157. Ali, Md. Omar, "Least Cost Production - with reference to Bangladesh", Maneggiare, Department of Management, University of Chittagong, 1979-80, p.87.

158. The Bangladesh Observer, Cost and Competition, Editorial, Dhaka, January 27, 1987.

159. Gedye, Rupert, Works Management and Productivity, Allied Publishers, New Delhi, 1980, p.238.

160. Husain, Syed Masud, Cost Audit : A Study in the Jute Industry of Bangladesh, Research Report, Bureau of Business Research, University of Dhaka, 1985, p.60.

2.06 TOOLS AND TECHNIQUES FOR COST CONTROL AND COST REDUCTION

Many management techniques are in regular use to facilitate the work of cost control and cost reduction. The various techniques and tools used for achieving cost reduction are practically the same which have been suggested for cost control. B.E. Lipman,[161] in his book tested 1200 ready-to-use cost reduction techniques that could be applied to any company, no matter how large or small. All of these techniques are organised into a logical, systematic attack on costs and equipped to detect excess costs early, and to deal with them swiftly and effectively. According to Bhattacharrya,[162] these techniques are fundamental and applicable to both cost reduction and cost control. The mechanism and techniques of cost reduction are also varied. Different techniques are applied in the different functional areas.[163]

A planned attack on costs must be made using all or some of the techniques. The technique or techniques to be selected for each organisation will depend on the circumstances relevant to its operation. The techniques requires special attention and details discussions.[164] Professor B.K. Basu,[164] argued that the techniques of control varies widely from firm to firm or concern to concern,

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161. Lipman, Burton E., Successful Cost Reduction and Control: The Probe Systematic Approach, (Englewood Cliffs: Prentice-Hall, Inc., 1978).

162. Bhattacharrya, D.P., "Cost Control and Cost Reduction under Inflation", paper presented in the 'Cost Control and Cost Reduction', seminar sponsored by the ICMAB, Dhaka, October 30, 1981.

163. Chakraborty, Hrishikesh, Management Accountancy, Nababharat Publisher, Calcutta, 1979, p.329.

164. Basu, B.K., "Cost Control", Survey, A Journal of the Indian Institute of Social Welfare and Business Management, Calcutta, May 1974, p.47.

because a particular technique which may be found suitable in a particular case may not be considered indispensable in other cases, that's why it sometimes becomes a vexed problem in management.

The following are some of the techniques of this nature applied in different organisations:

1. Budgetary control,
2. Standard costing,
3. Value analysis or value engineering,
4. Break even analysis,
5. Cost-volume-profit analysis,
6. Work study and organisation and method procedure.
7. Standardisation,
8. Simplification and variety reduction,
9. Coding and classification,
10. Automation,
11. Operational research,
12. Market research,
13. Business forecast,
14. Control of capital expenditure,
15. Productivity ratio,
16. Responsibility accounting,
17. Management by exception,
18. Material control,
19. Labour control,
20. Overhead control,

21. Economic batch quantity or economic order quantity,
22. ABC analysis,
23. Improvement in design,
24. Substitute material utilization,
25. Quality control,
26. Production planning and control,
27. Inventory control,
28. Perpetual inventory,
29. Job evaluation and merit rating,
30. Training scheme,
31. Zero defect technique,
32. Quening theory.

2.07 BASIC REQUIREMENTS OF COST CONTROL AND COST REDUCTION

Successful launching of the programmes of cost control methods and cost reduction techniques in the nationalised industrial sector is the collective responsibility of government, sector corporations and the Manager/Administrator at enterprise level.[165] Cost control and cost reduction works best when the following measures are adopted and these may be called, "Essentials for Success" or "Basic Requirements" of cost control and cost reduction.

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165. Shahidullah, Md., "Method of Cost Control and Cost Reduction in the Nationalised Industrial Sector", The Accountant, Bangladesh Chartered Accountancy Chatra Parishad, Dhaka, Vol. 1, 1975, p.20.

(i) Organisational Plan: For an effective system of cost control and cost reduction, the firm should have a definite plan of organisation. Authority and responsibility of each executive should be clearly defined. Every one should have his defined rights, powers, duties, responsibilities and obligations. So, he shall be charged or rectified accordingly. While introducing the system of cost control and cost reduction, the first step is to decide as to how it is to be developed within the organisational set up. Top managers also design an organization structure, which can be defined as an arrangement of lines of responsibility within an entity. Kohler's, "A Dictionary of Accounts" defines responsibility as, "the obligation prudently to exercise assigned or imputed authority attaching to the assigned or imputed role of an individual or group participating in organizational activities or decisions".[166]

The N.A. (C) A. Research series no. 22, says, "A responsibility may be defined as an organizational unit having a single head accountable for activities of the unit".[167]

Responsibility accounting is defined by Charles T. Horngren with various dimension as, "Responsibility accounting, profitability accounting, or activity accounting systems recognize various decision centres through out an organization and trace costs (and revenues, assets, and liabilities, where pertinent) to the

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166. Kohler's, A Dictionary of Accountants.

167. The N.A. (C) A., Research Series no. 22, quoted by Matz and Usry, "Cost Accounting", South-Western Publishing Co., Ohio, 1982, p.289.

individual managers who are primarily responsible for making decisions about the costs in question".[168]

Responsibility accounting is based on a classification of managerial responsibilities at every level in the organisation and defined by Matz and Usry[169] as, "Responsibility accounting is a program engulfing all operating management for which the accounting, cost, or budget divisions provide technical assistance in the form of daily, weekly, or monthly control reports".

As the organisation chart is the backbone of any responsibility accounting system and the ultimate success of the programme, management must provide a complete classification of the objective and responsibilities of all levels of the organisation chart. An organisation chart shows the primary divisions and sub-divisions of a manufacturing concern. It may be used as a basis for classification of costs. The manager is accountable for the results via responsibility accounting. So, organisation plan as well as responsibility accounting is a pre-requisite for a successful cost control and cost reduction programme.

(ii) Organisational Goals: Management is directly involved with organisational goals. It is the function of the management to translate broad goals into operational objectives and provides means of control to measure the extent of accomplishment. Objectives are those ends which the organisation seeks to achieve by

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168. Horngren, Charles T., "Cost Accounting : A Managerial Emphasis" Prentice-Hall of India Private Ltd., New Delhi, 1983, p.143.

169. Matz, Adolph, and Usry, Milton F., "Cost Accounting : Planning and Control", South-Western Publ[illegible] Co., Ohio, 1982, p.299.

i s existence and operations. Effective objectives are measurable, attainable and consistent with the firm's resources. A managerial objective is the intended goal which prescribes definite scope and suggests direction to efforts of a manager.

The concept of a goal has acquired a variety of meaning depending on the perspective of the writer. Kast and Rosenzweig defines goals as, "Simply stated, goals represent the desired future conditions that the organization strives to achieve. In this sense, goals include missions, purposes, objectives, targets, quotas and deadlines".[170] Goals focus the attention of participants on actions that are organizationally relevant to cost control and cost reduction. It is sometimes used to legitimize and justify the role of the organisation in society.

(iii) Cost Centres: The Institute of Cost and Management Accountants, London, has defined cost centre as, "A location, person or item of equipment (or group of these) for which costs may be ascertained and used for the purposes of cost control".[171] Cost should be collected by each area of responsibility and reporting of efficiency or inefficiency displayed by each section should be prompt. Thus it is facilitate responsibility through cost centres". Cost centres are also termed as, "Responsibility Centres". Cost centre may be called cost planning which is essential for an effective cost control and cost reduction. There is no

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170. Kast, Fremont E., and Rosenzweig, James E., "Organisation and Management", McGraw-Hill Book Company, New York, 1979, p.151.

171. The Institute of Cost and Management Accountants, London.

denying the fact that for effective cost control what is more important is to study or scrutinise different dimension of cost planning.[172]

The type, size and number of cost centres in an undertaking will depend upon the nature and size of the business, attitude of the management towards cost control and cost reduction.

(iv) Performance Reports: It is a well-designed information system providing measurements of activities and costs. These information may be presented and communicated to the management through reports, charts and groups. Sometimes these information called management information system (MIS). These reports generally show the comparisons of budgets with actual results. The deviations of actual results from budget are called variances. The unfavourable variances require management attention for necessary correction. The predetermined or budgeted items form the foundation for comparison with actual results leading to the VARIANCE ANALYSIS OR MANAGEMENT BY EXCEPTION principle. Thus variance analysis, in fact, plays a dynamic role in standard costing for the reduction and control of cost. Management do not spend time and effort searching through unnecessary information, but can concentrate their attention on important matters. It is only on the points of exceptions that they have to concentrate. That is why, the technique is known as "Management by exceptions". Through the issuance of performance reports, advises all levels of management where and

172. Matz, Adolph and Usry, Milton F., "Cost Accounting : Planning and Control", South-Eastern Publishing Co:, Ohio, 1976, p.11.

what jobs or tasks require corrective action emphasizing the exceptions to or deviations from a predetermined plan expedites managerial control and ignoring areas that are running smoothly.

(v) Judgement: The performance reports should be used with great care for making a judgement about the efficiency or inefficiency of organisational goals and cost centres. The factors leading to exceptionally good or bad performance should be enquired into and appropriate remedial action should be taken. Any failure or inefficiency brought to light should not be taken in a fault finding, condemning, or vindictive attitude by the upper level of management. A right atmosphere should be created for the lower level to come forward boldly with concreate suggestions, which may involve admission of mistakes and even self-criticism.

(iv) Motivation: Good performance should be rewarded and bad performance should attract the necessary disincentive. So, workers should be motivated towards better performance to reduce and control cost. Motivation refers to the process or factors or motives that influence people to act i.e. the willingness to work wholeheartedly and sincerely for the prosperity of the organisation. Glueck defines motivation as, "Motivation is the inner state that energizes, channels and sustains human behaviour".[173] The employees work in the organisation to satisfy their needs in exchange of their efforts. It is the duty of the organisation to clearly diagnose what the employees want out of their works and is essential for

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173. Glueck, William F., "Management", The Dryden Press Hinsdale, Illinois, 1980, p.161.

stimulating their interest for high level performance effectiveness. To motivate the staff, it is necessary to properly train and educate them. Incentives should be offered for better performance and suitable rewards in the form of increment in salary, promotion, or raise in status should be given for such new ideas put forth by the employees, which ultimate results in increased productivity and cost minimization.

A study made in 1969-70 showed that managers in Bangladesh want: promotion 16%, participation 20%, fairness 24%, supportiveness 26%, job security 30%, power and authority 39%, increased pay and fringe benefits 47%, sound management practices 48%, recognition and appreciation for good work done 55% and operational autonomy 56%.[174] So, management must consider the following formula:[175]

PERFORMANCE = (ABILITY X MOTIVATION)

2.08 FIELDS AND AREAS OF COST CONTROL AND COST REDUCTION

Cost control and cost reduction are two different plans. Cost control aims at attaining the standard whereas cost reduction aims at improving the standards. That is why it is said that the cost reduction starts where cost control ends. Cost control is concerned

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174. Habibullah, M., "Motivation Mix" Bureau of Economic Research, Dhaka University, 1974 and also quoted in the Management Motivation through result-based-reward system by Habibullah, Ghosh and Quddus, Bangladesh Management Development Centre, Dhaka, 1981, p.4.

175. Vroom, Victor H., "Motivation in Management", America Founda dation for Management Research.

with the operational aspects whereas cost reduction is primarily concerned with the finding better ways and means to produce things at cheaper rates.

The field and areas of cost control and cost reduction is so vast that every part of an organisation is involved in this problem. The areas of cost control and cost reduction can be classified as follows:

(i) On the Basis of Department: An organisation is divided into divisions, branches, departments. Each divisions, branch or department may be an area for cost control and cost reduction, e.g. The procurement, production, store, administration, accounts etc.

(ii) On the Basis of Time: There are periodical costs which are of short-run costs and long-run costs. There can be controlled and reduced in short-run costs and long-run costs.

(iii) On the Basis of Behavior: Costs are fixed and variable. Both these types or one of these can be the subject-matter depending upon the managerial assessment.

(iv) On the Basis of Products: Some products are highly profitable while others may bring about losses. The products incurring losses or less profitable would be the subject-matter.

(v) On the Basis of Price: There are price controls over some products while other products are allowed to be sold at almost unrestricted market prices. In such cases, the area will be for controlled products.

(vi) On the Basis of Elements/Factors: Sometimes certain elements/factors, e.g., material costs or labour costs, prime costs or factory costs etc. may be too high compared with other units in the industry, thus the area would focus its efforts for minimizing one or the other high cost.

Dr. B.K. Basu,[176] an eminent Indian Professor had rightly pointed out six potential areas of leakage and cost-saving in a chart which is presented below:

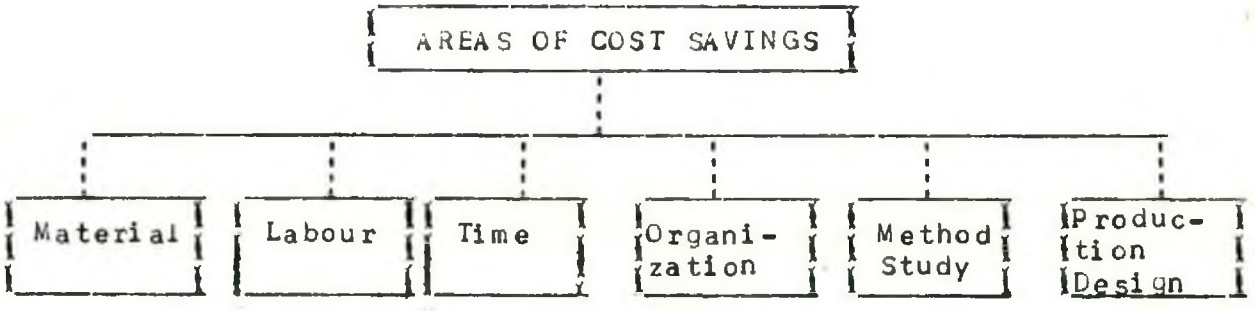

Chart: 2.03

Source: Basu, B.K., Cost Control.

The Institute of Cost and Works Accountants, London, published a book named, "Cost Reduction" in which they described the critical area for cost reduction.[177]

The book also mentioned that in outlining the principal directions in which cost reduction may be achieved it has been deemed advisable to deal with the problem under four broad headings. Such as:

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176. Basu, B.K., "Cost Control", Survey, A Journal of the Indian Institute of Social Welfare and Business Management, Calcutta, May, 1974, p.49.

177. The Institute of Cost and Works Accountants, London, "Cost Reduction" (copy right), 1956, p.9.

i) Design,

ii) Factory organization and methods,

iii) Marketing,

iv) Finance.

The Institute of Cost and Works Accountants, London, starts the area from the design and ends with finance activities, i.e., it covers the whole and every part of an organisation. In this study, the researcher with the institute but considered the area both as cost control and cost reduction. Let us discuss each area briefly.

(i) Design: Product design is the first step in the manufacture of a product and the impact of cost control and cost reduction effected at this stage is felt throughout the manufacturing life of the product. It has the greatest scope with impairing quality of the product. In order to bring improvement, the following areas should be looked into:

(a) Design of production method,

(b) Design of tools, equipments and machinery,

(c) Method standardisation, and

(d) Layout of building, machinery, transport equipment etc.

(ii) Factory Organisation and Methods: Factory organisation and production method also provide wide scope for cost control and cost reduction as there is every possibility of improving, standardising and simplifying production methods and process, adoption of

new manufacturing techniques, new processes, new production methods, new organisation methods, etc. In order to cost control and cost reduction the programme should be followed:

(a) Material Control: Purchasing, receiving, inspection, storage, handling, stock, issue etc.

(b) Labour Control: Recruitment, training, placement, promotion, work study, remunerations, productivity, turnover, overtime etc.

(c) Overhead Control: Classification, distribution, allocation, appointment, absorption etc.

(d) Production planning and control.

(e) Services to production departments.

(f) System analysis and development.

(iii) Marketing: Marketing embraces both selling and distribution functions which also provide an important area of cost control and cost reduction includes:

(a) Market research,

(b) Advertisement,

(c) Sales office,

(d) Warehousing,

(e) Packing,

(f) Distribution,

(g) After-sales service,

(h) Transport etc.

(iv) Finance: Finance is one of the critical and sensitive areas. The main object of cost control and cost reduction in this regard is to achieve maximum return on the capital employed which can be achieved by making optimum utilisation of financial resources. It may be mentioned that from the owner's point of view waste of capital is a greater danger than any other form of waste in industry. The objectives of financial management should cover:

(a) Better utilization of fixed assets;

(b) Better inventory control;

(c) Optimum use of working capital;

(d) Better utilization of productive capacity;

(e) Better return on capital employed, etc.

CHAPTER - III

ECONOMICS OF FERTILIZER AND NEED FOR COST MINIMIZATION

3.01 FERTILIZER- ITS ORIGIN

The literal meaning of the term 'fertilizer' is manure which is the food for plants. Fertilizer has been defined by different writers[1] in different ways but the central theme remains the same. It may be observed from the survey of available definations that the fertilizer is the substance that provides the essential chemical elements, being compounded with the soil, to the plant for its required nutrition and normal growth.

The three essential elements needed by the plants, and plants can not live without these primary nutritional elements, viz., nitrogen, phosphorus and potassium. Of secondary importance are calcium, magnesium and sulpher, and in smaller quantities of baron, chlorine, cobalt, copper, iron, manganese, molybdenum and zinc - called micronutrients or trace elements. Plants obtain all these elements from the soil. They must be added to soils deficient in them because of natural conditions, leaching or intensive crop cultivation.

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1. (a) Lexicon Universal Encyclopedia, Volume 8/F, Lexicon Publications, Inc., New York, 1983, p.61.
   (b) Funk & Wagnalls New Encyclopedia, Volume 9, p.429.
   (c) The Encyclopedia Americana, Volume 11, International edition, Grolier Incorporated International Headquarters, Danbury, USA, 1983, p.132.
   (d) Collier's Encyclopedia, Volume 8, New York, 1956, p.16.
   (e) United Nations, Fertilizer Manual, New York, 1980, p.32.

Different kinds of substance such as, animal excrement, straw, and other plant materials etc. that were mostly as fertilizers used in ancient times contained one or more of the three essential elements mention in the above.

Since Roman times, Marl and other liming materials have been used to supply calcium and simultaneously to reduce the soil's acidity. "The value of animal manure for improving the productivity of land, was recognized perhaps as early as the beginning of agriculture".[2] Plimy the Elder, writing in the 1st Century AD, explored the use of green manures and the value of ashes, which contained potash, a source of potassium. Greco-Roman agricultural writers enumerated the merits of using the dung of birds and poultry and the excreta of horses, cows, goats, sheep and humans for different soils and crops, as well as describing the benefits of compost prepared from dung, vines, straw, stalks, leaves, weeds and other trash. Most of the early fertilizer products, however, were made from agricultural and industrial residues: animal manures, blood and bones from butchered cattle, cotton seed meal, fish scraps, and caster pomace. The Elizabethan philosopher, Sir Francis Bacon, was the first to describe scientific research on Fertilizers made from composts and manures.[3] The 17th century alchemist Johann Glanber discovered a method of preparing saltpeter and commented on its use as a fertilizer, which might be called the first complete mineral fertilizer. The Second John Winthsop (1606-76), a founder of the Connecti cut colonies, established a joint stock company for manufacturing

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2. Lexicon Universal Encyclopedia, Lexion Publications, Inc., New York, 1983, p.61.
3. Ibid., p.61.

saltpeter from the excreta of farm animals, thus becoming the first fertilizer manufacturer in the United States. The foundation for the modern fertilizer industry was laid by Liebig, starting in 1840.[4] In 1842, the English agriculturist Sir John Lawes received a patent for producing a more soluble, and hence more effective, form of phosphate by treating bones with sulfuric acid.[5] His method, with which the first Superphosphate was produced, marked the beginning of the chemical fertilizer industry. Other followed, and by 1853 there were 14 manufacturers in the United Kingdom and several in other countries. By 1870, 80 factories were reported to be operating in the United Kingdom.

Fertilizers may be broadly classified under two categories e.g. natural fertilizers and chemical or synthetic fertilizers. However, in view of the scope of this present research work as already mentioned in chapter I, page-19, the subsequent study will be entirely based on the aspects relating to Chemical Fertilizer as a 'Concentrated plant food'.[6]

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4. United Nations, "Fertilizer Manual", New York, 1980, p.3.

5. Lexicon Universal Encyclopedia, Volume 8/F, Lexicon Publications, Inc., New York, 1983, p.61.

6. Satter, M.A., "Fertilizers : Not too Much, Not too Less", The New Nation (English Daily Newspaper), Dhaka, August 29, 1986.

3.02 FERTILIZER - ITS EFFECT ON AGRICULTURAL OUTPUT AND FOOD SELF-SUFFICIENCY:

Like the First Five-Year Plan, the Two-Year Plan, the Second Five-Year Plan and the Third Five-Year Plan of Bangladesh also emphasized on rural development with food and agriculture as its centre-piece. Although in 1984-85 country produced 16.12 million tons of cereal food but the self-sufficiency in food gains was in fact lacking. In attaining self-sufficiency in food by 1989-90, the Planning Commission in the Third Five Year Plan has set over all production target of 20.7 million tons of cereal food.[7] As a result, the chemical fertilizer has become the pivot of all modern agricultural inputs that are essentially required in attaining the higher production target vis-a-vis self-sufficiency in food production.

Bangladesh must concentrate on yield improvement for increasing food grains production in future. In recent studies[8] it has been observed that the productivity scale in Bangladesh ranks very low compared with other developing countries in Asia and Africa. The Asian Development Bank has conducted case studies on three countries -

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7. Government of the People's Republic of Bangladesh, The Third Five Year Plan: 1985-90, (Dhaka: Planning Commission, 1985), p.165.

8. (a) Alamgir, Mohiuddin, "Some Aspects of Bangladesh Agriculture: Review of Performance and Evaluation of Policies", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol. 3, No. 3, 1975), p.261.

   (b) Hossain, Mahabub, "Food Grain Production in Bangladesh: Performance, Potential and Constraints", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol. viii, no. 1&2, 1980), p.45.

Bangladesh, Malaysia and Korea, that show the relative position of the three countries in respect of rural development experien-ces[9] and the following table (Table-3.01) makes the picture clear:

Table - 3.01

Key Indicators in Bangladesh, Malaysia and Republic of Korea.

Indicator	Year	Bangla-desh	Malay-sia	Republic of Korea
Agriculture as % of GDP	1984	54	22	14
Percentage of workforce in agriculture	1984	74	36	27
Yield of paddy (kg/ha)	1983	2,047	2,867	6,203
Index of per capita food production (Base 1974-76 = 100)	1983	100	112	116

The above table discloses that agriculture as percentage of Gross Domestic Products (GDP) in 1984 of Bangladesh, Malaysia and Republic of Korea were as 54, 22 and 14 respectively. And the position in respect of paddy production is 2,047, 2,867 and 6,203 (ka/ha) of Bangladesh, Malaysia and Republic of Korea respectively. It is also clear that though Bangladesh depends mostly on agricultural sector, its position in paddy production (which is its staple food) is the lowest. A daily news paper of Bangladesh in an editorial stated that agriculture continued to be the major sector in the

9. Asian Development Bank, Rural Development in Asia and Pacific, (Manila: Papers and Proceedings of the Asian Development Bank, Regional Seminar on Rural Development, Vol. I, 15-23 October, 1984), p.78.

economy of Bangladesh it also held the view that some sixty percent of the Gross National Product came from this sector.[10] The Third Five Year Plan of the Government of the People's Republic of Bangladesh statistically shows that though there will be some favourable general change in our GDP structure in 1989-90 from that of 1984-85; but still GDP will be dominated by the agriculture sector i.e. agriculture alone covers 46.9% of the total GDP.[11]

It transpires from the above that 'the food problem is one of the most critical aspects of Bangladesh's struggle to achieve economic development'.[12] The World Bank, in its annual report stated that countries like India, Pakistan and Sri Lanka achieved virtual self-sufficiency in food grains, while Bangladesh had only made a program for achieving self-sufficiency in food by the end of the decade.[13] To accelerate the pace of industrialisation, the government of Bangladesh announced the Industrial Policy-1986 with the objective, among others promote agro-based and agro-supportive industries to increase contribution of industrial sector to GDP and resource augmentation.[14]

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10. The Bangladesh Observer, "Stake in Agriculture", (Dhaka: 7th January, 1987).
11. Government of the People's Republic of Bangladesh, The Third Five Year Plan (Dhaka: Planning Commission, 1985), p.44.
12. Mahmud, Wahiduddin, "Development Strategy and the Problem of Food Supply in Bangladesh", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.viii, No.1&2, 1980, p.71.
13. World Bank, The World Bank Annual Report 1986, (Washington, D.C., 1986), p.99.
14. Government of the People's Republic of Bangladesh, Industrial Policy-1986, (Dhaka: Ministry of Industries, 1986), p.1.

In recent years the introduction of the High Yielding Variety (HYV) seeds and fertilizers, has been accepted as a major policy measure in the agriculture of the developing countries for the primary objective of attaining self-sufficiency in foodgrains.[15] According to Mahabub Hossain, in Bangladesh the long-term (1949-84) trend rate growth in agricultural output is 2.0 per cent per annum against a rate of population growth of about 2.6 per cent.[16] That is why, Mohiuddin Alamgir and L.J. Berlage, clearly states that if Bangladesh is to attain food self-sufficiency at a reasonable price in the near future, rice production must grow at faster rate than that obtained from the present trend.[17] A famous english daily in Dhaka in its editorial, categorically described that food was a priority item and had to be kept above politics.[18]

In the United States, Christensen and Stevens[19] estimated that about 55% of U.S. grain yield increased over the 1940-55 period was due to fertilizer, while the Council for Agricultural Science and Technology (CAST)[20] estimated that about one-third of U.S. grain production was due to fertilizer.

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15. Muqtada, M., "The Seed-Fertilizer Technology and Surplus Labour in Bangladesh Agriculture", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.3, No.4, 1975), p.403.

16. Hossain, Mahabub, "Agricultural Development in Bangladesh: A Historical Perspective". The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.xii, No.4, 1984), p.52.

17. Alamgir, Mohiuddin and Berlage, L.J., "Foodgrain (Rice and Wheat) demand, import and price policy for Bangladesh", (The Bangladesh Economic Review, (Dhaka: Bangladesh Institute of Development Economics, Vol.1, No.1, 1973), p.44.

18. The Bangladesh Observer, "Need and Supply of Food", (Dhaka: November 6, 1986.

19. Christensen, R.W. and Stevens, R., "How United States Improved Its Agriculture", USDA, ERS Foreign Agricultural Economic Report No.76, (Washington, D.C., 1964).

20. Council for Agricultural Science and Technology, The US Fertilizer Situation and Outlook, (Iowa: Iowa State University Press, 1974).

From time to time the United Nations called meetings for discussions and deliberation on the common problems of its member countries in the fertilizer sector. The First Consultation Meeting on the Fertilizer Industry was held on 17-21 January, 1977 in Vienna, the Second Consultation Meeting on the Fertilizer Industry was held on 6-10 November, 1978, in Austria, the Third Consultation Meeting on the Fertilizer Industry was held on 29 September- 2 October 1980 in Brazil and so on. These meetings were attended by International Organizations and member countries representing governments, industry, labour and consumer groups.

The Fertilizer Corporation of India (FCI) was set up in 1961 to serve as a technology base for the country with the objective of achieving self-reliance in all aspects of fertilizer science and technology.[21]

In Bangladesh, fertilizer has become popular in increasing farm output. The use of optimal doses of fertilizer in the high yielding varieties is becoming increasingly crucial in the modern seed-based and irrigation-oriented technology.[22]

It may be concluded that a steady growth in fertilizer consumption is essential to increase agricultural output and to achieve the country's food self-sufficiency.

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21. Ghosh, Sailendranath, "Fertilizer Technology : Fractured Profile of Self-Reliance", Economic and Political Weekly, (Bombay: Vol. xxi, no. 16, April 19, 1986).

22. The New Nation, "Fertilizer and Incentive Prices", (Dhaka: Editorial, 28th April, 1986).

3.03 USES OF FERTILIZER AND ITS CONSUMPTION

Well known academician G.M. Desai is of the opinion that 'the emphasis on increased use of fertilizer is easy to understand.'[23] In the foregoing discussion, the reason for emphasizing the increased use of fertilizer has been made clear and easy to understand. In this connection, P.C. Bansil further states that chemical fertilizer plays an important role in any scheme for boosting up agricultural output.[24] A.K.M. Mosharraf Hossain, Chairman, Bangladesh Chemical Industries Corporation, holds the view that Bangladesh produced 7 million tons of food grains in 1950 without using chemical fertilizer and in 1985 the consumption of fertilizer stood at 1.4 million tons in our country and the agricultural production increased to 16 million tons. Mr. Hossain argued that generally, with the application of one ton of fertilizer, agricultural productivity increased to 5 tons.[25] Bangladesh Agricultural Development Corporation on the basis of its twenty five years of experiences stated that fertilizer being the source of plant food contributed around 50% of the increased production obtained on account of inputs use.[26] Experience in many developed countries as well as field trials

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23. Desai, Gunvant M., Growth of Fertilizer Use in Indian Agriculture : Past Trends and Future Demand, (New York: Cornel University, 1968), p.5.

24. Bansil, P.C., Agricultural Problems of India, (New Delhi: Oxford & IBH Publishing Co., 1981), p.117.

25. Hossain, A.K.M. Mosharraf, "Fertilizer Industry : Blueprint for Tomorrow", The Bangladesh Observer, (Dhaka: 26th February, 1987).

26. Bangladesh Agricultural Development Corporation, Twenty Five Years of BADC : 1961 to 1986, (Dhaka 1986), p.11.

conducted by the Food and Agriculture Organisation (FAO) in the developing countries have shown that the application of one ton of fertilizer can increase the yield of food grains by five to ten tons.[27] Fertilizer, when used in combination with the other inputs such as high-yielding varieties and irrigation water, results in positive interaction thereby increasing further its contribution to yield, which as a result increases.[28] Bangladeshi economist states that the use of fertilizer is mainly dependent on the crops grown and their productivity.[29]

An expert viewed that agricultural production depended on the cultivable area and the productivity per unit of land.[30] Mishra and Morathia argued that fertilizers could be substituted for land such that a given level of paddy output can be produced with less land and more fertilizers.[31] Khan and Heady stated that one ton of fertilizer nutrient replaced 101.55 acres and 33.58 acres of land in production of wheat and paddy respectively.[32]

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27. United Nations, Fertilizer Industry, UNIDO, Monographs on Industrial Development, Industrialization of Developing Countries: Problems and Prospects, Monograph no. 6. Based on the proceedings of the International Symposium on Industrial Development, Athens, November-December, 1967 (New York: 1969), p.1.

28. Food and Agriculture Organization of the United Nations, Crop Production Levels and Fertilizer Use (Rome: 1981), p.3.

29. Quasem, M.A., "Factors Affecting the Use of Fertilizer in Bangladesh", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol. vi, No. 3, 1978), p.338.

30. Kobayashi, Eiji, "Some Measures to Increase Foodgrain Production in India", Mathur (edited), Agricultural Policy and Food Self-Sufficiency, (New Delhi: Associate Publishing House, 1970), p.61.

31. Mishra, B.L., and Marothia, D.K., "Possibilities of Fertilizer Substitution for Land in Paddy Production", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.III, No.2, 1975), p.244.

32. Khan, R.A. & Heady, E.O., "Marginal Rates of Fertilizer Substitution for Land Derived from Experimental Production Function", (Islamabad: USAID, 1972).

It reveals from the studies of the Bangladesh Institute of Development Studies that increase in use of fertilizer in Bangladesh during 1977-78 to 1983-84 is 'primarily a result of four factors'[33] as under:

i) Changes in the crop composition,

ii) Increase in fertilized area,

iii) Increase in number of users, and

iv) Introduction of new crop (Wheat).

Findings of the Centre for Development Science is that fertilizer levels have a direct bearing on rice output in the study areas.[34] Farmers took their fertilizer rate decisions on the basis of expected response.[35]

In conclusion the researcher views with the languages of FAO findings is that if agricultural production is to increase in most countries of the world, for most crops under most conditions, the increased use of fertilizer must accompany the application of other methods of technological and scientific development to farming.[36]

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33. Hossain, Mahabub, and Quasem, M.A., "Growth of Fertilizer Consumption in Two Villages of Bangladesh 1977-84", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol. XIV, No. 1, 1986), p.74.

34. Centre for Development Science, "Fertilizer Price Decontrol Study", (Dhaka: 1984), p.68.

35. Jha, Dayanatha, and Sarim, Rakesh, "An Analysis of Levels, Patterns and Determinants of Fertilizer Use on Farms in Selected Regions of Semi-arid tropical India", (Andhra Pradesh: International Crops Research Institute for the Semi-arid Tropics, 1981), p.48.

36. Food and Agriculture Organization of the United Nations, Crop Production Levels and Fertilizer Use, (Rome, 1962), p.35.

The estimated world fertilizer demand in 2,000 is 264 million tons as compared with 83.6 million tons in 1974 and that of fertilizer use in developing countries is expected to increase from 19.3 million tons in 1974 to 92 million tons in 2,000.[37]

In China, chemical fertilizer consumption in 1952, amounted to 295,000 tons, averaging 0.75 kilogrammes per hectare and the output went upto 12,694,000 tons in 1980, averaging 127.8 kilogrammes per hectate, a 170-fold increase over 1952.[38]

In Bangladesh, the Bureau of Statistics published in its Statistical Yearbook that the chemical fertilizer consumption in 1973-74 amounted to 380 thousand tons which increased to 1257 thousand tons in 1984-85 (Table-3.02).[39]

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37. United Nations Industrial Development Organization, Fertilizer Manual, (Vienna, 1980), pp.11-12.

38. China Hand Book Series : Economy, (Beijing: Foreign Languages Press, 1984), p.218.

39. Government of the People's Republic of Bangladesh, 1986 : Statistical Year Book of Bangladesh, (Dhaka: Bureau of Statistics, Ministry of Planning), p.292.

Table - 3.02

Chemical Fertilizer Consumption by Volume

(Thousand tons)

Items	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
Urea	268	176	312	353	480	471	532	560	519	619	708	832	647
TSP	94	76	111	126	192	178	203	215	208	203	261	346	259
MP	18	18	22	22	41	47	46	85*	45	50	63	69	52
Others (DAP, SP, HP, NPK & Zinc)	-	12	13	11	5	46	53	13	58	82	96	10	-
Total :	380	282	458	512	718	742	834	873	830	954	1128	1257	958
Percentages:													
Urea	71	62	68	69	67	63	64	64	63	65	63	66	68
TSP	25	27	24	25	27	24	24	25	25	21	23	28	27
MP	5	6	5	4	6	6	6	10	5	5	6	5	5
Others (DAP, SP, HP, NPK & Zinc)	-	4	3	2	1	6	6	1	7	9	9	1	-
Total :	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes : TSP - Triple Superphosphate, MP - Muriate of Potash, SP - Single Superphosphate, HP - Hyperphosphate.

* Date for 1980-81 is combined figure for MP and DAP.

Source: 1986 Statistical Year Book of Bangladesh.

Mr. M.A. Samad, has prepared a comprehensive statement (Table-3.03) showing fertilizer production, demand and import requirements for Bangladesh for the period from 1982 to 1990,[40] which can give us a concrete indication of increasing fertilizer production, otherwise we are to spend huge amount of our foreign currency for imports.

Table - 3.03

Fertilizer Production, Demand and Import Requirements
1982-1990
(thousand tonnes)

Year	Production	Domestic Demand	Import Deficit
1982-83	770.0	954	184
1983-84	810.0	1,036	226
1984-85	794.0	1,156	326
1985-86	817.0	1,300	483
1986-87	965.0*	1,462	497
1987-88	986.0*	1,644	658
1988-89	1,324.0*	1,842	518
1989-90	1,435.0*	2,063	628

* Estimates based on plant operation at 80% of installed capacity.

Source: Samad, M.A. (Chief Chemist, FPIRP, Banglades-h Chemical Industries Corporation), "Focus on Fertilizer Production and Consumption in Bangladesh", Fertilizer Focus, June, 1986, FMB Publications Ltd., England, p.28.

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40. Samad, M.A., "Focus on : Fertilizer Production and Consumption in Bangladesh", Fertilizer Focus, (England: FMB Publications Ltd., June 1986), p.28.

3.04 PROCUREMENT OF FERTILIZER AND ITS DISTRIBUTION:

According to an eminent Bangladeshi economist, availability of fertilizer "at the right time, in the right quantity and at the right locations" is considered a crucial factor in expanding agricultural production through increasing use of fertilizer.[41] A daily news paper of Dhaka stated in its editorial that the production of fertilizer had shown an upward trend and the demand for it had also increased over the years. Accordingly farmers in this country have demonstrated their ability to use chemical fertilizer and reap the benefit thereof.[42]

International Fertilizer Development Center (IFDC) emphasised the need of improving the operational efficiency of the overall Bangladesh fertilizer supply system with timely availability to maximize self-sufficiency in the supply of fertilizer by increasing output.[43] United Nations in its development and transfer of technology series argued that the establishment of an effective fertilizer production and marketing system in most developing countries was not likely to succeed unless the government assigned a high priority to it and adopted policies to expedite its development.[44] The United Nations Industrial Development Organization (UNIDO) study suggests that

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41. Quasem, M.A., "Supply and Distribution of Fertilizers in Bangladesh", Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh, (Washington, D.C., 1985), p.303.

42. The Bangladesh Observer, "Fertilizer for Winter Farming", (Dhaka: 22nd October, 1985).

43. International Fertilizer Development Center, Bangladesh Policy Options for the Development of the Fertilizer Sector, (Alabama, 1983).

44. United Nations Industrial Development Organisation, Fertilizer Manual, (Vienna, 1980), p.331.

developing countries should construct sufficient number of fertilizer plants to become atleast self-sufficient as a group in nitrogen and phosphate fertilizers.[45] Experts views on the U.S. Fertilizer Industry as, "a continuous supply of chemical fertilizers is vital to U.S. farmers and consumers, because crop output and food availability depend directly on the use of fertilizer.[46]

The Bangladesh Agricultural Development Corporation (BADC) is responsible for the procurement and distribution of all fertilizers in Bangladesh, both domestic and imported. The East Pakistan Agricultural Development Corporation which started functioning from the 16th October, 1961 was changed into Bangladesh Agricultural Development Corporation in 1971.[47] Prior to 1961, importation and distribution of fertilizer was handled by the Department of Agriculture in the then Government of East Pakistan. Following the recommendation by Food and Agricultural Organisation (FAO), the East Pakistan Agricultural Development Corporation now known as Bangladesh Agricultural Development Corporation (BADC) was created by the govemment in 1961 to take over, inter alia, the commercial function of imporation and distribution of fertilizer from the Department. At present BADC is responsible for importation and distribution of fertilizers procured under various aid, loan and barter arrangements and distribution of locally produced fertilizer from the existing fertilizer

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45. Ibid., p.13.

46. Paul, Duane A., Kilmer, Richard, Altobello, Maridyn, and Harrington, David N., The Changing U.S. Fertilizer Industry, (Washington, D.C., 1977), p.1.

47. Bangladesh Agricultural Development Corporation, Twenty Five Years of BADC : 1961 to 1986, (Dhaka: 1986), p.7.

Table - 3.04

Sources of Supply of Fertilizers
(Thousand tons)

Sources	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86*
A. IMPORT:												
1. Urea	62	71	11	256	343	282	63	254	42	94	171	163
2. TSP	47	219	20	113	103	212	226	147	134	124	408	356
3. MP	-	37	10	37	70	59	42	26	43	60	75	67
4. Others (HP, NPK, DAP, SP, PS, Zinc)	35	-	-	-	-	11	19	37	80	79	14	1
Sub-Total:	144	327	41	406	516	564	350	464	299	357	668	587
B. DOMESTIC SUPPLY:												
1. Urea:												
a) Fenchuganj	59	47	70	75	49	83	110	114	84	66	109	10
b) Ghorasal	23	234	200	152	225	222	242	244	271	195	209	2
c) Ashuganj	-	-	-	-	-	-	-	-	331	379	388	38
2. TSP:												
a) Chittagong	24	39	43	38	59	58	73	66	84	74	60	8
3. Gypsum:												
a) Chittagong	-	-	-	-	-	-	-	-	-	1	-	-
Sub-Total:	106	320	313	265	333	363	425	424	770	715	766	83
C. GRAND TOTAL (A+B):	250	647	354	671	849	927	775	888	1069	1072	1484	670
% Imported	58	51	12	61	61	61	45	52	28	33	47	88
% Domestic Production	42	49	88	39	39	39	55	48	72	67	53	12

Note : * Figures upto February, 1986.

Source: Statistical Yearbook of Bangladesh, 1985, p.294.

fertilizer in Bangladesh which disclosed that imported and domestic production in 1974-75 was 58% and 42% and in 1984-85 was 47% and 53% respectively.[52]

The government is very much concerned over the inefficient operation of the fertilizer factories in the country. The government is interested to see that the function of production and distribution of fertilizer are performed most effectively, so that the farmers get their fertilizer economically and on a timely basis.[53]

The programme for distribution of chemical fertilizers for the terminal year of the third five year plan period (1989-90) is 18.85 lakh tons. This target is consistent with the food production programme. Upto 1987-88 BADC will be able to distribute about 15 lakh tons. This is based on the average annual growth rate of 4.8%. It would be necessary to raise this growth rate to 11.25% for the next 2 years to achieve the target of 18.85 lakh tons by 1990.

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52. Government of the People's Republic of Bangladesh, 1986: Statistical Yearbook of Bangladesh, (Dhaka: Bangladesh Bureau of Statistics), p.294.

53. A high-level meeting was held on 16.4.1988 presided over by President Hussain Muhammad Ershad and attended by Prime Minister-in-Charge of the Ministry of Industries, Finance Minister, Agriculture Minister and concerned secretaries, The New Nation, Dhaka, 21st May, 1988.

3.05 PRICES OF FERTILIZER AND ITS SUBSIDY

An internationally reputed expert opined that the price-making is one of management's most important tasks and the success or failure of an enterprise may depend on the ability of its management to select the right prices for its goods.[54] He also argued that the successful price-maker needed a knowledge of economics, an understanding of markets, a familiarity with distribution techniques, and a grasp of the relevant cost facts. Another expert presented before the New York meetings of the American Marketing Association and told that effective use of costs for setting prices required a clear understanding of the principle of different costs for different purposes.[55] In the above way, Bangladeshi expert viewed that manufacturer or sellers might use pricing as a powerful weapon in their overall marketing strategy to boost the sale.[56]

Price fixation has been considered to be a vexing problem for public enterprises.[57] Various review of researches on public enterprises show that one cannot recommend a simple and universal rule for public sector pricing that will ensure efficiency of the enterprise and lead to an optimum allocation of national resources simultaneously.[58]

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54. Greer, Howard Clark, "Cost Factors in Price-making", The Harvard Business Review, July-August, 1952, p.362.

55. Dean, Joel, "Cost Forecasting Price Policy", The Journal of Marketing, January 1949.

56. Islam, Misbahul, "Pricing Strategy", Management Development, (Dhaka: The Bangladesh Management Development Centre, Vol.10, No.2, 1981), p.98.

57. Kappor, M.C., "Review of Researches on Marketing Management in Public Enterprises", paper presented in the National Seminar of the Institute of Public Enterprise, Hyderabad in March, 1982.

58. Bhalla, G.S., "Theory and Practice in Public Enterprise Pricing - The Indian Experience", paper presented in the National Seminar of the Institute of Public Enterprise, Hyderabad in March, 1982.

S.S. Ramu describing the pricing alternatives for public enterprises said, "There are many pricing alternatives - marginal cost pricing, average cost pricing, electricity pricing, transfer pricing, cost + reasonable margin, discriminatory pricing, landed cost pricing".[59]

Pricing policy of the public sector units have been viewed with concern by the Government of the People's Republic of Bangladesh since its independence which was disclosed in the First Five-Year Plan (1973-78).[60]

Mahbub Hossain, stated that despite the adverse change in price environment a respectable rate of growth of fertilizer consumption is taken by many to argue that the price of fertilizer is still at a level where raising prices would not have an adverse impact on the growth of fertilizer consumption in the country.[61] The World Bank in its "Bangladesh: Food Policy Review", argued that since fertilizer application has a significant impact on yield per acre and the value of the marginal product of fertilizer is much higher than its price, there seems to exist scope for a substantial upward revision in the prices of fertilizers without causing an adverse impact on its attractiveness to farmers.[62]

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59. Ramu, S. Shiva, "Designing a Research Policy for Public Enterprises", paper presented in the National Seminar of the Institute of Public Enterprise, Hyderabad, in March, 1982.

60. Government of the People's Republic of Bangladesh, The First Five Year Plan, (Dhaka: Planning Commission, 1973), p.261.

61. Hossain, Mahabub, "Price Response of Fertilizer Demand in Bangladesh", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.XIII, No.3&4, 1985).

62. World Bank, Bangladesh : Food Policy Review, 1977.

In Bangladesh, prices of fertilizers have been controlled by the state and dealers are paid a fixed commission. Fertilizer prices are negotiated between the Ministry of Agriculture and the Bangladesh Chemical Industries Corporation, although the final prices have, on occasion, been decided at the cabinet level.[63]

A reference annual of India viewed that in India, the government is controlling, statutorily, the selling prices of all fertilizers in order to make them available to the farmers at a uniform and reasonable rate throughout the country. However, in the process of supporting the selling prices of fertilizers, government has been increasing massive amount of subsidy over the years. The amount of subsidy on indigenous fertilizers alone, has been increased from Rs. 275 crore in 1981-82 to Rs. 1,600 crore in 1985-86. With a view to containing the subsidy on fertilizers, government increased the statutory selling prices on 31 January, 1986. Even with this increase, however, the selling prices of fertilizers today, are at the same level as they were five years ago.[64]

Price statistics indicate that the Urea price from local factories has all along been lower than import price but in the case of TSP there is no discernible trend.[65] State Minister for Agriculture Professor Abdus Salam stated in the Jatiya Sangsad of Bangladesh on

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63. Quasem, M.A., "Supply and Distribution of Fertilizers in Bangladesh", Fertilizer Pricing and Foodgrain Production Strategy in Bangladesh, (Washington, D.C., 1985).

64. Government of India, India 1986 : A Reference Annual, (New Delhi: Publication Division, Ministry of Information and Broadcasting), p.446.

65. Quasem, M.A., Barkat, A., and Khan, S.A., Impact of the New System of Distribution of Fertilizer and Irrigation Machines in Bangladesh, (Dhaka: The Bangladesh Institute of Development Studies, 1984), p.1.

25.2.87[66] that the increase in fertilizer price did not have any adverse impact on agricultural production. He also disclosed that the fertilizer price had been raised by 334 per cent on 10 separate occasions since 1975 till date while the use of fertilizer marked an increase by 350 per cent since 1975 to 1984-85, he said during the question hour in the house.

Fertilizer selling prices has been raised on separate occasions since 1st July, 1982 till 1st October, 1985 which was presented in the government's publication (Table-3.05).[67]

Food and Agriculture Organization of the United Nations has presented a table showing fertilizer prices, particularly Urea price paid by farmers of its member countries,[68] an abstract of which is given herewith (Table-3.06).

To promote fertilizer usage at farmers' level for increasing agricultural production, government was providing subsidy by fixing selling prices of fertilizers at a lower rate than the procurement cost.[69] Fertilizer prices is pegged at the present level and if there be any increase in cost of production/import, the excess

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66. The Bangladesh Observer. Dhaka: 26th February, 1987.

67. Government of the People's Republic of Bangladesh, 1986: Statistical Year Book of Bangladesh, (Dhaka: Bureau of Statistics, Ministry of Planning), p.294.

68. Food and Agriculture Organization of the United Nations, 1984 FAO Fertilizer Year Book, (Rome, 1985), pp.129-131.

69. Hossain, Kobbad, [General Manager (Supply), BADC, Dhaka], "Fertilizer Strategies for Rice Production", Proceedings of the Workshop on 'Experiences with Modern Rice Cultivation in Bangladesh' jointly sponsored by the Bangladesh Rice Research Institute and the Department of Agriculture Extension, Government of the People's Republic of Bangladesh, held at the Bangladesh Rice Research Institute (BRRI) on March, 1983.

Table - 3.05

Price of Fertilizers by Type

Types	1st July, 1982		30th June, 1983		7th July, 1984	
	Per ton	Per nutrient ton	Per ton	Per nutrient ton	Per ton	Per nutrient ton
Urea	4028.56	8757.74	4028.56	8757.73	4431.42	9633.52
TSP (Granular)	3810.80	8284.35	3810.80	8284.34	4191.88	9112.78
TSP (Powder)	2994.20	6509.13	2994.20	6509.13	3293.62	7160.04
MP	2994.20	4990.33	2994.20	4990.13	3293.62	5489.37
DAP	4028.56	6294.63	4028.56	6294.63	4431.42	6924.09

Contd....

Table 3.05 continued

Types	1st January, 1985		1st October, 1985	
	Per ton	Per nutrient ton	Per ton	Per nutrient ton
Urea	4741.72	10308.09	5000.00	10869.50
TSP (Granular)	4485.31	9750.67	5000.00	10869.50
TSP (Powder)	3524.17	7661.24	5000.00	10869.50
MP	3524.17	5873.62	4000.00	8694.80
DAP	4741.72	7408.94	5000.00	10869.50

Source: 1986 Statistical Year Book of Bangladesh.

Table - 3.06

Fertilizer Prices Paid by Farmers
(Urea)

Countries	Local Currency	National Currency Per MT				U.S. Dollar Per MT			
		1980-81	1981-82	1982-83	1983-84	1980-81	1981-82	1982-83	1983-84
Bangladesh	Taka	6156	7278	8622	8622	377	363	363	346
India	Rupee	4150	4920	5110	4354	526	551	531	422
Burma	Kyat	-	-	783	783	-	-	98	97
Pakistan	Rupee	4043	4152	4913	5565	408	393	386	413
Japan	Yen	193696	195217	184348	178696	905	836	743	763
Korea, Rep.	Won	292174	465824	530800	521304	481	684	726	672
Philippines	Peso	4826	5679	5598	6000	642	719	656	540
USA	US$	587	563	510	544	587	563	510	544

Source: 1984 FAO Fertilizer Year Book.

should be met through budgetary subsidy. Huge sums are spent every year on fertilizer subsidy. The actual subsidy on fertilizers has been increased from Tk. 85 million in 1968-69 to nearly Tk. 745 million in 1975-76.[70] Before 1973, the fertilizer used to be heavily subsidized - the extent of subsidy was around 65 per cent. In a recent study by S.A. Khan presented a table (Table-3.07) showing fertilizer subsidy and subsidy as percentage of procurement cost. He

Table - 3.07

Input Subsidy on Fertilizer from 1973-74 to 1983-84

Year	Fertilizer Subsidy (Taka in lacs)	Subsidy as Percentage of Procurement Cost (in %)
1973-74	895.50	22
1974-75	2545.40	26
1975-76	6486.40	54
1976-77	5931.90	44
1977-78	9438.50	47
1978-79	12858.97	50
1979-80	13416.45	43
1980-81	11715.79	35
1981-82	10841.36	30
1982-83	8040.85	17
1983-84	8246.47	14

Source: Salahuddin Ahmed Khan, "The Implication of the Withdrawal of Agricultural Input Price Subsidy on Foodgrain Productivity in Bangladesh", The Dhaka University Studies, Part-C, Vol. 8(2), 1987, p.117.

70. Islam, Rizwanul, "Food Grain Procurement, Input Subsidy and the Public Food Distribution System in Bangladesh : An Analysis of the Policy Package", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol. VIII, No. 1&2, 1980), p.114.

also argued that the money volume gradually came down (except 1980-81) alongside the rate of subsidy.[71] The process of gradually reducing the subsidy on fertilizer started at the time of formulation of the 1972-73 development budget.[72]

Food and Agriculture Organization of the United Nations has shown the total amount of fertilizer subsidy for Asia, Africa, Europe and Occeania country-wise,[73] an abstract of which is shown in the Table-3.08.

In fact, during the stage of formulation of the 1976-77 development budget, the questions of whether to reduce subsidy on fertilizer and provide a higher effective support price for food grains, or to increase subsidy on fertilizer and relax price support for foodgrains, turned out to be issues of intense debate among policy makers. Fertilizer subsidy programme — a number of criteria are considered appropriate, such as Social Benefits, Budgetary Burden, Foreign Exchange Savings and Distributional Implications.

There are arguments for and against fertilizer subsidy.

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71. Khan, Salahuddin Ahmed, "The Implication of the Withdrawal of Agricultural Input Price Subsidy on Foodgrain Productivity in Bangladesh", The Dhaka University Studies, Part-C. Vol. 8(2). 1987, p.117.

72. Ahmed, Raisuddin, "Price Support versus Fertilizer Subsidy for Increasing Rice Production in Bangladesh", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol. VI, No. 2, 1978), p.119.

73. Food and Agriculture Organization of the United Nations, 1984 FAO Fertilizer Year Book, (Rome, 1985), p.150.

Fertilizer Subsidies
(Urea)

Countries	Local Currency	National Currency Per MT				U.S. Dollars Per MT			
		1980-81	1981 82	1982-83	1983-84	1980-81	1981-82	1982-83	1983-84
Bangladesh	Taka	830	1117	187	1117	51	56	8	45
Pakistan	Rupee	1678	1409	2170	2804	169	134	171	208
Afghanistan	Afghani	17391	1248	1248	1248	382	25	25	25
Iran	Rial	19565	40856	31013	31189	277	522	371	361
Indonesia	Rupiah	-	58503	70343	108380	-	91	93	109
Nepal	Rupee	-	-	2739	2456	-	-	199	161
Korea, Rep.	Won	-	-	23396	22497	-	-	32	29

Source: 1984 FAO Fertilizer Year Book.

Famous economist A.A. Abdullah viewed that various donors, in particular the World Bank, are laying pressure on the Bangladesh Government to raise fertilizer prices further to eliminate the subsidy to farmers and it is argued that the fertilizer subsidy is causing a heavy drainage on the treasury, and is a comparatively inefficient use of public funds.[74] He also viewed that Food for Works Program, Employment Guarantee Schemes and Efficiently Targetted Food Distribution Systems to provide cheap for the poor, are some of the policies usually recommended and this is very true, if such program can be suitably expanded and run with reasonable efficiency, the fertilizer subsidy would become comparatively irrelevant as far as equity is concerned.[75]

Again, Mr. Abdullah argues in favour of fertilizer subsidy and against the raise of the fertilizer prices and mentioned that there was probably a deeper reason why donors wanted fertilizer prices to be raised.[76] He argued, once farmers were paying world prices, the BADC lost much of its rationale, the fertilizer trade, perhaps even the industry, could be handed over to the private sector and primitive capitalist accumulation could proceed unhampered in this sector as well.

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74. Abdullah, A.A., "The Fertilizer Subsidy - Cost and Returns", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.XIII, No. 3&4, 1985), p.141.

75. Abdullah, A.A., "Distribution Aspects of the Fertilizer Pricing Policy", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.XIV, No.1, 1986), pp.98-99.

76. Abdullah, A.A., "The Fertilizer Subsidy - Cost and Returns", The Bangladesh Development Studies, (Dhaka: The Bangladesh Institute of Development Studies, Vol.XIII, No. 3&4, 1985, p.146.

A group of experts[77] of the Planning Commission of the Government of the People's Republic of Bangladesh expressed that if cost of production of fertilizer factories became high as a result of over-expenditure caused by over-staffing, top heavy administration and inadequate expense control, selling of fertilizer to the farmers at a price below the cost could not be termed subsidy to farmers in the true sense of the term.

An expert of the Fertilizer Economic Group of the FAO, presented a paper at the FAO/FIAC Regional seminar "Fertilizer Pricing Policies for Africa" held at Kenya and argued that with the more widespread use of fertilizers and higher yields (i.e. pushing the response curve up and to the right), resulting in reducing unit costs, it should be possible for governments to reduce fertilizer subsidies.[78]

During the Third Five-Year Plan (1985-90) the amount of subsidy on fertilizer will be reduced to less than one-third of the level of the Second Five Year Plan because of the policy to eliminate it by the middle of the Third Plan Period.[79] A professional Accountant presented his paper on the Second National Conference of the Institute of Chartered Accountants of Bangladesh and argued that the subsidies on account of fertilizer had been reduced to a great

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77. Habibullah, M., Ghosh, S.N., Helaluzzaman, A.K.M., Quddus M.A., and Chowdhury, M.H., A Study of Government Subsidy to Fertilizer, (Dhaka: Planning Commission, 1980), p.12.

78. Conston, J.W., "Focus : Implications of Crop and Fertilizer Price Relationships in Developing Countries", (Nairobi: 1986).

79. Government of the People's Republic of Bangladesh, The Third Five Year Plan : 1985-90, (Dhaka: Planning Commission, 1985), p.174.

extent but subsidies on food account and nationalised sector should also be withdrawn and proper steps should be taken to minimise loss, wastage and inefficiency in the nationalised sector.[80] Accordingly, the government has decided not to give any more subsidy to the Public Sector industrial units and asked them to improve their efficiency and reduce loss through open competition with the private sector.[81]

In fine, it may be concluded with the arguments of a group of experts of the Planning Commission of the Government of the People's Republic of Bangladesh in which they suggested some steps for reducing subsidy to fertilizer and if economies were affected in the mentioned lines, the government might ensure the supply of fertilizer to farmers at the present rates and the amount of cost saved would amount to net savings in respect of subsidy and this resource may be diverted to some other productive fields.[82]

The researcher can conclude the topic of fertilizer pricing and fertilizer subsidies with the languages of famous economists that fertilizer pricing was an issue for recurring debate between the producing corporation and the Planning Commission of Bangladesh with the final decision being taken by the cabinet.[83] At cabinet level

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80. Hoque, M. Muzammel, "Taxation Policy - as a means of Domestic Resource Mobilisation", (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1985).

81. The Bangladesh Observer, Dhaka, 14th January 1987. (This was disclosed by the Deputy Prime Minister-in-charge of the Ministry of Industries, Mr. Moudud Ahmed in Chittagong on 13th January, 1985).

82. Habibullah, M., Ghosh, S.N. Helaluzzaman, A.K.M., Quddus, M.A., and Chowdhury, M.H., A Study of Government Subsidy to Fertilizer, (Dhaka: Planning Commission, 1980), pp.84-85.

83. Sobhan, Rehman, and Ahmed, Muzaffar, Public Enterprise in an Intermediate Regime : A Study in the Political Economy of Bangladesh, (Dhaka: The Bangladesh Institute of Development Studies, 1980), p.479.

and at the time of budget every year beginning 1972-73, the Commission moved the cabinet to abolish fertilizer subsidies arguing that subsidy to be beneficial to the rich farmers, encouraging smuggling of Urea across the border, effect contributed to deficit finance in the government treasury. Resistance to any price increase was led by the Ministry of Agriculture and BADC who feared that higher prices would reduce fertilizer consumption. Attempts to raise fertilizer prices were also resisted by the ruling party in the name of the farmers. The Ministry of Finance supported the reduction of subsidies but at the sametime opposed increases in the fertilizer price. They tended to confuse the issue by seeing higher prices for the public sector as an attempt to conceal the inefficiency of public enterprise.

3.06 ROLE OF THE BANGLADESH CHEMICAL INDUSTRIES CORPORATION IN THE NATIONALISED SECTOR

One Bangladeshi expert, (Financial Adviser, Bangladesh Steel & Engineering Corporation) described that at the creation of Pakistan in 1947 the geographic area now known as Bangladesh was totally underdeveloped in trade, commerce and industry.[84] The need for the creation of the public sector was felt, when huge profits, earned by

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84. Haque, Anwarul, "System of Internal and External Control of public sector industrial enterprises in Bangladesh", Control Systems for Public Enterprises in Developing Countries, (Ljubljana: International Center for Public Enterprises in Developing Countries, 1982), p.169. (Paper presented at an International Workshop held at Ljubljana, Yugoslavia, 9 to 13 July, 1979 convented by the International Center for Public Enterprises in Developing Countries (ICPE) in collaboration with the UN Division of Public Administration and Finance).

the foreigners, were repatriated out of the country. For greater production, and proper distribution of wealth, in addition to the inheritance of the statutory corporations of the Pakistan days, with the nationalization of certain industrial sectors and financial institutions in Bangladesh, the number of public enterprises have tremendously increased after liberation of the country.

Davies and Hughes define that public enterprise is simply subject to a more direct form of government regulation of industry, in that the production process itself is publicly owned.[85] According to B.C. Tandon, the public must have the final word in the control of public enterprises.[86] Former Cabinet Secretary, Government of India, S.S. Khera described that the public sector as a whole constitutes a powerful instrument in the hands of the government, in fostering the social and economic transformation of the nation.[87] N.N. Mallya described that public enterprises pass under different names in different countries and they may be called the public sector, state enterprises, nationalised industries, socialised industries, or wear the garb of some - ism like Statism, Socialism or Collectivism, but basically they mean the same thing. He viewed that by and large they refer to industries owned and controlled by the state, with other ideological considerations attached to them and it is a matter of degree.[88] R.R. Iyer described that in case of public

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85. Davies, J.R., and Hughes, S., Managerial Economics, (Estover: Macdonald and Evans, 1977), p.165.

86. Tandon, B.C., Management of Public Enterprises, (Allahabad: Chaitanya Publishing House, 1978), p.106.

87. Khera, S.S., "Public Sector Management", Management in Government, (New Delhi: Government of India, Ministry of Information and Broadcasting, 1979), p.89.

88. Mallya, N.N., Public Enterprises in India, (New Delhi: National Publishing House, 1971), p.3.

enterprises in India, the government plays the role of an entrepreneur-cum-investor, as well as that of development banker to the public sector and in terms of the Indian Companies Act, the public sector companies fall into the category of "government companies".[89] One member of the Indian Planning Commission stated that the public sector would cease to be a hospital for the sick and the terminally ill only if preventive action was taken at an early stage.[90]

Famous Indian academician Professor Dr. B.K. Basu viewed in his book in the chapter, 'Audit of Public Enterprises' as the object of the public sector undertakings was to bring out an improvement in the overall economy of the nation and to distribute the advantages derived from the undertakings among the people of the country irrespective of any class, caste, creed and religion.[91] That is why D. Amarchand opined that public enterprises could be justified only for two reasons, one was on the basis of ideology and the other on the basis of efficiency.[92]

Since the government has directly or indirectly assumed responsibility for the public enterprises through direct or indirect ownership and/or control, it needs to exercise the prerogatives of ownership. This implies that it will try to protect the public interest

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89. Iyer, Ramaswamy R., "Control Systems for Public Enterprises in India", Control Systems for Public Enterprises in Developing Countries, (Ljubljana: International Center for Public Enterprises in Developing Countries, 1982), p.235.

90. Hussain, Abid, "Public Sector - Need for Reform", The Daily News, (Dhaka: 24th January, 1988).

91. Basu, B.K., An Insight into Auditing, (Calcutta: Book Syndicate Private Limited, 1981), p.28.1.

92. Amarchand, D., "Management Development and Training : Its Role in Public Enterprises Development", Mishra, R.K., and Ravishankar, S. (edited), Management Development and Training in Public Enterprises, (New Delhi: Ajanta Publications, 1983), p.32.

through its role as guardian of the public interest and trustee of public funds.[93] In defining public enterprise in case of Bangladesh they also argued that three aspects needed to be considered i.e. a distinct public entity, ownership and control, and productive entity which meant a productive entity producing marketed goods and services within an explicit or extractable budget covering at least fifty per cent of current cost from current sales and under the decision-making control of the government or its appointed bodies.[94]

M. Ahmed, again viewed that the public sector in Bangladesh was significant, in the industries sector it was encompassed over four hundred units which accounted for nearly 85% of production in large scale manufacturing sector.[95]

As a public sector institution, Bangladesh Chemical Industries Corporation (BCIC) has already established its image as a leading sector-corporation engaged in the task of industrialising the country in chemical and allied sector was established in July, 1976 under the provision of Presidential Order 27 of 1972 (Bangladesh Industrial Enterprises Nationalised Order) through a merger of three former sector corporations, viz.

i) Bangladesh Fertilizer, Chemical and Pharmaceutical Corporation,
ii) Bangladesh Paper and Board Corporation, and
iii) Bangladesh Tanneries Corporation.

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93. Sobhan, Rehman, and Ahmed, Muzaffer, Public Enterprise in an Intermediate Regime : A Study in the Political Economy of Bangladesh, (Dhaka: The Bangladesh Institute of Development Studies, 1980), p.290.
94. Ibid., p.267.
95. Ahmed, Muzaffer, "Development Planning and Public Sector Enterprises in Bangladesh", Management, Business and Economics, (Dhaka: The Institute of Business Administration, University of Dhaka, Vol.1, No.2, 1975), p.4.

The corporation is a fully government owned industrial sector corporation responsible for control, co-ordination and supervision of the enterprises placed under its management and for the establishment and development of new projects.

BCIC starts with 88 (eighty eight) enterprises in July, 1976 and now in 1985-86 manages 22 (twenty two) large and medium size enterprises after systematic dis-investment of small enterprises, return of enterprises to Bangladeshi owners and dis-investment of the erstwhile abandoned units.

BCIC produces a very wide range of products in the Fertilizer, Paper, Chemical, Cement and other allied industries and the value of production expected in 1986-87 is Tk.914.14 crores, an increase of 28% over 1985-86.[96] The enterprises under the corporation produced goods worth Tk.168.86 crores in 1976-77 which went upto Tk.813.05 crores in 1985-86 at prevailing prices (Table-3.09). It may be seen from the table that every successive year, the overall productivity of the corporation registered positive growth.[97]

In 1976-77, BCIC started with a negative equity of Tk.11.4123 crores (of the existing units) against total assets of Tk.321.6296 crores and net assets of Tk.159.3815 crores. With the financial improvement made by BCIC during the last decade, the negative net worth turned to a positive networth of Tk.497.4635 crores. Total assets and net assets have increased to Tk.2622.7871 crores and Tk.1842.5614 crores respectively.[98]

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96. Government of the People's Republic of Bangladesh, Autonomous Bodies Budgets 1986-87, (Dhaka: Ministry of Finance, 1986), p.24.

97. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka: 1986), p.37.

98. Ibid., p.25.

Table - 3.09

Statement showing Production Value of BCIC from 1976-77 to 1985-86

Year	Production Value in Crore Taka at Prevailing Prices	Index	Increase over previous year (in %)
1976-77	168.86	100	-
1977-78	210.03	119	19
1978-79	249.41	148	24
1979-80	311.30	184	25
1980-81	358.09	212	15
1981-82	419.04	248	17
1982-83	535.18	316	28
1983-84	629.04	373	18
1984-85	694.38	411	10
1985-86	813.05	482	17

Source: Bangladesh Chemical Industries Corporation.

During the last 10 years the corporation has earned profit continuously except for 1977-78. During this period, however, some of the enterprises had incurred loss. During this period profitable enterprises earned profit of Tk.345.64 crores and losing enterprises incurred loss of Tk.188.33 crores.[99]

The profit figure would have been much higher if government would approve of the proposed price accomodating actual cost increased on account of gas, electricity, salaries and wages and other input materials. In BCIC prices of 80% product is fixed by the

99. Ibid., p.41.

government. On many occasions government approval on price adjustment proposal was either delayed or even not given. For that reason price adjustment could not be made continuously for many years which has seriously affected profit.

The corporation believes that as a public sector organization BCIC has an over-riding obligation to the nation to help develop linkage industries in the country. The various goods manufactured by the BCIC enterprises directly affect the welfare of the people in general and the wider economic interest of the country. During the last 10 years multi-dimensional innovative measures were carried in a concerted manner for improved productivity in terms of increased output, better quality, lesser down time and finally reduction of cost of production.[100]

BCIC in its annual report of 1985-86 described that as a public sector corporation, Bangladesh Chemical Industries Corporation owned solemn obligation to ensure that the essential products produced by its enterprises reached the consumers at a reasonable price. At the same time, the corporation recognises the fact that the long-run survival and growth of any enterprise significantly depends on the earning of surplus and maintenance of financial solvency. As such, BCIC has been continuously endeavouring to increase its profitability through augmenting the volume of production and sales and reducing the cost of production through various cost saving and improvement measures.[101]

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100. Ibid., p.47.

101. Bangladesh Chemical Industries Corporation, Annual Report 1985-86, (Dhaka), p.14.

The Head Office is primarily, concerned with the setting of objective/targets, approval of budget, monitoring of actual performance with reference to target/objective, rendering expertise assistance. Each enterprise having separate legal entity and has been delegated with required administrative, technical, commercial and financial authority to operate efficiently and dynamically.

The general direction and administration of the affairs and business of the corporation is vested in the Board of Directors who are appointed by the government while the Chairman is the Chief Executive Officer, the members of the Board act as functional directors. In BCIC, Chairman is the supreme head who is assisted by 5 Directors - Director Finance; Director Technical and Engineering; Director Commercial; Director Production and Research; Director Planning and Implementation and one Secretary. Each enterprise has an Enterprise Management Board/Company Board responsible for overall management of the enterprise. Chairman/Director of the Corporation is the Chairman of the Enterprise Management Board/Company Board who also acts as Director-in-Charge for the same enterprise.

3.07 THE POSITION OF FERTILIZER INDUSTRY IN BANGLADESH

Based on the deliberations of a seminar held in New Delhi, 15-19 September, 1980, organised by FAO in collaboration with the Ministry of Agriculture and Rural Reconstruction, Government of India, with the assistance of the Fertilizer Association of India, in conclusion said clearly that the Fertilizer Industry was making, through the Fertilizer Association of India, a significant and objective contribution to agricultural development.[102]

Realising the importance of fertilizer, the United Nations arranged, First United Nations Interregional seminar on the Production of Fertilizer in Kiev, Ukrainian, USSR, from 24 August to 11 September 1965 and the Second Interregional Fertilizer Symposium in co-operation with the Government of USSR and India, held partly in Kiev, USSR from 21 September to 1 October 1971 and partly in New Delhi, India from 2 to 13 October, 1971.

The Second Inter-Regional Fertilizer Symposium emphasized on identifying the problems faced by the fertilizer industry in developing countries and proposing solutions to problems, where 108 technical papers were presented and discussed. UNIDO circulated a questionnaire covering the problems of the fertilizer industry in developing countries, the highest importance among the problems cited was accorded to "High Cost of Production of Fertilizers".[103]

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102. Food and Agriculture Organization of the United Nations, Maximizing Fertilizer Use Efficiency, (Rome: 1983), p.46.

103. United Nations Industrial Development Organisation, Recent Developments in the Fertilizer Industry, (New York: United Nations, 1972), p.93.

The Supreme Head of the Fertilizer Industry in Bangladesh i.e. Chairman, Bangladesh Chemical Industries Corporation (Fertilizer Industry is included in the Bangladesh Chemical Industries Corporation) viewed in the case of Bangladesh that the Fertilizer Industry was making substantial contribution to the national economy in various ways.[104] He however, described that the fertilizer industries' real contribution lied in increasing agricultural productivity which, in term, improved the socio-economic condition of the vast majority of our population, besides improvement the infrastructure, acquisition of new technology and use of natural resources.

Fertilizer represents the single biggest sector of the Bangladesh Chemical Industries Corporation representing about 44% of the total production value and constituting 75% of the total investment in fixed assets (at cost).[105]

The World Bank presented a working paper on Fertilizer Sector in Egypt, which focused a dynamic sectoral planning model to determine the minimum cost pattern of investment, production, transportation and international trade of meeting the demands for fertilizer over the period 1979-87.[106]

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104. Hossain, A.K.M. Mosharraf, "Fertilizer Industry : Blueprint for Tomorrow", The Bangladesh Observer, (Dhaka: 26th February, 1987).

105. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka: 1986), p.38.

106. World Bank, A Planning Study of the Fertilizer Sector in Egypt, (Washington, D.C., 1977), p.82.

Fertilizer production commenced in Bangladesh in December 1961. There is sufficient reserve of natural gas which is used as raw material and on the other hand demand of fertilizer is increasing tremendously. To assist in raising food production, to meet population growth and to expand GDP, efforts were made by the government to expand indigenous fertilizer production by revamping existing fertilizer facilities and installing new facilities in the Second Five Year Plan, a trend that had continued into the current plan (1985-90) of the Government of the People's Republic of Bangladesh.

A staff working paper of the Asian Development Bank prepared a list of fertilizer production of Asian countries from 1966 to 1982 which showed fertilizer production of South Asia in 1966 was 272 thousand MT and increased in 1982 to 5,976 thousand MT (Table-3.10).[107]

Table - 3.10

Statement showing Fertilizer - All Types: Production of 1966-1982 of South Asia

(Thousand MT)

Country	1966	1967	1968	1969	1970	1971	1972	1973	1974
SOUTH ASIA									
Bangladesh	43	50	40	43	80	21	92	130	46
Nepal	-	-	-	-	-	-	-	-	-
Burma	-	-	-	-	15	32	37	37	43
Afghanistan	-	-	-	-	-	-	-	-	19
India	177	610	776	954	1061	1240	1385	1374	1518
Sri Lanka	-	-	-	-	-	-	-	-	-
Pakistan	52	53	53	134	133	221	281	303	326
Total:	272	713	869	1131	1289	1514	1795	1844	1952

Contd...

107. Asian Development Bank, Agriculture in Asia : Statistical Appendices, (Manila: 1985), p.27.

Table 3.10 continued

Country	1975	1976	1977	1978	1979	1980	1981	1982
Bangladesh	153	148	125	164	201	193	222	269
Nepal	-	-	-	-	-	-	-	-
Burma	47	55	53	58	62	60	60	51
Afghanistan	15	26	38	48	48	50	49	50
India	1828	2347	2680	2965	3005	3022	4110	4432
Sri Lanka	-	-	-	-	2	4	43	101
Pakistan	327	324	325	364	449	639	782	1073
Totals	2370	2900	3221	3599	3767	3968	5266	5976

Source: Asian Development Bank.

At present there are 6 (Six) fertilizer factories in Bangladesh, producing Urea, TSP and Ammonium Sulphate. During the year 1985-86 total production of fertlizer were 9,53,039 MT. Fertilizer production in Bangladesh is increasing year to year (Table-3.11).

Table - 3.11

Statement showing Fertilizer Production in Bangladesh for the last ten years (1976-77 to 1985-86)

(Quantity in thousand MT)

Year	Urea	TSP	Ammonium Sulphate	Total
1976-77	286	38	9	333
1977-78	212	41	9	262
1978-79	291	62	5	358
1979-80	361	71	10	442
1980-81	345	72	10	427
1981-82	408	58	12	478
1982-83	509	69	12	590
1983-84	724	81	11	816
1984-85	742	55	10	807
1985-86	842	101	10	953
Total:	4720	648	98	5466

Reference: Appendix-3.01

Fertilizer production in Bangladesh may also be presented by Historigram (Chart 3.01).

The Chittagong Urea Fertilizer Limited (CUFL) with 5,61,000 MT annual capacity will be constructed at a cost of Tk.1,142 crores, the biggest in Asia, will greatly help the country attain self-sufficiency in fertilizer and boost agricultural production.

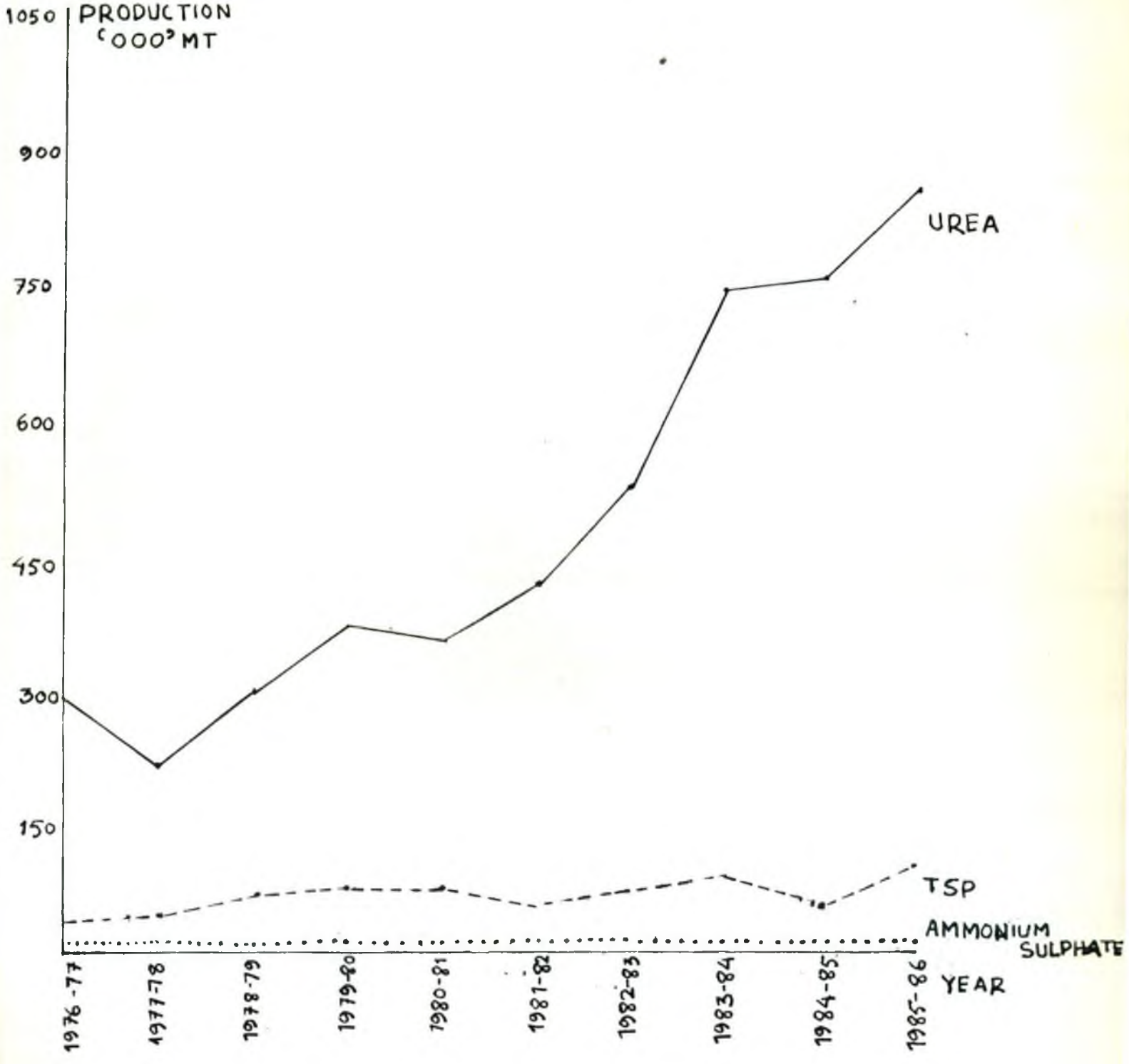

CHART .3.01

His togram representing Fertilyer Production in Bangladesh for the Last ten years (1976-77 to 1985-86).

[Reference: Table-3.11]

Mr. A. Momin, Managing Director, Chittagong Urea Fertilizer Factory Limited, described that with the CUFL urea plant coming on stream in 1988-89 and assuming an average production would have a demand supply balance in 1989-90, again going into deficit from 1990-91.[108]

Bangladesh has bright prospect for exporting urea, particularly in SAARC countries including India, Sri Lanka, Pakistan, Nepal and Bhutan. One important aspect of export during 1980-81 was the export of 40,000 tons Urea (Sri Lanka 20,000 tons and Pakistan 20,000 tons) and ammonium sulphate of 7,293 tons exported to Malaysia and Hongkong.[109] BCIC attained a break-through in the export of Urea during 1982-83. For the first time, BCIC entered in entirely a new market of Urea fertilizer to Indonesia, China, Nepal and Burma.[110] During 1983-84, the corporation was able to export 51,570 tons Urea worth Tk.19.30 crores to Indonesia, China, Nepal and Burma. TSP Complex entered into the list of foreign exchange earning enterprises for the first time by exporting 5,000 MT TSP fertilizer to Nepal in 1983-84.[111]

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108. Momin, Abdul, "CUFP - Another bold Step", The Bangladesh Observer, (Dhaka: December 1, 1985).

109. Bangladesh Chemical Industries Corporation, Annual Report 1980-81, (Dhaka), p.12.

110. Bangladesh Chemical Industries Corporation, Annual Report 1982-83, (Dhaka), p.13.

111. Triple Superphosphate Complex Limited, Annual Report 1983-84, (Chittagong), p.5.

With the implementation of the Jamuna Fertilizer Factory, Karnaphuli Fertilizer Company and other fertilizer plants now at the planning stage, Bangladesh will not only be self-sufficient in Urea Fertilizer, but will also be able to export a significant quantity of Urea. Since Bangladesh has also become a modest exporter of Urea, it is expected that from 1988 Bangladesh will be a major exporter of fertilizer.[112]

A comparative statement showing fertilizer export in quantity and in Taka can give us clear idea of export earning of Bangladesh (Table-3.12).

In the Third Five Year Plan (1985-90), three Urea units could be commissioned adding over 1.5 million tonnes to capacity and perhaps transforming Bangladesh into a net exporter of Urea. M.A. Samad, presented a comprehensive statement showing operational and planned fertilizer production capacity in Bangladesh (Table-3.13).[113]

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112. Hossain, A.K.M. Mosharraf, (Chairman, Bangladesh Chemical Industries Corporation), "Fertilizer Industry : Blueprint for Tomorrow", The Bangladesh Observer, (Dhaka: 26th February, 1987).

113. Samad, M.A., "Focus on Fertilizer Production and Consumption in Bangladesh", Fertilizer Focus, (England, June 1986), p.28.

Table - 3.12

Fertilizer Export Earnings from 1980-81 to 1985-86.

Particulars	1980-81		1981-82		1982-83		1983-84	
	Quantity MT	Taka in lac	Quantity MT	Taka in lac	Quantity MT	Taka in lac	Quantity MT	Taka in lac
A. Urea:								
Natural Gas Fertilizer Factory Ltd.	4,560	198.13	-	-	-	-	-	-
Urea Fertilizer Factory Limited	35,202	1,504.09	-	-	71,890	2613.56	51,570	1930.00
	39,762	1,702.22	-	-	71,890	2613.56	51,570	1930.0
B. TSP:								
Triple Superphosphate Complex Ltd.	-	-	-	-	-	-	5,000	222.05
C. Ammonium Sulphate:								
Natural Gas Fertilizer Factory Ltd.	7,293	124.07	-	-	-	-	-	-
D. Total: (A+B+C)	47,055	1,826.29	-	-	71,890	2613.56	56,570	2152.05

Contd.....

Table 3.12 continued

Particulars	1984-85		1985-86		Total	
	Quantity MT	Taka in lac	Quantity MT	Taka in lac	Quantity MT	Taka in lac
A. Urea:						
Natural Gas Fertilizer Factory Limited	-	-	-	-	4,560	198.13
Urea Fertilizer Factory Limited	26,300	1260.71	20,500	655.67	205,462	7964.03
	26,300	1260.71	20,500	655.67	210,022	8162.16
B. TSP:						
Triple Superphosphate complex Ltd.	-	-	-	-	5,000	222.05
C. Ammonium Sulphate:						
Natural Gas Fertilizer Factory Limited	-	-	-	-	7,293	124.07
D. Total: (A+B+C)	26,300	1260.71	20,500	655.67	222,315	8508.28

Ref: Prepared by the researcher.

Table - 3.13

Operational and Planned Fertilizer Production Capacity

Plants	Name of the Fertilizer Factory	Rated Capacity (thousand tonnes)	Year of Commissioning	Remarks
1	Natural Gas Fertilizer Factory, Fenchuganj, Sylhet:			
	i) Urea	106	1961	
	ii) Ammonium Sulphate	12	1968	
2	Urea Fertilizer Factory Limited, Ghorasal, Narsingdi.	340	1970	
3	Triple Super Phosphate Complex, North Potenga, Chittagong.	152	1974 & 1979	
4.	Zia Fertilizer Company Limited, Ashuganj, Brahmanbaria.	528	1983	
5	Polash Urea Fertilizer Factory, Polash, Narsingdi.	95	1985	
	Total Operational Capacity :	1233		
6	Chittagong Urea Fertilizer Co. Ltd., Chittagong.	561	1988	Under Execution
7	Karnaphuli Fertilizer Co. Ltd., Chittagong.	561	1990	Under Planning
8	Jamuna Urea Fertilizer Limited, Jagannathganj, Jamalpur.	561	1990	Under Planning
	Total Operational and Planned Capacity	2916		

Source: Samad, M.A. (Chief Chemist, FPIRP, Bangladesh Chemical Industries Corporation), "Focus on Fertilizer Production and Consumption in Bangladesh", Fertilizer Focus, FMB Publications Ltd., England, June 1986, p.28.

In India, three decades of planning and development of fertilizer industry has brought to the front line of fertilizer producing countries. India is, today, the fourth largest producer of Nitrogenous fertilizers in the world. Fertilizer, being a key input for agricultural development occupies a prestigious place in country's development strategy. As on 1 October 1986 there were 40 large fertilizer units producing a wide range of straight Nitrogenous, Complex and Phosphatic fertilizers. Besides, there are about 55 small units producing single super phosphate and six units producing Ammonium Sulphate as by-product from steel plants.[114]

In Bangladesh, during the study period, all the fertilizer factories are controlled by the public sector i.e. Bangladesh Chemical Industries Corporation, of which 4 Units producing Urea (including 1 Unit Ammonium Sulphate) and only 1 Unit producing TSP fertilizer.

The daily news paper of Dhaka mentioned on the 11th September 1985 that four proposals for setting up gas-bed fertilizer and amonia plants had been mooted by the private investors. The investment proposals for the related plants have come under suppliers credit or pay as you earn schemes.[115]

Different kinds of fertilizers produced by different fertilizer factories for the last 10 years from 1976-77 to 1985-86 can be presented in Appendix-3.01. Which will disclose that fertilizer production in Bangladesh increased in 1985-86 to 54,66,057 MT against the production of 3,32,788 MT in 1976-77.

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114. Government of India, India 1986 : A Reference Annual, (New Delhi: Ministry of Information and Broadcasting), p.445.

115. The Bangladesh Observer, "Fertilizer Plants in Private Sector Proposed", (Dhaka: 11th September, 1985).

The area of this study is limited only to four fertilizer factories which the researcher mentioned earlier.

Plant no. 1

NATURAL GAS FERTILIZER FACTORY LIMITED

Natural Gas Fertilizer Factory was established at Fenchuganj, Sylhet in the year 1961 at a cost of Tk.23.81 crores by the then EPIDC with a view to boosting up production of food in the country and utilization of natural gas of Haripur, Sylhet for the purpose. It is the first fertilizer factory and first biggest chemical plant in the country with an installed production capacity of 1,06,000 MT Urea, which started its commercial production from July 1962. Another unit named Ammonium Sulphate Plant was established at a cost of Tk.74 lacs and merged with NGFF in September, 1970 with an installed annual acpacity of 12,000 MT. Ammonium Sulphate which was mainly used in tea gardens and tanneries. With the diversion of Ammonia, the main intermediate product for the production of Ammonium Sulphate the installed capacity of Urea production was reduced to 1,00,000 MT annually from 1,06,000 MT. So, the actual installed capacity of NGFF would be annually 1,00,000 MT of Urea and 12,000 MT of Ammonium Sulphate.

In addition to the above, there are other auxiliary processes like Raw Water, Demi Water, Steam, Power, Polythene Plants, Ammonia (Liquid) and Sulphuric Acid in this factory.

Plant no. 2

UREA FERTILIZER FACTORY LIMITED

The Urea Fertilizer Factory was commissioned in 1970 under a Turnkey contract by Toyo Engineering Co. Ltd., Japan with a cost of Tk.33 millions. The factory is located at Ghorasal, Narsingdi, on the bank of the river Sitalakhya and is only 60km. away from the capital city. Construction work started in September, 1967 and was completed in May, 1970 and went into trial production in July 1970. The factory started commercial production from 1st September, 1972. The production capacity is 3,40,000 MT Urea annually. The total factory area is about 245 acres with 44 acres for the factory, 122 acres for the residential estate and the remaining 79 acres accommodates Polash Urea Fertilizer Factory.

Plant no. 3

TRIPLE SUPER PHOSPHATE COMPLEX

Triple Super Phosphate Complex is a Private Limited Company situated at North Potenga, Chittagong on the bank of river Karnaphuli. This is the only TSP fertilizer manufacturing factory in Bangladesh. The complex consists of two units known as TSP-I and TSP-II having installed capacity of 32,000 MT and 1,20,000 MT respectively (Total being 1,52,000 MT). TSP-I unit went into commercial production in April 1977 and TSP-II in September 1974. On 18.8.80 Triple Super Phosphate Complex I and II were converted into a Private Limited Company named as, "TRIPLE SUPER PHOSPHATE COMPLEX LIMITED" under certificate of incorporation no. 8273/112 of 1980-81 with authorised capital of Tk.20,000.00 lacs divided

into 200 lacs shares of Tk.100.00 each and all the assets and liabilities after adjustment of Net Loss incurred upto 17.8.80 were transferred in the name of new company.

The company produces TSP fertilizer by processing Rock Sulphur and Rock Phosphate as raw materials which are imported from Morocco, Jordan, Canada etc.

Sulphuric Acid, Oleum and Phosphoric Acid are its intermediary products while Gypsum comes out as by-product.

An improvement (BMRE/RS) under FIRP at a cost of Tk.39.0400 crores was undertaken in 1980-81. The programme scheduled to be completed in June, 1986 has been extended upto June, 1987 at a revised estimated involvement of Tk.50.8101 crores. With the completion of FIRP programme by June 1987 the Management is expecting to produce 1,50,000 tons TSP in the subsequent years.

Among the improvement programmes TSP Complex successfully installed a granulation plant during 1983-84 at a cost of Tk.9.5000 crores for the production of granular TSP. The enterprise is now producing granular TSP successfully.

Plant no. 4

ZIA FERTILIZER COMPANY LIMITED

Zia Fertilizer Company Limited, the biggest fertilizer plant of the country, having an annual installed capacity of 5,28,000 MT of Urea was transferred to Bangladesh Chemical Industries Corporation on 1.12.83. The factory is located at Ashuganj, Brahmanbaria, on the bank of the river Meghna, 69 miles away from Dhaka. The construction work of the factory started in 1976 and was completed in 1981. The company was initially under the direct control of Ministry of Industries and subsequently from December, 1983, the company was placed under the management of Bangladesh Chemical Industries Corporation. Immediately after taking over BCIC made all out efforts to bring stability in production by exercise of vigilance and efficient management.

In order to raise the operating efficiency of the factory at the optimum level, Zia Fertilizer Factory implemented first major overhaul during 1984-85. At present the factory is operating at 100% stream day capacity. No profit and loss account was prepared in 1982-83 as this was a project in that year. However, a memorandum of profit and loss account revealed that the company incurred a loss of Tk.53 crore in that year.

CHAPTER - IV

ANALYSIS OF COST STRUCTURE OF THE FERTILIZER FACTORIES IN BANGLADESH

4.01 INTRODUCTION

The management efficiency of an enterprise, needless to mention, is reflected prima facie by its earning capacity. Usually, the earning capacity of an enterprise and efficiency of its management is reported by the accountant by making use of the accounting systems as well as by discharging their 'functions in gathering, analysing and interpreting a broad range of economic information'.[1] Besides that accountant who, as an adviser to the chief executive, has also to endeavour in identifying the areas of weakness, if any, in the process and mode of operation and also to suggest remedial measures for its improvement. There is no denying the fact, as mentioned in one of some earlier chapters, that control is must for effective performance of a business. Here the role of an accountant is no less than the role of a manager of a business.[2] The result of 'managerial stewardship'[3] in fact, is disclosed through financial and accounting statement. Thus measuring the result of operation of the business undoubtedly bestowed upon the accountant.[4]

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1. Basu, B.K., Lectures on Management Accountancy, (Calcutta: Chatterjee Publishing Concern, 1979), p.2.
2. Rahman, Mawdudur, "An Empirical Investigation into Management Use of Accounting Information and the Influence of Selected Job Related Traits and Organizational Correlates", Unpublished Ph.D. Thesis, Manchester Business School, April 1976, p.232.
3. Basu, B.K., Lectures on Management Accountanty, (Calcutta: Chatterjee Publishing Concern, 1979), p.94.
4. Nag, Amal Bhushan, "Quantifiability and Objectivity in Accounting", Hishab Bijnan, (Annual Journal, Department of Accounting, 1979-80, University of Chittagong), p.2.

After the nationalisation of the enterprises, the performance of the public enterprises are evaluated by the Ministry of Industries, Ministry of Finance and Executive Committee of the National Economic Council and the Accounts are also subject to commercial audit department of the government. Further, the management is answerable to the Public Accounts Committee for any lapses and shortcomings. As such there should be an adequate analysis and identification of such shortcomings with proper justification to satisfy the Public Accounts Committee and other government agencies.

The BCIC Head Office is primarily concerned with setting the targets, approval of budgets, monitoring of actual performance with reference to target, rendering expertise assistance. For the effective and dynamic operation, what is more important 'is proper delegation with responsibility. It is interesting to note that BCIC has realised the importance of delegation in different acres like administrative, technical, commercial and financial'.[5] To keep an eye on the performance of the enterprise, there is an Enterprise Board[a] in each enterprise and one of the Directors of BCIC is the Chairman of the enterprise Board.

Without proper promotion of cost consciousness in all levels of management the idea or better to say, attempt to strengthen financial management will be ended in smoke.[6] It is to be noted again that it has been realised by the BCIC that higher profitability is being attained through improving operating efficiency and cost control.[7]

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5. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka), p.14.
6. Bangladesh Chemical Industries Corporation, "Annual Report 1980-81" (Dhaka), p.15.
7. Bangladesh Chemical Industries Corporation, "Annual Report, 1981-82", (Dhaka), p.9.

a. See Appendix: 4.01

On the other hand, though the BCIC sought for 'a host of other technical innovative measures to minimise wastage with the object of controlling the cost of production'.[8] It is not clearly indicated in the report what they mean by the term host of technical measures. Value Analysis, Automation, etc. may be considered as host of measures for controlling and reducing cost.

Along with improved capacity utilization, enhanced level of production, the corporation has consistently attached all out importance to strengthen its financial management.[b] For the smooth performance of the operation what is more important is to have a note whether set target is achieved as per set planning, budgeting, etc. For this 'Vigilance'[9] is to be maintained to realise the objective. Efforts have been made to bring about by the Corporation to improve productivity of most of the enterprises under its control in terms of 'increased output, better quality, lesser downtime and reduction of cost of production'.[10]

In order to introduce proper financial discipline, it is essential to introduce budgetary control and standard costing system which aids financial management. Management accounting, budgetary control, store accounting system including computerisation for control of inventories, etc. have been introduced by the BCIC.

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8. Ibid., p.12.
9. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", (Dhaka), p.12.
10. Bangladesh Chemical Industries Corporation, "Annual Report 1985-86", (Dhaka), p.19.

b. See Chapter VI of this thesis.

Conferences and Seminars of Heads of Accounts of Enterprises held in 1977, 1979, 1981, 1983 and 1985 were arranged by the Head Office in Dhaka for thorough discussions and taking decisions on various issues, coming up before the enterprise Accounts Heads while discharging their duties.

Many constraints that stand on the way to achieve higher profitability and productivity through reduction of cost and its control have been nicely portrayed by the BCIC which runs as under: "Despite numerous constraints and problems encountered specially in the form of soaring prices of inputs, high incidence of power failure, delay in the approval of price adjustment, foreign exchange constraints, indiscriminate import etc."[11] "The cases of tax anomally in respect of custom duty, sale tax, excise duty, etc. on packing materials like hessian bags and polythene pellets/bags were brought to the notice of government for necessary rectification".[12]

Some of the academician of the country strongly felt that in today's condition of high cost coupled with poor productivity in Bangladesh, resource acquisitions and development, resource maintenance and utilisation was the number one crucial problem of nationalised enterprises.[13] These problems are overall problems of the managers, the corporation executives, the concerned government administration, the Minister and ultimately of the government as a whole.[14] In their view, the situation may be termed as one of

11. Bangladesh Chemical Industries Corporation, "Annual Report 1980-81", (Dhaka), p.11.

12. Triple Superphosphate Complex Limited, "Annual Report 1983-84", (Chittagong), p.12.

13. Habibullah, M., "Manpower Accounting", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1975), p.11.

14. Chowdhury, G.S., "Managerial Problems of Nationalised Industries in Bangladesh", Management Development, (Dhaka: Bangladesh Management Development Centre, 1977), p.15.

poor costing and lack of reliable cost statistics for the industry as a whole.[15]

Organisational dimension is one fundamental aspect of cost accounting which helps management in introducing an effective cost control and cost reduction system. Cost centre, responsibility centre and organisation structure are the three import elements of organisational dimension. It is worth emphasizing that cost control and cost reduction cannot be achieved just by the accumulation of data and reporting the same through organisation's segments. A proper organisational structure is, therefore, very important for effective cost control and cost reduction system. Therefore, management's first task is to instituting cost effectiveness is to examine the plan of organisation. By a proper organisational structure is meant not the neatly drawn boxes but the proper division of authority and responsibility in the organisation. In this way, management can delegate the responsibility for controlling costs to various individuals in the organisation. For example, to achieve control over rising costs of materials and inventory, BCIC established MPIC department under which material management functions of purchasing, production planning, inventory control etc. is delegated.

Furthermore, a well designed plan of control covering the administrative activities of the business must be instituted. The properly setting cost centre and responsibility centre and clearly drawn organisation structure work as guide post for effective implementation of cost control and cost reduction techniques.

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15. Habibullah, M., "Accounting as a Tool of Solving Business Problems in a Developing Economy", The Dhaka University Studies, Part-A, (Dhaka: 1972), p.21.

The study also emphasises the role of organisational structure and the importance of responsibility and cost centres for the effective implementation of cost control and cost reduction techniques. Thus "Responsibility Accounting" as observed by Professor Dr. B. K. Basu, "is one of the management control system whereby result of operating performance are subject to control and the essence lies in the fact that after identification of the responsibility, cost must be accounted as per specified area".[16]

Costs must be controlled at the point at which they are incurred. For this purpose the entire organisation is divided into various segments known as responsibility centres. A responsibility centre may be include one or more cost centres or a department of a process. Costs are charged to and reported by responsibility centres responsible for incurring them. The performance of each responsible individual is measured against budget or standard and reported to that individual as well as to his supervisor. Thus an accounting system is personalised by looking at cost and revenue from a standpoint of personal control rather than from an institutional standpoint.[17]

In cost accounting, costs are accumulated not only by the nature of expense (material, salaries, rent, electricity etc.) but also by organisation segments, activities, processes, jobs, products, etc. which for the purposes of cost accumulation are called cost centres. Thus a cost centre is an accounting entity for the accumulation, allocation and absorption of costs.[18]

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16. Basu, B.K., "Cost Control", Survey, A Journal of the Indian Institute of Social Welfare and Business Management, Calcutta, May 1974, p.53.
17. Khanna, B.S., and Bansal, S.K., "Motivation Through Responsibility Accounting", The Management Accountant, May 1985, p.233.
18. Pravin, P. Shah, Cost Control and Information Systems, McGraw-Hill Book Company, New York, 1981, p.203.

4.02 ACCOUNTING PATTERNS OF BCIC AND ITS ENTERPRISES

One researcher has regreted that Bangladesh is still following the patterns and fashions of the late thirties in respect of financial reporting and disclosure which fail to meet the information of the various interest groups.[19]

A survey team has viewed that the form of presentation of public enterprise balance sheet in Bangladesh varies considerably, some have good, well presented balance sheets in conformity to modern practice.[20] They also viewed that the Bangladesh Chemical Industries Corporation produces an attractively designed, informative annual report. The report gives us the clear idea that there are in fact three Balance Sheets, described as follows:

i) Bangladesh Chemical Industries Corporation Balance Sheet.

ii) Consolidated Balance Sheet of the Enterprises.

iii) Balance Sheet of Development Projects.

However, a study of the accounts by a group of experts reveals a problem is that there is no explanation of the relationship between the three balance sheets, nor a single consolidated balance sheet for the corporation as a whole.[21]

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19. Ahmed, Mahbub, Evaluation of Financial Statement as a Communication Device in Bangladesh, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1982), p.2.

20. Parry, Michael, and Khan, Ferdous, A Survey of Published Accounts in Bangladesh, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1984), p.117.

21. Ibid., p.118.

Eminent Professor, Laxmi Narain, has presents the results of an intensive study of the annual reports of public enterprises include forty-five government companies and nearly a dozen Public Corporations, together with a departmental enterprise in India and has argued that a well-drafted annual report served as an important medium of communication between the enterprise and the public.[22]

Public sector units submit their costing and private sector units shun such scrutiny, nationalised sector is required to keep facts ready: one can get information almost on demand. So they are targets of controversy. But private sector units refuse all information.[23]

In this connection, it is to mention that 'question of preparation of Balance Sheet arises only when going concern concept is in operation.[24] So, presentation of Balance Sheet of Fertilizer Factories should naturally be based on going concern concept. But the question that arises in this relation is whether presentation of accounts of fertilizer factories should bear the stress proprietory approach or entity approach of equity. Like corporate practices the Balance Sheet of Fertilizer Factories is presented as per law and convention of the land. In this connection the researcher

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22. Narain, Laxmi, Public Enterprise in India. (New Delhi: S. Chand & Co. Ltd., 1975), p.54.

23. Ahmed, Muzaffer, "The Prospect and Problems of Nationalised Industries : A Critical Review of Views", Management, Business and Economics, (Dhaka: The Institute of Business Administration, University of Dhaka, 1975), p.41.

24. Halder, P.K., "Analysis for Harmonizing between Two Extreme View of a Sheet of Balances and going Concern Concept of Balance Sheet", Unpublished Ph.D. Thesis, Calcutta University, 1987, p.4.3.

refers the observation of Dr. Halder that 'corporate accounts are prepared in term of law and convention having bias to proprietory concept'.[25] But truely speaking that proprietory element is absent in case of ownership of fertilizer factories as these are wholly owned by Government of Bangladesh. But in Bangladesh, present practice in fact, thus obstructing the transition of accounting practices from those based on proprietory approach to those based on entity approach. Therefore, it has been rightly observed by Dr. Halder, 'Harmonization is possible if format prescribed by the Companies Act 1913 is suitably changed in order to make the presentation to the tune of entity approach'.[26]

All the enterprises of BCIC are to prepare Profit & Loss Statement and Balance Sheet as per proforma supplied by the Head Office. Thinks seems to have started changing and the style of Profit & Loss Statement is changing with the passing of years.

i) Upto 1980-81: Profit & Loss Statement were prepared on the basis of Income & Expenditure giving figures on individual account.

ii) From the Year 1981-82 to 1984-85: Profit & Loss Statement were prepared on the basis of expenditures to give the total cost are classified as:

(a) Variable Cost,

(b) Fixed Cost.

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25. Ibid. Appendix-I, p.iv.

26. Ibid., pp. 4.2-4.13.

(iii) From the Year 1985-86 and Above: Started a new style giving details of -

a) Gross Profit,

b) Operating Profit, and

c) Net Profit.

In the Profit & Loss Statement a supplementary statement is prepared called cost of goods sold statement showing:

1) Material cost,

2) Conversion cost,

3) Total manufacturing cost,

4) Cost of goods manufactured, and

5) Cost of goods sold.

There are improvements over the traditional system. This perhaps indicates progressive attitude of management of BCIC.

Under the Form F of the Companies Act, one year's figure are required but at the moment previous years figures are furnished along with those of the current year for the purpose of comparison.

In order to bring the uniformity and to maintain accounts in a systematic manner, standard accounting systems with similar type of codification, formats etc. were introduced in different enterprises.[27] For preparing Profit & Loss Statement and Balance Sheet for the Enterprises controlled by the BCIC, the BCIC Head Office circulated uniform code of Accounts in 1981-82 and lastly on the basis of the Monitoring Cell of Ministry of Industries, circulated on 7.9.87 vide Meme No. BCIC/Accounts./Projects-812.

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27. Bangladesh Chemical Industries Corporation, "Ten Years of BCIC", (Dhaka), p.21.

As reported in the annual report that in addition to external and commercial audit, the corporation has its own Internal Audit Division to see that the financial rules and regulations are properly followed.[28] One researcher has categorically described that in Bangladesh public enterprises are subject to three kinds of audit viz., internal audit by the corporation audit department, statutory audit by the chartered accountants and government audit by the director of commercial audit under the Comptroller and Auditor General.[29] Accounting expert believed that audit helps attain cost-affectiveness in operation.[30] As explained later on, internal audit staff played this kind of role though to a limited extent might be characterized as both a "Trouble Shooter", and a "Fire Fighter".[31]

As part of its public accountability, the corporation and enterprises are answerable to "Standing Committee on Public Accounts" and "Parliament Committee on Public Undertakings" comprising of the members of the Parliament.[32] One researcher finds that circumstances might well account for poor parliamentary control and public accountability of Public Industrial Enterprises in Bangladesh.[33] In his

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28. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", (Dhaka), p.12.
29. Mahmud, Monjur Morshed, "Accountability of Public Industrial Enterprises in Bangladesh", Unpublished Ph.D. Thesis, University of Chittagong, Chittagong, 1984, p.441.
30. Paul, Manoj Kumar, "Audit-Value for Money?", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1985), p.32.
31. Gilbert, R. Neal, "Operational Auditing Checks Effectiveness", Turban, Efraim(ed.), Cost Containment in Hospitals, (London: Aspen Systems Corporation, 1980), p.367.
32. Bangladesh Chemical Industries Corporation, Hand Book of Rules and Regulations, Dhaka, 1982, p.2.
33. Mahmud, Monjur Morshed, "Accountability of Public Industrial Enterprises in Bangladesh", unpublished Ph.D. Thesis, University of Chittagong, Chittagong, 1984, p.446.

findings he showed that in the absence of clear-cut objectives, adequate autonomy and inefficient use of accountability instruments and inappropriate performance evaluation system it became difficult to ensure the proper accountability of public enterprises.[34]

The main thrust of the study is to analyse the existing cost systems in the fertilizer industry in Bangladesh, focussing on the variances between goals and actual performance.

4.03 BUDGETARY CONTROL AND STANDARD COSTING

The researcher feels that to boost up organizational efficiency of Bangladesh through controlling cost in all spheres of organisational activities a well-designed plan is a must which can be achieved through introduction of Budgetary Control System. Brown and Howard defined budgetary control as "a system of controlling costs which includes the preparation of budgets, co-ordinating the depattments and establishing responsibilities, comparing actual performance with that budgeted and acting upon results to achieve maximum profitability".[35]

It seems that people of the Accounting Department of BCIC are not happy and it is suggested that while reviewing the budget, adequate analysis should be made to identify the reasons for any unusual variance to make the budget a realistic one.[a]

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34. Ibid., p.433.

35. Brown, J.L., and Howard, L.R., Managerial Accounting and Finance, (Estovers Macdonald & Evans Ltd., 1984), p.251.

a. The Chief Cost Accountant, BCIC suggested in a meeting of Head of Accounts of BCIC Enterprises held on 22nd and 23rd September, 1985 in Dhaka.

As per annual report of BCIC, each enterprise now has up-do-date accounts. Effective use is now made of budget as an instrument of management control. More emphasis is now attached to the regular evaluation of actual expenditure both revenue and capital expenditures under various heads.

The primary tools for control of both manufacturing and non-manufacturing costs are the introduction of Bangladesh Control and Standard Costing System. Cost variances are measured through the application of Standard Costing and Budgetary Control techniques. This study will analyse the factors leading to such variances and recommend measures to control and reduce cost, and thereby improve the cost system.

The literal meaning of 'Variance' is the difference between two figures. The difference may be between actual and standard or between actual and budget. Lipsky states that a cost variance is basically the difference between two amounts; one is a basic, standard reference amount and the other is the amount being compared with that standard.[37]

Variances derived from the comparison may be investigated and explanations for the causes obtained. According to the National Association of Cost Accountants of USA, variances constitute a connecting link between standard costs and actual costs.[38] They

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36. Bangladesh Chemical Industries Corporation, "Annual Report 1985-86", (Dhaka), p.13.

37. Lipsky, D., "Dimensional Principle in the Analysis of Variance", NAA Bulletin, 1960, p.5 as cited by Lal C. Jagetia in "Decision Theory in Investigation of Cost Variance", The Management Accountant, March, 1976, p.196.

38. National Association of Cost Accountants", The Analysis of Manufacturing Cost Variance", Research Series No.22, NACA Bulletin, August, 1952, USA, p.546.

also argued that there were certain advantages to be gained from the adoption of standard costs. Standard costing provides enhanced cost control and permits products at varying times to carry one uniform price. Standard costing can also integrated with budgetary control where the standards set are based upon the same expectations as are used in the compilation of the budget. By integrating standard costing and budgetary control, a formalized series of variances from the standard can be extracted from the accounting records.

Interfirm Comparison (IFC) enables management to solve many problems of a concern by indicating the efficiency of production and selling, adequacy of profits, weak spot in the organisation, etc. It may be mentioned that establishment of budgetary control and standard costing helps management to control cost within an organisation but it does not go too far. Interfirm comparison enables the management to compare its performance or the standard with other similar competitives firms to improve its productivity and profitability gathered from efficient member units.[39] Interfirm comparisons provide those taking part with a yardstick with which to assess their own values, quantities and ratios against the averages for other firms, and so help them to pinpoint their mistakes and sources of losses and thus it can control and reduce cost. Various empirical research works have been done on the industrial efficiency in Bangladesh focusing the significance of the 'Interfirm comparison' technique in performance evaluation.[40]

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39. Basu, B.K., Lectures on Management Accountancy, (Calcutta: Chatterjee Publishing Concern, 1979), p.663.

40. Habibullah, M., Industrial Efficiency and Profitability in Bangladesh, Bureau of Economic Research, University of Dhaka, 1974, pp.4-5.

Break even analysis will also provide those factories with very useful information regarding capacity utilisation, cost recovery and prices of products. The term break-even indicates at what level cost and revenue are in equilibrium, and the term Cost-Volume-Profit analysis explores the relationship existing among cost, revenue, activity levels and the resulting profits. The technique of break-even analysis in cost control has gained in importance in recent years. This method of analysis provides management with cost and profit data for profit planning, policy formulation and decision making.

Break-Even-Analysis is an indicator of idle capacity of a factory. In Bangladesh most of the natinalised fertilizer factories are now operating below the break-even point. The break-even point is not a fixed point, since it will vary with management decisions, product price changes and operating efficiency.

A. PROCEDURE OF BUDGETING:

Discussion with the BCIC executives and it is viewed that budgets are fixed firstly on the basis of increasing production flow and hence as preservation device. But revised budgets are finalised on the basis of practicability. So, for this comparative study, we considered the revised budgets only.

The management of BCIC has decided in preparation of the Annual Budget and fixation of production target of the enterprises under BCIC (vide Memo no. BCIC/CORD/300.05/947 dt. 1.1.1987) that the following guidelines shall henceforth be followed, "The proposed

Annual Budget of the enterprise shall initially be submitted to the Cost & Budget Division, Head Office. After the same is provisionally finalised by the Cost & Budget Division, the budget will be placed in the Enterprise Board Meeting wherein the concerned personnel of the Cost & Budget Division of Head Office shall also remain present, for examination and finalisation of the same before it is placed for approval of the BCIC Board of Directors".

B. BUDGET ANALYSIS:

As a sample, let us have a look into the Budget Analysis of the Natural Gas Fertilizer Factory Limited, Sylhet by their auditors for the two different years of 1983-84 and 1985-86. (M/S. Howlader Yunus & Co., Chartered Accountants, Dhaka, audited the accounts for both the year of 1983-84 and 1985-86 and analysed the budget).

For 1983-84 : Appendix - 4.02

For 1985-86 : Appendix - 4.03

Auditor viewed in the budget analysis that though production unit have exceeded the budget estimates but the expenses have exceeded the flexible budget in maximum head of expenditure of both variable and fixed costs. They also suggested that the management should have been more alert in controlling the expenses through budget.

4.03.1 PRODUCTION

Professional economists, business leaders, policy makers as well as development agencies appeared to be concerned in those days over the alleged inefficiency at which industrial units in Bangladesh was operated and the poor level of profit that the firms showed for the investment made in them.[41] In the pre-liberation days, jute industry in Bangladesh had a low productivity level as compared to that of the jute mills in India, inspite of Bangladesh having superior quality raw material in the close proximity of the jute mills and up-to-date plant and machinery.[42] Researchers have emphasised that Result-Based Reward System (RBRS), forwards an approach is needed to develop new products and add new features to old product, devise ways and means to reduce costs and improve quality as well as explore new customers and develop new markets.[43]

One management consultant has reported that it is the primary obligation of the production department of an enterprise to produce goods of acceptable quality at economic costs.[44] Famous academician argued that production control was the factory's nervous system and the real objective was to get out the desired products economically

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41. Habibullah, M., Industrial Efficiency and Profitability in Bangladesh, (University of Dhaka: Bureau of Economic Research, 1974), p.102.
42. Habibullah, M., "Problems of Productivity in the Jute Industry of Pakistan", The Dhaka University Studies, Part-A, (Dhaka: 1969), p.19.
43. Habibullah, M., Ghosh, S.N. and Quddus, Management Motivation through Result-Based-Review System, (Dhaka: UNDP-ILO, National Management Development Programme, Bangladesh Management Development Centre, 1981), p.55.
44. Islam, M.N., "Quality Control - A Production Tool", Management Development, (Dhaka: Bangladesh Management Development Centre, 1972), p.33.

and on time.[45] Another management consultant viewed that for any industrial organisation to be successful, there must be proper and full control on the production rates and the quality of the manufactured goods.[46] The organisation of a factory or workshop has for its aim efficient production -- this efficiency being measured by the number of articles produced, the quality and price of the production, and the quickness of delivery, the requirements for successful competition are that production must be expeditious, correct and at a minimum cost.[47] On the other hand, it can be stated that production control aims at to achieve the efficiency in production through manufacture of required quantity and quality of product at the lowest cost. This indicates production control is the control of materials, labour, machine utilization, tooling and operation etc.

In India, nominal production of 16,000 tonnes of Nitrogen and 11,000 tonnes of P_2O_5 in 1951-52, fertilizer production increased to 43.28 lakh tonnes of Nitrogen and 14.28 lakh tonnes of P_2O_5 in 1985-86. During 1986-87, the production is expected to rise further to a level of 51.75 lakh tonnes of Nitrogen and 17.75 lakh tonnes of P_2O_5.[48]

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45. Moore, Franklin, G., Production Control, (New York: McGraw-Hill Book Company, 1959), p.6.

46. Khan, Alimullah, "Project Management in Bangladesh", Management Development, (Dhaka: Bangladesh Management Development Centre, 1978), p.73.

47. Owler, L.W.J., and Brown, J.L., Wheldon's Cost Accounting, (London: MacDonald & Evans Ltd., 1984), p.16.

48. Government of India, India 1986 : A Reference Annual, (New Delhi: Publication Division, Ministry of Information and Broadcasting), p.445.

In China, the output of chemical fertilizer in 1980 reached 12.32 million tons. The 1980 output was 2,000 times as much as in 1949, when China produced only 6,000 tons of chemical fertilizer.[49]

The fertilizer industry of Bangladesh has only three products, sales of each of which is not problem because of supply of which is still below the required demand. The first task of the factories are to produce more and more and to attain installed capacity. In this case we shall try to compare the production target and actual production. During the last ten years (1976-77 to 1985-86), Bangladesh produced different kinds of fertilizer were 44,89,183 MT; 6,47,830 MT and 98,364 MT of Urea, TSP and Ammonium Sulphate respectively against the production target of 43,90,000 MT; 7,20,000 MT and 87,500 MT which means 102.26%, 89.98% and 112.42% of target achieved (Table-4.01). During the same period total fertilizer produced in Bangladesh were 52,35,377 MT against the target of 51,97,500 MT which is 100.73% of target achieved. Production and production target of fertilizers for the last ten years can also be represented by Bar-diagram (Chart 4.01).

The Third Five Year Plan of the Government of the People's Republic of Bangladesh stated Benchmark and Production Target for selected manufactured products among which the figure for fertilizer[50] which is shown below:

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49. China Hand Book Series : Economy, Foreign Languages Press, Beijing, 1984, p.161.

50. Government of the People's Republic of Bangladesh, The Third Five Year Plan, (Dhaka: Planning Commission, 1985), p.248.

Benchmark and Production Target

Products	Units	Production 1984-85			Target 1989-90		
		Public Sector	Private Sector	Total	Public Sector	Private Sector	Total
Fertilizer	'000' MT	806	-	806	1,700	450	2,150

Degree of target achieved has a relation on cost of production as has been shown later on.

Table - 4.01

Statement showing Target and Actual Production with Capacity Utilization of Fertilizer in Bangladesh for the last ten years (1976-77 to 1985-86).

Particulars	Production Target MT	Actual Production MT	% of Target Achieved	% of Capacity Utilized
A. Urea:				
NGFF	7,82,000	8,40,653	107.50	81.97
UFFL	23,88,000	24,29,634	101.74	71.46
ZFCL	12,20,000	12,18,896	99.91	76.95
	43,90,000	44,89,183	102.26	75.02
B. TSP:				
TSPC	7,20,000	6,47,830	89.98	42.62
C. Ammonium Sulphate:				
NGFF	87,500	98,364	112.42	81.97
Total (A+B+C) :	51,97,500	52,35,377	100.73	68.67

Notes: NGFF = Natural Gas Fertilizer Factory Limited
UFFL = Urea Fertilizer Factory Limited
ZFCL = Zia Fertilizer Company Limited
TSPC = Triple Superphosphate Complex Limited

(Ref: Prepared by the Researcher through Budget & Annual Reports)

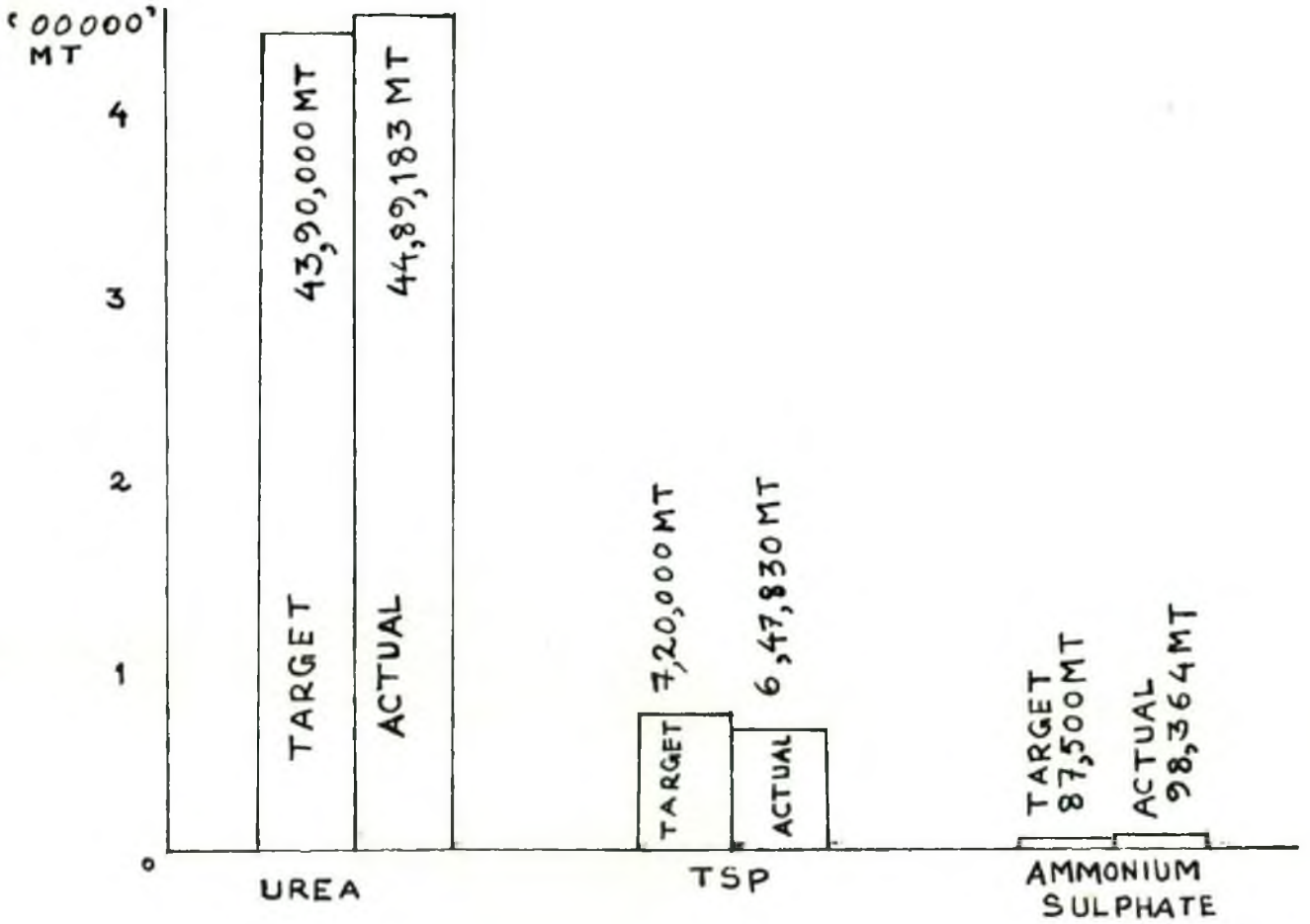

CHART : 4.01

Chart Showing Target and Actual Production of different Kinds of fertiligers in Bangladesh (1976-77 to 1985-86)

[Reference: Table 4.01]

Yearly fertilizer target and actual production can be shown by the Table-4.02 which can be presented by the Time Series (Chart-4.02) and indicates satisfactory result.

Table - 4.02

Statement of Yearwise Fertilizer Target and Actual Production in Bangladesh for the last ten years.
(1976-77 to 1985-86)

Year	Target Production MT	Actual Production MT	% of Target Achieved %	% of Capacity Utilized %
1976-77	3,38,000	3,32,788	98.46	55.10
1977-78	2,72,000	2,63,291	96.80	43.59
1978-79	3,63,000	3,58,372	98.73	59.33
1979-80	4,29,000	4,42,176	103.07	73.21
1980-81	4,14,000	4,26,004	102.90	70.53
1981-82	4,29,000	4,14,859	96.70	68.69
1982-83	4,19,000	4,51,895	107.85	74.82
1983-84	8,31,000	8,16,517	98.26	72.13
1984-85	7,74,500	8,06,380	104.12	71.23
1985-86	9,28,000	9,23,095	99.47	81.55
Total :	51,97,500	52,35,377	100.73	68.67

(Ref: Prepared by the Researcher through Budgets and Annual Reports).

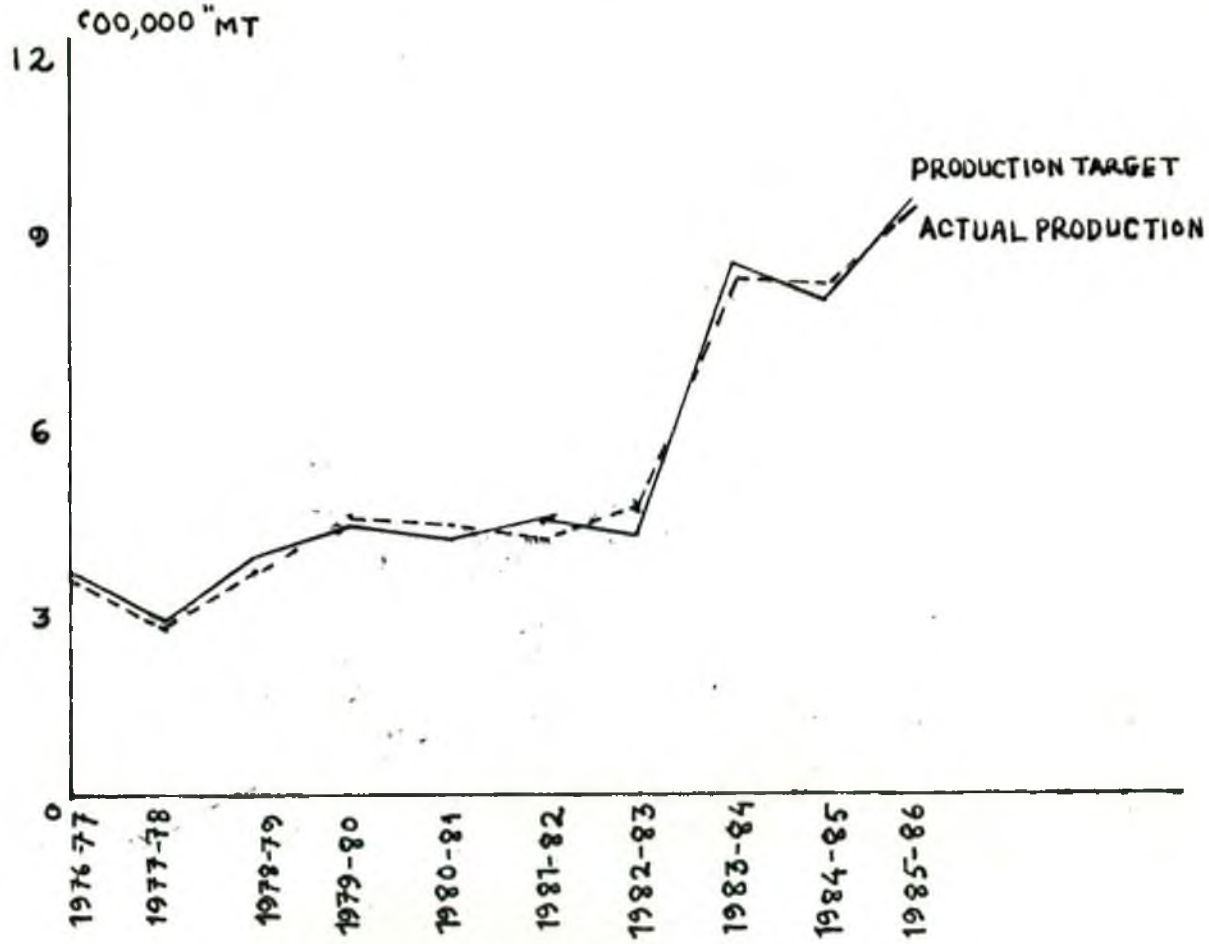

CHART: 4.02

Chart Showing fertiliger target and actual Production in Bengladesh for the last ten years (1976-77 to 1985-86)

[Reference : Table 4.02]

Yearly target and actual production of Urea, TSP and Ammonium Sulphate can be shown by the Appendix-4.04.

It mentioned earlier that the Urea fertilizer produced by three factories which can be shown separately for better presentation (Appendix-4.05).

As mentioned earlier that the management of BCIC has decided in the preparation of the Annual Budget and fixation of production target of the enterprises under BCIC (vide memo no. BCIC/CORD/300.05/947 dt. 1.1.1987) the following guidelines should henceforth be followed. The Head of Enterprise in consultation with the Director-in-Charge and if necessary, with the Production Division, Head Office shall provisionally fix the Annual Production Target before placing the same to BCIC Board of Directors for approval. The Production Division, Head Office shall consolidate the target proposals and obtain the approval of the BCIC Board of Directors.

Let us have a look for the study factories separately:

4.03.1A

Plant No. 1 : Natural Gas Fertilizer Factory Limited

If we consider the Production Target and Actual Production for the last 10 (ten) years 1976-77 to 1985-86 for the Natural Gas Fertilizer Factory Limited (Table-4.03) for its two products viz. Urea and Ammonium Sulphate. Here we are getting for the whole period (except for 1977-78 for Urea and 1978-79 for Ammonium Sulphate,actual production exceeded the target. During the period Natural Gas Fertilizer Factory Limited produced 8,40,653 MT and 98,364 MT against the target of 7,82,000 MT and 87,500 MT which means 107.50% and 112.42% of target achieved for Urea and Ammonium Sulphate Fertilizer respectively.

In 1979-80 the factory produced 1,04,594 MT Urea representing highest production since its inception and in 1982-83 produced 12,282 MT Ammonium Sulphate representing highest production since the establishment of the factory.

Table - 4.03

NATURAL GAS FERTILIZER FACTORY LIMITED

Statement showing Target and Actual Production with Capacity Utilization

Year	Urea				Ammonium Sulphate			
	Production Target MT	Actual Production MT	% of Target Achieved %	% of Capacity Utilized %	Production Target MT	Actual Production MT	% of Target Achieved %	% of Capacity Utilized %
1976-77	60,000	77,446	129.08	77.45	8,000	9,261	115.76	77.18
1977-78	70,000	61,427	87.75	61.43	9,000	9,553	106.14	79.61
1978-79	52,000	54,637	105.07	54.64	6,000	5,325	88.75	44.38
1979-80	90,000	104,594	116.22	104.59	9,000	9,852	109.46	82.10
1980-81	90,000	99,201	110.22	99.20	9,000	9,860	109.56	82.17
1981-82	85,000	92,542	108.87	92.54	9,000	11,566	128.51	96.38
1982-83	85,000	87,166	102.55	87.17	9,000	12,282	136.47	102.35
1983-84	85,000	88,044	103.58	88.04	11,000	11,027	100.24	91.89
1984-85	85,000	95,282	112.10	95.28	9,500	9,634	101.41	80.28
1985-86	80,000	80,314	100.39	80.31	8,000	10,004	125.05	83.37
Total :	782,000	840,653	107.50	84.07	87,500	98,364	112.42	81.97

Sources for Targets and Actual Productions

1. Natural Gas Fertilizer Factory Limited, Annual Budgets: 1976-77, 1977-78, 1978-79, 1979-80, 1980-81, 1981-82, 1982-83, 1983-84, 1984-85, 1985-86, Sylhet.
2. Natural Gas Fertilizer Factory Limited, Annual Reports: 1983-84, 1984-85, 1985-86, Sylhet.

In 1984-85, the production of Ammonium Sulphate declined as a result of dislocation of transportation of its basic raw-material, Sulphur, from Chittagong due to disruption of railway communication caused by devastating flood.[51]

4.03.1B

Plant no. 2: Urea Fertilizer Factory Limited.

Statement showing target and actual production with capacity utilization (Table-4.04) for the Urea Fertilizer Factory Limited for the last ten years i.e. 1976-77 to 1985-86 showed the production exceeded the target but below the installed capacity. During the period Urea Fertilizer Factory Limited, produced 24,29,634 MT against the target of 23,88,000 MT which meant 101.74% of target and 71.46% of installed capacity.

During 1984-85, the operation of the factory, remained suspended for 91 days for implementation of major rehabilitation and overhauling programme resulting in decrease of 10% production than that of previous year.[52]

As a result of the implementation of Rehabilitation Scheme Programme in 1984-85, the enterprise operated at 100% load during the year 1985-86 and achieved the highest yearly production of 3,06,690 MT since its inception.[53]

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51. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", (Dhaka), p.11.

52. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", (Dhaka), p.11.

53. Bangladesh Chemical Industries Corporation, "Annual Report 1985-86", (Dhaka), p.19.

Table - 4.04

Urea Fertilizer Factory Limited
Ghorasal, Narsingdi

Statement showing Targets and Actual Production with capacity Utilization

Year	Production		% of Target achieved	% of Capacity utilized
	Target	Actual		
	MT	MT	%	%
1976-77	2,20,000	2,08,075	94.58	61.20
1977-78	1,53,000	1,51,037	98.72	44.42
1978-79	2,35,000	2,36,123	100.48	69.45
1979-80	2,50,000	2,56,612	102.64	75.47
1980-81	2,40,000	2,45,482	102.28	72.20
1981-82	2,50,000	2,52,863	101.15	74.37
1982-83	2,50,000	2,83,844	113.54	83.48
1983-84	2,65,000	2,57,164	97.04	75.64
1984-85	2,25,000	2,31,744	103.00	68.16
1985-86	3,00,000	3,06,690	102.23	90.20
Total :	23,88,000	24,29,634	101.74	71.46

Sources for targets and actual production:

1. Urea Fertilizer Factory Limited, Annual Budgets: 1976-77, 1977-78, 1978-79, 1979-80, 1980-81, 1981-82, 1982-83, 1983-84, 1984-85, 1985-86. Ghorasal, Narsingdi.
2. Urea Fertilizer Factory Limited, Annual Report and Accounts: 1985-86, Ghorasal, Narsingdi.

Finance Director, BCIC, and Chairman, UFFL Enterprise Board, in his forewording in the Annual Report of 1985-86, expressed as, it is a matter of proud and happiness to say that the year was a very successful in the life of UFFL while the factory produced the ever highest production which is a very rare achievement in fertilizer industry.[54]

4.03.1C

Plant no. 3: Triple Superphosphate Complex Limited:

Statement showing target and actual production with capacity utilization (Table-4.05) for the Triple Superphosphate Complex Limited for the last ten years i.e. 1976-77 to 1985-86. During the period the complex produced 6,47,830 MT against the target of 7,20,000 MT which represented 89.98% of target achieved and 42.62% of capacity utilized.

In TSP Complex during 1984-85, the production was affected for implementation of rehabilitation scheme for 146 days and installation of gas conversion system causing considerable loss of production.[55] The factory carried out "Fertilizer Industries Rehabilitation Programme" from 1.1.85 to 25.4.85 in order to produce granular TSP and increased the effective production capacity utilization to 1,50,000 MT per year.[56]

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54. Urea Fertilizer Factory Limited, "Annual Report and Accounts 1985-86", (Ghorasal), p.3.

55. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", (Dhaka), p.11.

56. Ibid., p.20.

Table - 4.05

Triple Superphosphate Complex Limited
North Potenga, Chittagong

Statement showing targets and actual production with capacity utilization

Year	Production		% of Target achieved	% of Capacity utilized
	Target	Actual		
	MT	MT	%	%
1976-77	50,000	38,006	76.01	25.00
1977-78	40,000	41,274	103.19	27.15
1978-79	70,000	62,287	88.98	40.98
1979-80	80,000	71,118	88.90	46.79
1980-81	75,000	71,461	95.28	47.01
1981-82	85,000	57,888	68.10	38.08
1982-83	75,000	68,603	91.47	45.13
1983-84	90,000	81,243	90,27	53.45
1984-85	55,000	55,192	100.35	36.31
1985-86	100,000	100,758	100.76	66.29
Total:	720,000	647,830	89.98	42.62

Sources for Targets and Actual Production:

1. Triple Superphosphate Complex Limited, Annual Budgets: 1976-77, 1977-78, 1978-79, 1979-80, 1980-81, 1981-82, 1982-83, 1983-84, 1984-85, 1985-86, Chittagong.

2. Triple Superphosphate Complex Limited, Annual Reports: 1983-84, 1984-85, 1985-86, Chittagong.

4.03.1D

Plant no. 4: Zia Fertilizer Company Limited:

Zia Fertilizer Company Limited was commissioned on 15th December, 1981 and went into commercial production in 1983-84. If we consider the production target and actual production for the last 3 (three) years 1983-84 to 1985-86. During the period the factory produced 12,18,896 MT against the target of 12,20,000 representing 99.91% of target achieved and 76.95% of capacity utilized (Table-4.06).

The factory produced 4,25,329 MT of Urea Fertilizer during the year 1985-86 - the ever highest production since the inception.[57]

Table - 4.06

Zia Fertilizer Company Limited
Ashugonj, Brahmanbaria

Statement showing targets and actual production with capacity utilization

Year	Production		% of Target achieved	% of Capacity utilized
	Target	Actual		
Commercial Production started in 1983-84				
	MT	MT		
1983-84	3,80,000	3,79,039	99.75	71.79
1984-85	4,00,000	4,14,528	103.63	78.51
1985-86	4,40,000	4,25,329	96.67	80.55
Total :	12,20,000	12,18,896	99.91	76.95

Sources of Target and Actual Production:

1. Zia Fertilizer Company Limited, Annual Budgets: 1983-84, 1984-85, 1985-86, Ashugonj, Brahmanbaria.
2. Zia Fertilizer Company Limited, Annual Reports: 1983-84, 1984-85, 1985-86, Ashugonj, Brahmanbaria.

57. Zia Fertilizer Company Limited, Annual Report 1985-86 (Ashugonj).

4.03.2 PRODUCTION COST

Production cost plays as pointed out in some earlier chapter a dominating role in fixing selling price and it should be regulated properly. Accordingly it has been nicely pointed out by Professor Paul[58] that all production costs move through the accounting system in the form of inventories and ultimately become a part of the cost of goods manufactured and sold. He has also stated that the amount of materials, labour and overhead processed through the system varies slightly depending on whether standard costs or actual costs of production are used. If the views of Professor Paul is browsed, one aspect appears to be very prominent which is integrity of all elements of costs. Here view of Mr. Fuchs appears to be worth mentioning. He is of opinion that the integrity of all cost control elements throughout the production cycle is dependent upon accurate and reliable engineering documentation.[59]

Experts[60] of the World Bank have aptly reported that cost minimization is one of many objectives that may be considered to be important in the development of the fertilizer sector. Experts[61] of the Asian Development Bank have argued that the production cost structure of the Urea in the Chittagong Urea Fertilizer Factory is capital intensive; capital-related cost (i.e. depreciation and interest expense) will account for 55 per cent of the total production cost.

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58. Lucas, D. Paul, Accounting Desk Book for Manufacturing Companies. (Englewood Cliff: Prentice-Hall, Inc., 1979), p.52.

59. Fuchs, Jerome H., Computerized Cost Control Systems, (Englewood Cliff: Prentice-Hall, Inc., 1976), p.48.

60. World Bank, A Programming Approach to Fertilizer Sector Planning, (Washington: World Bank Staff Working Paper no.305, 1978), p.7.

61. Asian Development Bank, Appraisal of the Chittagong Urea Fertilizer Project in People's Republic of Bangladesh, (Dhaka: 1981), p.52.

Production cost of urea by and large consists of capital servicing cost (depreciation, interest/return on investment).[62]

Planning Commission consultants[63] who were commissioned to study the cost structure of the fertilizer plants and the scope of reducing government subsidy to the fertilizer industry in the country reported that so far the cost domestically produced fertilizer was concerned, it might be reduced by raising the operational efficiency of the fertilizer plants and the cost of production of local TSP was too much compared to the cost of imported TSP. They also argued that there is scope for effecting economies in respect of labour and administrative cost which is around 89 percent of the total cost of production and these are evidences of extra-vagances and avoidable wastages.

One Bangladesh academician has argued that the socialist accounting system can help us to reorganise our accounting system specially in nationalised sector, to use it as a control tool for achieving efficient performances in this sector.[64] He described, in the planned economy the accounts are divided in 11 groups of which cost of production is one. This group accounts for all expenses relating to production including direct labour and transformed labour. All expenses of production are planned and treated according to elements of cost (mainly for planning purpose) and according to items of calculation (for control purpose). Reports on cost of production should exhibit

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62. Government of the People's Republic of Bangladesh, "Industrial Worker's Wage and Productivity Commission", 1978, p.156.

63. Habibullah, M., Ghosh, S.N., Helaluzzaman, A.K.M., Quddus, M.A., Chowdhury, M.H., A Study of Government Subsidy to Fertilizer, (Dhaka: Planning Commission, Government of the People's Republic of Bangladesh, 1980), p.85.

64. Shaha, Saroj Kumar, "Accounting System in Planned Economy", The Dhaka University Studies, Part-C, (Dhaka: 1987), p.29.

the actual expenses showing the variances from the standard/norm as per elements/items of cost, cost of production of finished goods, newly developed goods, fulfilment of plan for minimizing the cost, cost per one monetary unit value of finished product, loss and wastage in production etc. Accounts for cost of production are kept as per department, divisions and worker's group in order to control the process of fulfilment of planned duty.

In this study period of 5 (five) years have been taken for analysis i.e. for the period from 1981-82 to 1985-86. The production cost of the fertilizer may be shown below:

Table - 4.07

Fertilizers	Quantity produced MT	Production cost	Cost per MT
		Amount Lac Tk	Taka
A. Urea	29,94,549	84,013.69	2,805.55
B. TSP	3,63,684	24,246.01	6,666.78
C. Ammonium Sulphate	54,513	1,652.23	3,030.89
Total :	34,12,746	109,911.93	3,220.63

Yearly total production and production cost for the different fertilizer factories are shown in tables 4.08 and 4.09 respectively.

Table - 4.08

Yearly Production

(Quantity in MT)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Total
A. Urea:						
NGFF	92,542	87,166	88,044	95,282	80,314	4,43,348
UFFL	252,863	283,844	257,164	231,744	306,690	13,32,305
ZFCL	-	-	379,039	414,528	425,329	12,18,896
	345,405	371,010	724,247	741,554	812,333	29,94,549
B. TSP:						
TSPC	57,888	68,603	81,243	55,192	100,758	3,63,684
C. Ammonium Sulphate:						
NGFF	11,566	12,282	11,027	9,634	10,004	54,513
Total: (A+B+C)	414,859	451,895	816,517	806,380	923,095	34,12,746

Source: Audit Report of different Factories.

Table - 4.09

Yearly Production Cost

(Amount in lac taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Total
A. Urea:						
NGFF	2,136.62	2,246.25	2,321.35	2,960.78	3,497.63	13,161.63
UFF	4,575.23	4,538.84	4,524.68	5,475.94	6,750.81	25,865.50
ZFCL	-	-	13,985.92	13,683.98	17,316.66	44,986.56
	6,710.85	6,785.09	20,831.95	22,120.70	27,565.10	84,013.69
B. TSP:						
TSPC	3,642.50	4,309.06	5,039.72	3,801.75	7,452.98	24,246.01
C. Ammonium Sulphate:						
NGFF	310.48	325.19	285.77	305.41	425.38	1,652.23
Total (A+B+C) :	10,663.83	11,419.34	26,157.44	26,227.86	35,443.46	1,09,911.93

Sources: Audit Report of different fertilizer factories.

4.04 CATEGORISATION INTO FIXED COST AND VARIABLE COST

Matz and Usry[65] categorically argues that it is impossible to budget and control costs successfully without regard to their tendency to be fixed or variable; the division is a necessary prerequisite to successful budgeting and intelligent cost planning and analysis. According to Backer and Jacobsen,[66] "a knowledge of the variability of costs is essential not only to cost accountants, but to all business executives, it is of the essence in profit planning, cost control and decision making".

From the standpoint of accounting and control overhead expenses may be classified under four heads:

a) Fixed Overhead,

b) Semi-Fixed Overhead,

c) Variable Overhead, and

d) Semi-Variable Overhead.

According to J.J.W. Neuner,[67] most fixed items are based upon the time element, such as week, month, or year, not on the quantity of production. Hence, the per unit cost of fixed overhead costs will vary inversely with the volume produced, whereas variable overhead costs are those which tend to fluctuate in direct proportion to the volume of production.

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65. Matz, Adolph, and Usry, M.F., Cost Accounting, (Ohio: South-Western Publishing Co., 1982), p.48.

66. Backer, Morton, and Jacobsen, L.E., Cost Accounting, (New York: McGraw-Hill Book Company, 1964), pp.13-14.

67. Neuner, John J.W., Cost Accou g, (Illinois: Richard D. Irwin, Inc., 1952), p.26.

Since fixed cost remains fixed in total, the incidence of fixed overhead on unit cost decreases with the increase in the volume of production and vice versa but variable costs are expected to vary directly with the volume, it follows that unit variable cost is likely to be constant at all levels while total variable cost will tend to vary directly with the volume.

Fixed expenses are thus period costs representing a constant amount of expenditure during a particular period and thus called as shutdown or stand by costs. Fixed cost falls under the category on non-controllable cost from the management control point of view as there is practically no scope of reduction of the amount of expenditure by the action of any executive once certain facilities are installed. However, it is desirable to have most effective utilisation of plant capacity in order to reduce the fixed cost per unit to the minimum.

Fixed expenses are incurred by management decisions and as such can be controlled by the top management while the variable expenses can be controlled by the lower levels of management. By segregating these, the lower levels of management will know the types of expenditure which is within their control.

In short, classification of all expenses into fixed and variable is highly helpful to the management for the efficient running of the factory. It is not only helpful for cost finding but also for cost control and managerial decision-making.

In this study all costs may be placed in one of these two classifications, viz.

(i) Fixed cost,

(ii) Variable cost.

The table (Table-4.10) shows that fixed cost and variable cost per MT is increasing with the change of time for all the products e.g. Urea, TSP and Ammonium Sulphate fertilizer.

The increase in fixed cost during 1984-85 was mainly on the account of depreciation, wages and salaries due to enhancement of DA, house ceiling, payment of arears, fixed electricity expenses due to enhancement of electricity duty of self generation, fixed overhead expenses due to over-hauling work executed in different enterprises.[68]

Variable cost is varying with the production unit and hence there is no scope of reducing variable cost. Though there is no scope of reducing fixed cost but if we can increase production unit then per unit fixed cost will automatically come down.

Total production cost comprising fixed cost and variable cost for the selected fertilizer factories are shown separately, such as:

1. Natural Gas Fertilizer Factory Limited.
   a. Urea : Appendix-4.06
   b. Ammonium Sulphate: Appendix-4.07
2. Urea Fertilizer Factory Limited. Appendix-4.08
3. Triple Superphosphate Complex Limited. Appendix-4.09
4. Zia, Fertilizer Company Limited. Appendix-4.10.

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68. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", Dhaka, p.14.

Table - 4.10

Production Cost

Statement showing Categorisation into Fixed Cost and Variable Cost

(Cost per MT in Taka)

Particulars		1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:							
NGFF :	FC	935.15	1,194.23	1,403.19	1,414.71	2,466.98	1,482.85
	VC	1,372.58	1,382.75	1,233.39	1,692.68	1,887.96	1,513.87
	Total:	2,307.73	2,576.98	2,636.58	3,107.39	4,354.94	2,996.72
UFFL :	FC	546.37	401.41	539.76	788.08	840.22	623.17
	VC	1,263.00	1,197.65	1,219.69	1,574.85	1,360.96	1,323.23
	Total:	1,809.37	1,599.06	1,759.45	2,362.93	2,201.18	1,946.40
ZFCL :	FC	-	-	2,848.15	2,374.26	2,890.53	2,704.31
	VC	-	-	841.69	926.84	1,180.83	983.12
	Total:	-	-	3,689.84	3,301.10	4,071.36	3,687.43
B. TSP:							
TSPC :	FC	790.49	1,069.66	960.68	1,753.97	1,379.06	1,190.77
	VC	5,501.83	5,211.49	5,242.59	5,134.26	6,017.85	5,421.61
	Total:	6,292.32	6,281.15	6,203.27	6,888.23	7,396.91	6,612.38
C. Ammonium Sulphate:							
NGFF :	FC	612.05	485.92	586.56	863.09	1,140.14	737.55
	VC	2,072.37	2,161.78	2,004.99	2,307.04	3,111.96	2,331.63
	Total:	2,684.42	2,647.70	2,591.55	3,170.13	4,252.10	3,069.18

Note: FC = Fixed Cost
VC = Variable Cost

Reference: Prepared by the Researcher through the Audit Reports.

4.05 CONTROLLABILITY OF COST

When cost figures are used to measure efficiency of operations, the question of cost controllability often arises. Under this, costs are classified according to whether or not they are influenced by the actions of a given number of the undertaking. On this basis cost is classified into:

(a) Controllable costs,

(b) Uncontrollable costs.

The distinction between controllable and noncontrollable cost should be made quite clearly on the performance report. Departmental cost reports should be designed to emphasize the items that are subject to control by the department managers. It is true that many companies follow the practice of showing a portion of noncontrollable cost on each department's operating report. Large noncontrollable variances tend to obscure the effectiveness of the department manager in cost control.

Numerous factors beyond the control of the executive whose results are judged by the cost figures affect the cost figures of his department. For example, the foreman can not control the prices of the materials used in his department although he can control the quantity consumed through more careful supervision and inspection and thus avoid errors and wastes on the part of his workmen.

C.T. Horngren[69] defines, controllable costs are those that are definitely influenced by a given manager within a given time span.

According to Gordon Shillinglaw,[70] controllability requires a specification of the time span and the control unit. All costs are controllable in some degree at some time by some one. Costs that are not controllable at one level may be controllable at the next. Generally speaking, all direct costs including direct material, direct labour and some of the overhead expenses are controllable by lower level of management. On the other hand, most of the fixed costs are uncontrollable. The distinction between controllable and uncontrollable is sometimes left to individual judgement and is not sharply maintained. It is only in relation to a particular level of management or an individual manager that we may say whether a cost is controllable or uncontrollable. A particular item of cost which may be controllable from the point of view of one level of management, may be uncontrollable from another point of view. Moreover, there may be an item of cost which is controllable from long term point of view and uncontrollable from short term point of view.

For effective cost control and cost reduction, it is necessary to determine which costs are controllable and which are uncontrollable, to what extent each of the controllable costs is controllable and by whom it is controllable.

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69. Horngren, Charles T., Cost Accounting, (Englewood Cliffs: Printice-Hall, Inc., 1983), p.147.

70. Shillinglaw, Gordon, Cost Accounting, (Illinois: Richard D. Irwin, Inc., 1961), p.105.

4.06 CATEGORISATION INTO MATERIAL COST, LABOUR COST AND OVERHEAD COST

G. Shillinglaw[71] explain that the multipurpose nature of accounting data gives rise to a multiplicity of cost classifications. According to Owler and Brown,[72] "If management is to be provided with the data required for cost control it is necessary to analyse and classify costs". According to J.J. W. Neuner,[73] the cost of manufacturing a unit or a group of units of any product is made up of three elements: Direct Materials, Direct Labour and Manufacturing Overhead. The Institute of Cost and Works Accountants of England defines, 'Elements of Costs' as "the primary classification of costs according to the factors upon which expenditure is incurred, viz. Material cost, Wages (Labour Cost) and Expenses". Strictly speaking, the elements of cost are three i.e., Materials, Labour and other Expenses. Manufacturing costs are composed of three major elements:[74]

1. Direct Materials: Direct materials are materials that go into the finished product and which may be conveniently assigned to specific physical units.

2. Direct Labour: Direct labour is that portion of labour directly related or expediently identified to specific products.

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71. Shillinglaw, Gordon, Cost Accounting, (Illinois: Richard D. Irwin, Inc., 1961), p.106.

72. Owler, L.W.J., and Brown, J.L., Wheldon's Cost Accounting, (London: Macdonald & Evans Ltd.,

73. Neuner, John J.W., Cost Accounting, (Illinois: Richard D. Irwin, Inc., 1952), p.5.

74. Cecil, Gillespic, Cost Accounting and Control, Englewood Cliffs, New Jersey, 1957, p.86.

3. Factory Overhead: Factory overhead is comprised of all factory costs exclusive of direct material and direct labour. For example, indirect material, indirect labour, supplies, heat, light, etc. are included in this element of manufacturing costs.

The Bangladesh Chemical Industries Corporation presently grouping manufacturing cost as material cost and conversion cost. Conversion cost defined by different writers from the different angles but the subject matter is the same. As defined by Backer and Jacobsen,[75] "The combination of direct labour and factory overhead is known as conversion cost, or processing cost, because these are the cost of converting or processing raw materials into finished products". In fine, the researcher defines, Conversion cost is the cost of converting raw material to the finished state, or the cost of converting a material from one production stage to another which includes direct wages, direct expenses and applied factory overheads.

The third element of production cost is overhead expenditure. Boardly speaking, overhead expenditures are of two types:

(i) Manufacturing Overhead, and

(ii) Non-manufacturing overhead.

Generally manufacturing overhead is charged to the manufacturing account and non-manufacturing overhead (administrative, selling and distribution overhead expense) is charged to the profit and lost account.

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75. Backer, Morton, and Jacobsen, L.E., Cost Accounting. (New York: McGraw-Hill Book Company, 1964), p.5.

No business enterprise is free of problems in control of overhead costs and the application of overhead to the product.[76] Therefore, management should take great care regarding the control of this element of cost. Overhead cost control involves:

(i) Budgeting, classification and collection of overhead,

(ii) Distribution of overhead to production and service departments,

(iii) Absorption of overhead by production units, and

(iv) Analysis over-or under-recovery of overheads.

The elementwise production cost i.e. material cost, labour cost, overhead may be presented in Table-4.11.

4.07 COST BREAK-UP

Production costs are now classified by the researcher into eleven categories for better comparison and analysis and presented the same in percentage basis (Table-4.12).

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76. Thomas, S. Dudick, Cost Control for Industries, Prentice-Hall Inc., Englewood Cliffs, N.J., 1962, p.25.

Table - 4.11

Statement showing Categorization into Material Cost, Labour Cost and Overhead Cost.

(Cost per MT in Taka)

Particulars		1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:							
NGFF :	MC	1,197.98	1,219.23	1,006.19	1,408.14	1,446.42	1,255.59
	LC	299.20	317.42	463.43	452.92	833.33	473.26
	OH	810.55	1,040.33	1,166.96	1,246.33	2,075.19	1,267.87
	Total:	2,307.73	2,576.98	2,636.58	3,107.39	4,354.94	2,996.72
UFFL :	MC	915.17	851.85	899.23	1,265.61	1,010.21	988.42
	LC	96.12	89.24	146.45	163.03	203.18	139.60
	OH	798.08	657.97	713.77	934.29	987.79	818.38
	Total:	1,809.37	1,599.06	1,759.45	2,362.93	2,201.18	1,946.40
ZFCL :	MC	-	-	768.45	847.00	1,033.39	882.95
	LC	-	-	81.31	83.63	126.25	97.06
	OH	-	-	2,840.08	2,370.47	2,911.72	2,707.42
	Total:	-	-	3,689.84	3,301.10	4,071.36	3,687.43
B. TSP:							
TSPC:	MC	4,824.05	4,654.30	4,550.25	4,422.35	5,359.43	4,762.08
	LC	264.79	238.31	342.54	473.24	431.70	350.12
	OH	1,203.48	1,388.54	1,310.48	1,992.64	1,605.78	1,500.18
	Total:	6,292.32	6,281.15	6,203.27	6,888.23	7,396.91	6,612.38
C. Ammonium Sulphate:							
NGFF :	MC	1,791.63	2,021.01	1,865.33	2,095.50	2,921.33	2,138.96
	LC	148.19	137.11	213.20	295.00	408.94	240.49
	OH	744.60	489.58	513.02	779.63	921.83	689.73
	Total:	2,684.42	2,647.70	2,591.55	3,170.13	4,252.10	3,069.18

Notes: MC = Material Cost; LC = Labour Cost; OH = Overhead Cost.

Reference: Prepared by the Researcher through the Audit Report.

Table - 4.12

Fertilizer Industry in Bangladesh

Statement of average yearly production cost percentage

(1981-82 to 1985-86)

(In Percentage)

Cost of Production	Urea				TSP	Ammo. Sul.
	NGFF	UFFL	ZFCL	Average	TSPC	NGFF
Material cost	43.18	50.88	23.96	39.34	72.15	69.97
Labour cost	15.32	7.07	2.61	8.33	5.25	7.57
Power & Fuel	1.51	7.36	0.13	3.00	5.37	1.08
Stores, spares and accessories	5.51	6.53	1.86	4.63	3.61	5.58
Factory overhead	2.72	5.05	3.89	3.89	1.88	4.21
Administrative overhead	3.31	1.76	0.97	2.01	2.13	3.06
Selling & Distribution overhead	0.28	2.53	0.10	0.97	0.07	0.39
Insurance	0.14	0.10	0.98	0.41	0.21	0.03
Depreciation	14.98	14.45	38.69	22.71	4.34	5.20
Interest & fin charges.	11.25	2.05	25.88	13.06	4.68	1.56
Head Office Overhead	1.80	2.22	0.93	1.65	0.31	1.35
Total Production Cost	100	100	100	100	100	100

References: Prepared by the Researcher through Audit Reports.

Cost of production of different kinds of fertilizers viz., Urea, TSP, and Ammonium Sulphate can also be represented separately by the Pie-chart to make the cost break up readily comparable. Such as:

(a) Urea: Pie-chart showing different categories of yearly average production cost. (Chart 4.03)

(b) TSP: Pie-chart showing different categories of yearly average production cost. (Chart 4.04)

(c) Ammonium Sulphate: Pie-chart showing different categories of yearly average production cost. (Chart 4.05).

Let us discuss different categories of production cost separately.

4.07.01 MATERIAL COST

The first and the most important element of cost is the direct material. As per Backer and Jacobsen,[77] materials which actually form a part of the finished product are known as direct materials. In most manufacturing units, the cost of raw materials represents high proportion of the total cost of production. Materials, as for instance, account for as much as 56 to 69 percent, of the total cost of the products all the world over.[a] The system of material control

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77. Backer, Morton, and Jacobsen, L.E., Cost Accounting, (New York: McGraw-Hill Book Company, 1964), p.57.

a. Materials cost as percent of total cost: USA-59; UK-61; Japan-56; Italy-62; Iran-66; India-66; Mexico-64 (S. Venue, Inventory Control and Management, Lok Udyog, January 1972, p.1013).

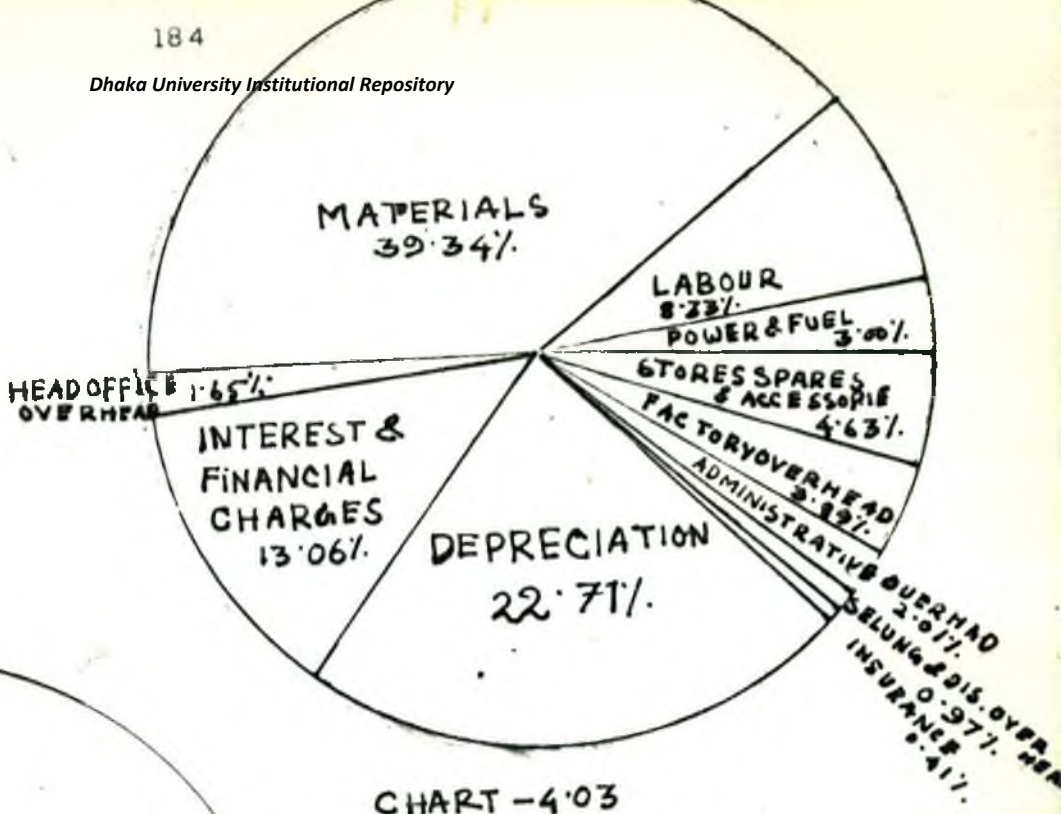

CHART – 4·03

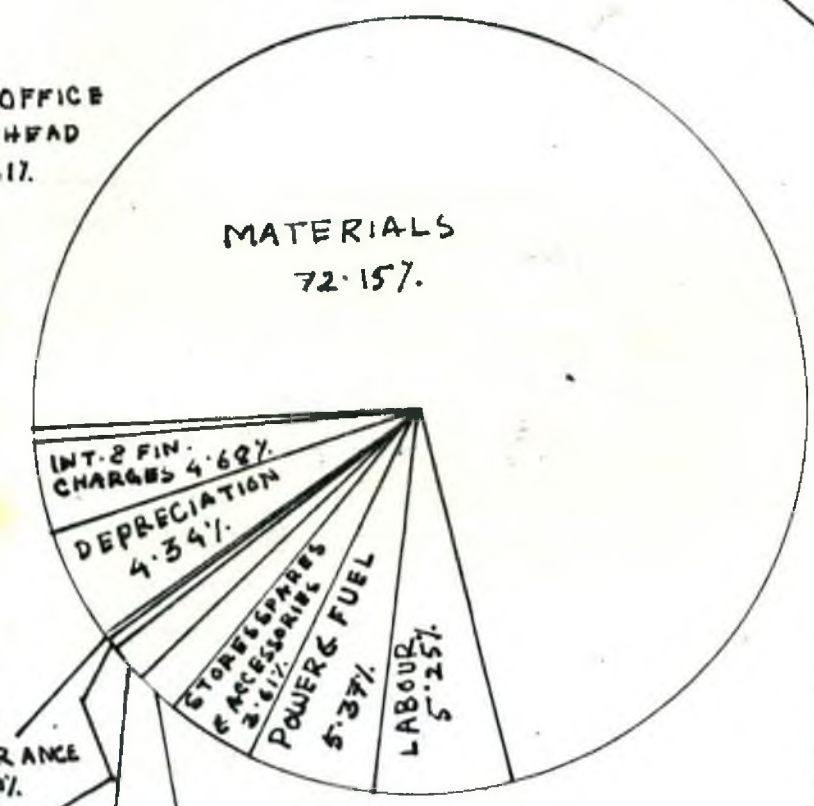

CHART – 4·04

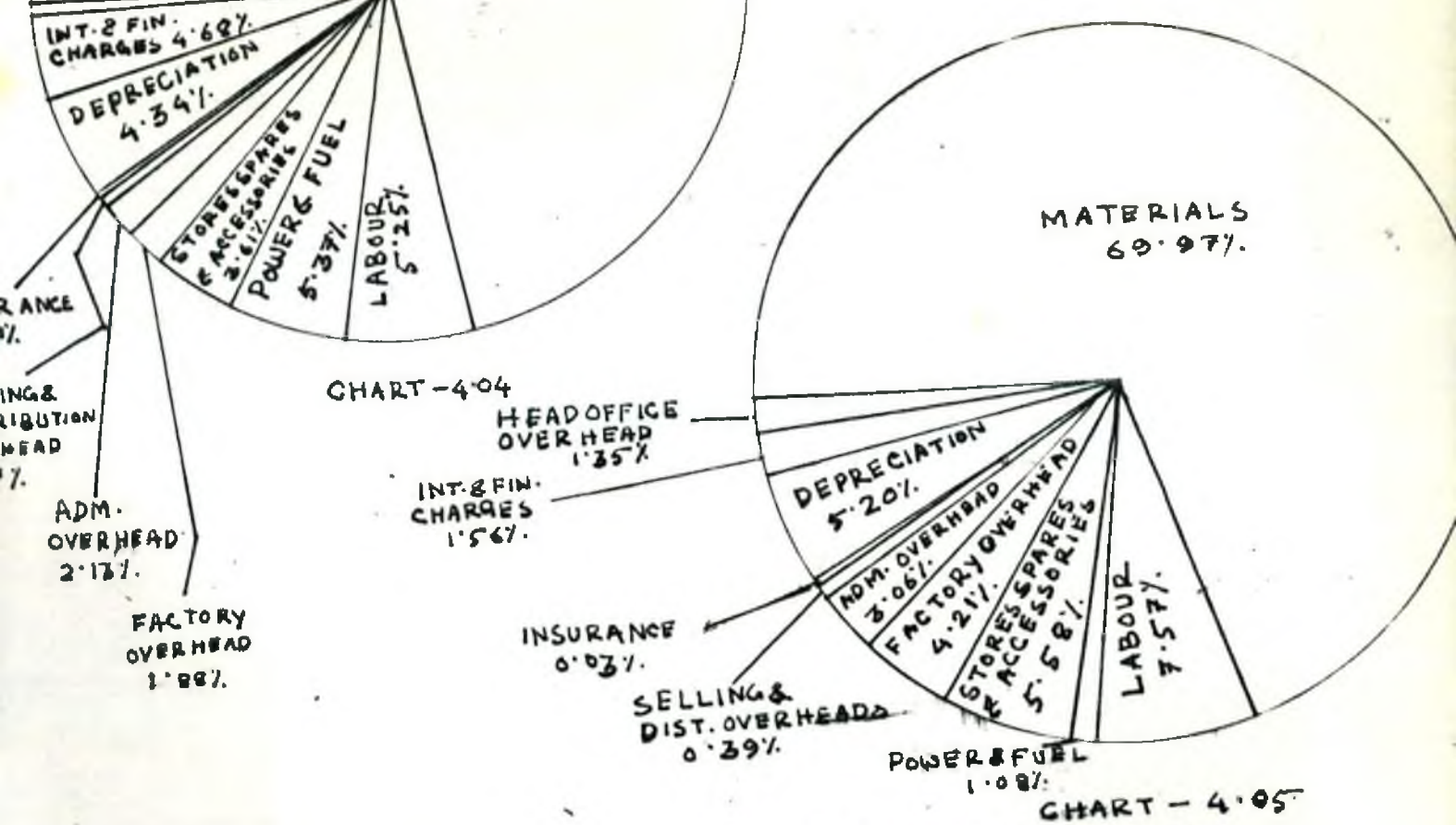

CHART – 4·05

Reference : Table – 4·12

should be so comprehensive that it covers the whole procedure from the point when some one places an order with the suppliers upto the stage until the materials are consumed. Management's primary interest in materials costs focuses on the relationship between the input cost of materials used in production and the physical production output. According to Matz and Usry,[78] a basic objective of good materials control is the ability to place an order at the right time with the right source to acquire the right quantity at the right price and quality. The control of materials is therefore an important function of cost control so that the cost of materials may be kept to the minimum possible level.

Material management is a discipline generally unknown to many business executives of our country, mainly because of low level of business education.[79] Too great a supply of stock results in high storage costs, excessive capital being locked up, shortage of valuable space, stock losses and obsolescence, while a short supply results in reduced output and possibly panic buying. In material control, the problem is to establish optimal stock levels and it will be appreciated that this is a difficult problem, because of the uncertainty of the supply of, and demand for, materials.[80]

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78. Matz, Adolph, and Usry, M.F., Cost Accounting, (Ohio: South-Western Publishing Co., 1982), p.381.

79. Mohiuddin, Md, "Inventory Management", paper presented in the seminar on "Cost Audit and Inventory Management", December 14&15, 1985, sponsored by the Institute of Cost and Management Accountants of Bangladesh, Dhaka.

80. Owler, L.W.J. and Brown, J.L., Wheldon's Cost Accounting, (London: McDonald & Evans Ltd., 1984), p.42.

According to J.W. Keller[81] (Past, President of the National Association of Cost Accountants, USA), material is cash in another form and it should have the same care and control as cash. He categorically mentioned, there are eight areas of control of material costs and accounting is involved in each one of them. These areas are: (1) Specifications, (2) Purchasing, (3) Inventory, (4) Usage, (5) Scrap, (6) By-products and joint products, (7) Salvage, (8) Indirect costs.

The profitability of a number of enterprises under the Corporation (BCIC) was adversely affected due to continued increase in the prices of local and foreign raw materials.[82]

In Bangladesh Chemical Industries Corporation, materials constitute the major segment of cost of production. The corporation has made consistent endeavour to use the most economical raw material without affecting quality. In many enterprises, alternative materials are now being used with consequential reduction in the cost of production.[83] Proper material accounting and checking of usage ratio has increased productivity and thereby reduced cost of production of all items. There has been a substantial reduction in material usage ratio in all factories, particularly natural gas consumption in fertilizer factories, furnace oil consumption in newsprint and rock sulpher and rock phosphate consumption in TSP.[84] As a matter

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81. Keller, J. Wayne, "The Critical Areas of Material Cost Control", NACA Bulletin, (USA: National Association of Cost Accountants, 1948), p.592.

82. Bangladesh Chemical Industries Corporation, "Annual Report 1981-82", (Dhaka), p.14.

83. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, Dhaka, p.20.

84. Ibid., p.22.

of policy, the usage of raw material per unit of finished product is carefully analysed in each enterprise. Head Office Production Division makes very careful analysis and in case of any unfavourable trend, brings it to the notice of all concerned for necessary corrective action. In a good number of cases, the efforts of the corporation have yielded worthwhile results in terms of reduced material usage per unit of output. In Urea Fertilizer Factory, the usage of natural gas was 40.61 MCF in 1978-79 per ton of urea fertilizer, it went down to 34.02 MCF in 1985-86.[85] To operate efficiently at minimum cost level, many of the enterprises have to have long term supply contract for materials and spares.[86] While exercising elaborate financial control system, attention is also paid on reducing the usage of raw material and improving intput-output ratio of production. To keep track on the use of raw material and thereby reducing cost of production, actual usage of raw materials is compared with the standard and any deviation is properly recorded for taking necessary remedial measures. Each enterprise now has a separate Material Planning and Inventory Control Cell to ensure adequate and regular supply of raw materials as well as to avoid blocking up of fund and inventory build-up. The corporation head office has also set up a Material Planning & Inventory Control Cell to monitor, co-ordinate and plan the over-all inventory system of

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85. Ibid., p.20.

86. Ahmed, Muzaffer, "Prospects and Problems of Nationalised Industries : A Critical Review of Views", Managerial, Business and Economics, (Dhaka: The Institute of Business Administration, University of Dhaka, 1975), p.37.

the corporation.[87] A Meeting of Head of Accounts of BCIC Enterprises was held on 22nd and 23rd September, 1985 in Dhaka, the Chief Guest and Chairman, BCIC, stressed on the economy in the procurement of materials and proper material planning and inventory control. He gave emphasis on procurement of right materials at right quantity at right time and at right price. Because materials constitute such a significant part of production cost and since this cost is controllable, proper planning, purchasing, handling and accounting are great importance.

In the Bangladesh Chemical Industries Corporation, Material costs consists of:

(a) Raw materials,

(b) Chemicals, and

(c) Packing materials,

which is also applicable in the fertilizer sector.

Different categories of materials which (generally within the above three classes) are required for producing different kinds of fertilizers. Raw material represents water, gas and electricity for producing Urea. Let us have a look on the material cost for different fertilizer factories for different years (Table.4.13) which can also be presented by time series (chart-4.06).

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87. Bangladesh Chemical Industries Corporation, Annual Report 1984-85", (Dhaka), pp.12-13.

Table - 4.13

Material Cost per MT

(Amount in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	1,197.98	1,219.23	1,006.19	1,408.14	1,446.42	1,255.59
UFFL	915.17	851.85	899.23	1,265.61	1,010.21	988.42
ZFCL	-	-	768.45	847.00	1,033.39	882.95
	1,056.58	1,035.54	891.29	1,173.58	1,163.34	1,042.35
B. TSP:						
TSPC	4,824.05	4,654.30	4,550.25	4,422.35	5,359.43	4,762.08
C. Ammonium Sulphate:						
NGFF	1,791.63	2,021.01	1,865.33	2,095.50	2,921.33	2,138.96

Reference: Prepared by the Researcher through Audit Reports.

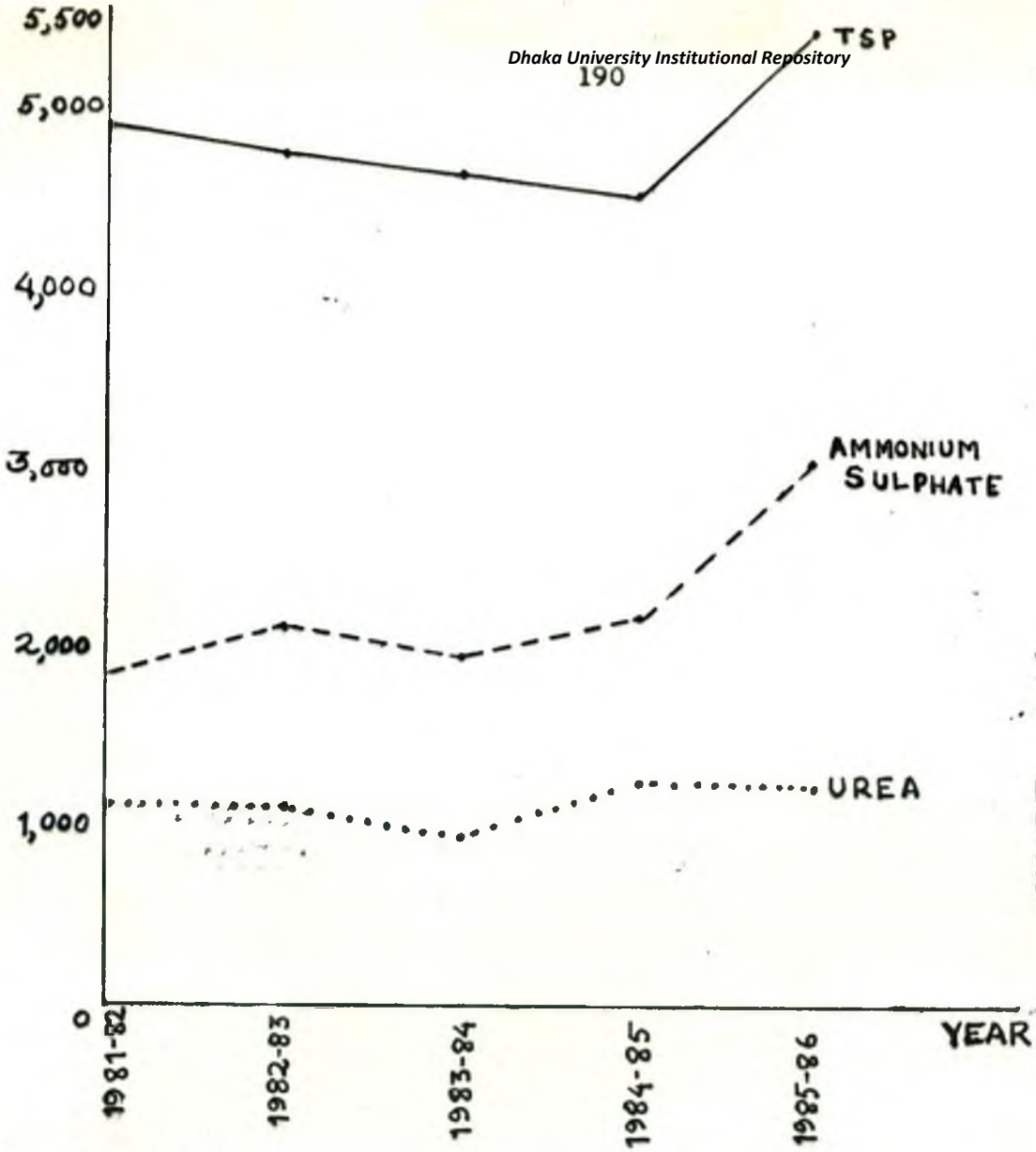

CHART - 4.06

Time Series showing Material cost per metric ton of Urea, TSP and Ammonium Sulphate for the last five years (1981-82 to 1985-86)
[Reference: Table - 4.35]

a. Urea:

Material cost for producing one ton of urea in 1983-84 were Tk.1,006.19, Tk.899.23, and Tk.768.45 for NGFF, UFFL and ZFCL respectively which increased in 1985-86 at Tk.1,446.42, Tk.1,010.21 and Tk.1,033.39. Though these three fertilizer factories producing the same quality of urea but their material cost is varying year to year. As per autonomous bodies budgets, material costs budgeted for 1986-87 to Tk.1,250.00 per ton of urea.[88]

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88. Government of the People's Republic of Bangladesh, Autonomous Bodies Budgets 1986-87, (Dhaka: Ministry of Finance, 1986), p.25.

b. TSP:

Material cost per MT of TSP in 1981-82 was Tk.4,824.05 and in 1985-86 increased to Tk.5,359.43. Details discussion have been made in the material cost of Triple Superphosphate Complex Limited.

c. Ammonium Sulphate:

Material cost is increasing year after year. In 1981-82, material cost per MT was Tk.1,791.63 and in 1985-86 increased to Tk.2,921.33. Details discussed in the material cost of Natural Gas Fertilizer Factory Limited in Ammonium Sulphate Plant.

Materials received physically in short but insurance claim was not lodged for the value of the short receipts of the materials against Contract no. CT-34, CT-21 etc.[89]

Imported raw materials, after arrival of the ship in the Jetty, the quantity was taken after joint draft survey and then unloading started through conveyor belt. Differences were found in several years.

	Joint draft survey MT	Maintenance Department MT	Store Ledger MT
In 1982-83[90]			
Rock Sulphur	31,226.070	30,718.000	30,573.640
Rock Phosphate	1,17,397.753	1,14,218.000	1,15,048.000
In 1983-84[91]			
Rock Sulphur	20,580.11	27,669.000	28,208.736
Rock Phosphate	1,09,637.80	1,34,565.000	1,33,893.000

Such differences are recorded for consignment wise quantity, need to be reconciled in order to confirm accurate quantity available for consumption, and for the purpose of valuation in the accounts under review.

89. Triple Superphosphate Complex Ltd., "Audit Report 1980-81", (Chittagong), p.3.
90. Triple Superphosphate Complex Ltd., "Audit Report 1982-83", (Chittagong), p.1.
91. Triple Superphosphate Complex Ltd., "Audit Report 1983-84", (Chittagong), p.11.

There is reason to believe that there is considerable scope for reduction of cost if proper and accurate scale is used for the measurement of raw materials consumed and if appropriate measures are adopted to prevent leakage of materials imported.

There is evidence that imported materials are not properly protected and accounted for. These are suppprted by audit report as, since all measuring devices and scales give inaccurate reading and weight, consumption shown in the accounts and year end ledger balances about the quantity of raw materials appears to be inaccurate and so is the valuation thereof appearing in the accounts under review.[92,93,94]

In TSP Complex, Chittagong, in March 1983 loose TSP was physically verified by the management and 1,881.90 MT value about at Taka 1 (one) crore was found short in the inventory. Regarding the shortage of such huge quantity, auditor noted from the statement given by the Additional Chief Operation Manager (Production) that as all the measuring device and also the scale give inaccurate reading and weight regarding input of raw materials and consequent output of finished products, this shortage came up. This shortage was deducted from the production of the whole as per practice followed by the company.

In view of the fact stated by the Additional Chief Operation Manager (Production) and as value of input of materials was charged to cost of production, cost of production for the year was inaccurate.

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92. Triple Superphosphate Complex Limited, "Audit Report 1983-84", (Chittagong), p.11.
93. Triple Superphosphate Complex Limited, "Audit Report 1984-85", (Chittagong), p.7.
94. Triple Superphosphate Complex Limited, "Audit Report 1985-86", (Chittagong), p.6.

Further, standard process loss was not determined and actual loss was not considered which the corporation suggested in the Incentive Bonus Scheme. Reportedly such inventory was taken in March 1983, the above quantity of shortage might have accumulated from April of 1982.[95]

It is apparent that there is substantial difference in material cost among the years. This is due to rate variance and usage variance. The year having more favourable purchase price and more efficient in the use of material can keep its material cost down compared to another year which is not as much careful in material purchase and in the effective use of the same.

The followings are the objectives of material management:

1. To avoid unnecessary build-up of stock.
2. To maintain smooth flow of supply of inputs.
3. To keep close watch on usage.
4. To make all concerned more input conscious.
5. To struggle for simplification and diversification.
6. To identify non-moving, slow-moving and fast-moving items.
7. To identify obsolate items for disposal.

A sound material control system for any factory should provide for.[96]

1. Coordination between budgets, requisitions purchasing, receiving, testing, storage, handling and disbursing.

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95. Triple Superphosphate Complex Limited, "Audit Report 1982-83", (Chittagong), p.4.

96. Schlatter, C.F. and Schlatter, W.J., Cost Accounting, (New York, 1960), p.207.

2. Centralised purchasing under the direction and authority of a qualified purchasing officer.

3. An internal check causing two or more persons to certify each document.

4. Proper use of storage of materials upon delivery.

5. A perpetual inventory revealing at all times the quantity and the value of each kind of material in stock.

6. A system of controlling accounts and subsidiary ledger showing materials purchased, issued, returned, spoiled or defective.

4.07.02 LABOUR COST

Society wants business firms to behave in socially desirable ways.[97] It has been termed that to a great extent productivity is dependent on the human factor.[98] Higher financial income as a means of increasing productivity can be provided to workers in different forms such as work on piece rate, granting of bonuses, permanent increase in the pay in the same position and increase in pay that accompanies promotion.[99] Health promotion should also be part of the corporation's strategy to affect the health care supply system.[100]

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97. Habibullah, M., "Balancing Organisational Goals", The Dhaka University Studies, Part-A, (Dhaka: 1977), p.146.

98. Hamid, Abdul, "Issues and Problems of Personnel Management", Management Development, (Dhaka: Bangladesh Management Development Centre, 1983), p.44.

99. Rahman, A.H.M. Habibur, "Financial Incentive as a Motivating Toll", The Dhaka University Studies,Part-A,(Dhaka: 1975), p.142.

100. Herzlinger, Regina E., and Calkins, David, "How Companies Tackle Health Care Costs : Part III", Harvard Business Review, (Massachusetts: 1985), p.80.

Modern Economists view health expenditure and educational expenditure are investment in human capital, because both are instrumental in raising productivity.[101]

Labour cost represents the human contribution to production and is an important cost requiring constant measurement, control and analysis. Therefore, it is essential to have effective control over labour costs. Effective labour cost control involves the coordinated efforts of the personnel department, payroll department, time and motion study department and the accounting department. Control over labour costs includes control over the activities of

(i) Recruitment, increments, and promotion;

(ii) Formulation of wage policy and incentive schemes and payment and accounting of wages; and

(iii) Proper allocation of labour costs.

The following information is needed for effective labour cost control:[102]

1. The time required for each basic operation in order to develop efficient methods.
2. The efficiency level of labour through the use of standards of comparison.
3. Productivity in relation to type of wage payment, with the best system of compensation for each kind of work as the objective.
4. The output of each employee.

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101. Habibullah, M., "Health Economics and Health Costs", The Dhaka University Studies, Part-C, (Dhaka: 1984), p.12.

102. Charles, T. Horngren, Cost Accounting : A Managerial Emphasis, Englewood Cliffs, New Jersey, p.424.

5. The amount of direct labour to be charged to each job, lot, process or department.

6. Total labour hours and cost in each department during a payroll period.

Several of the more common records utilised by an enterprise to collect much of the aforesaid data are listed below:[103]

1. Clock card
2. Time or job ticket
3. Daily time report
4. Payroll register
5. Employee earning record
6. Labour distribution register

An Indian academician Professor B.K. Basu[104] described the features of public enterprises and among them the strict control over the activities of the public enterprises alerted the personnels working in various key areas of the undertakings.

The salary structure has failed to maintain itself in view of the sky-rocketting inflation in the economy and the government has also failed to maintain the salary structures compared to private sector in the economy especially the multi-national corporations.[105]

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103. Clarence L. VanSickle, Cost Accounting, New York, 1948, p.244.

104. Basu, B.K., An Insight into Auditing, (Calcutta: Book Syndicate Private Limited, 1981), p.28.3.

105. Siddique, Abu Hossain, "Compression of Salary Structures of Higher Level Executives in Bangladesh", The Dhaka University Studies, Part-C, (Dhaka: 1985), p.115.

M.A. Satter, Minister-in-charge of Labour and Manpower, said that the government attached great importance to better employer-employee relationship for peace in the industrial area leading to increase in production for benefit of all concerned.[a] One of the most complex problems in the whole field of public enterprise management is the matter of formulating more effective personnel policies for the public sector.[106]

Fertilizer industry is a highly sophisticated, automated, and complicated chemical industry where safety problems are multifarious, the magnitude of some of which catastrophic and disastrous in character. Slight inattentiveness by any body may cause serious damage to plant, machinery and human beings. Moreover, most of the gases handled here are colourless, odourless and testeless and leakage of gases cannot be easily detected if it is not timely watched and detected by the variation in the process conditions.[107]

High cost of production is considered to be a serious problem in Bangladesh and training on cost reduction methods is often talked about. One can get clues to discover training needs in the area of cost cutting by review of existing research monographs and Directors, Reporters as well as Chairmans speech.[108]

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a. The Bangladesh Observer, Dhaka, 21st October, 1986 (The Minister was speaking on the occasion of signing an agreement between the management and labour union of Albert David Co. Ltd. in Dhaka).

106. Thomas, Philip S., (Member of the Academic Staff of the Indian Institute of Management, Ahmedabad), Personnel Policies in Public Enterprises, (Government of India, Ministry of Information and Broadcasting, 1979), p.101.

107. Rahman, Taibur (Mech. Engr. Urea Fertilizer Factory Limited, Ghorasal), "Safety Problems in Fertilizer Industry and their Optimum Solutions", Management Development, (Dhaka: Bangladesh Management Development Centre, 1973), p.16.

108. Habibullah, M., "Relevance of Triming and Its Investment-Worth", The Dhaka University Studies, Part-C, (Dhaka: University of Dhaka, Vol. VII, No. 2, December, 1986), p.33.

The enterprises underwent training courses in the field like Personnel Management, Financial Management, Stores Management, Marketing, Production, Maintenance, Work Study, Project Management, Labour Laws, Supervisory Training, Office Management, Welding, Vehicle Driving etc.[109] To create institutional training facilities for the personnel of fertilizer/chemical sector, a project plan at the cost of Tk.825.23 lacs, of which Tk.467.09 is of foreign currency is scheduled to be completed by December, 1989 at Urea Fertilizer Factory Limited, Ghorasal which will offer facilities for structured training for 260 new recruits per year for the existing and future fertilizer plants in the country, and programmes for development of skill of in-service personnel of fertilizer plant numbering 100 per year.[110] Adequate measures were taken to promote effective communication among the workers, staff and management for smooth operation of the factories. Seminars, workshop and orientation courses were frequently arranged to minimise the communication gap at all levels of enterprise management.[111]

The primary objective of employment policy of the corporation is to recruit people with appropriate educational qualification, background and experience to suit the demand of the job keeping the overall national policy in respect of employment in view.[112] Standing Selection Committees are now functioning with specific terms for

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109. Bangladesh Chemical Industries Corporation, "Annual Report 1980-81", Dhaka, p.14.

110. Urea Fertilizer Factory Limited, "Annual Report and Accounts 1985-86", (Ghorasal), p.19.

111. Bangladesh Chemical Industries Corporation, "Annual Report 1980-81", (Dhaka), p.14.

112. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", (Dhaka), p.17.

recommending personnel for recruitment, promotion, special promotion and special increments. New ACR forms with marking system were devised detailing the criteria for objective evaluation of the performance and quality of the officers and staff.[113]

The position of labour cost per ton of output of Urea, TSP and Ammonium Sulphate are shown in Table-4.14 which can also be presented by time series (Chart-4.07).

Table - 4.14

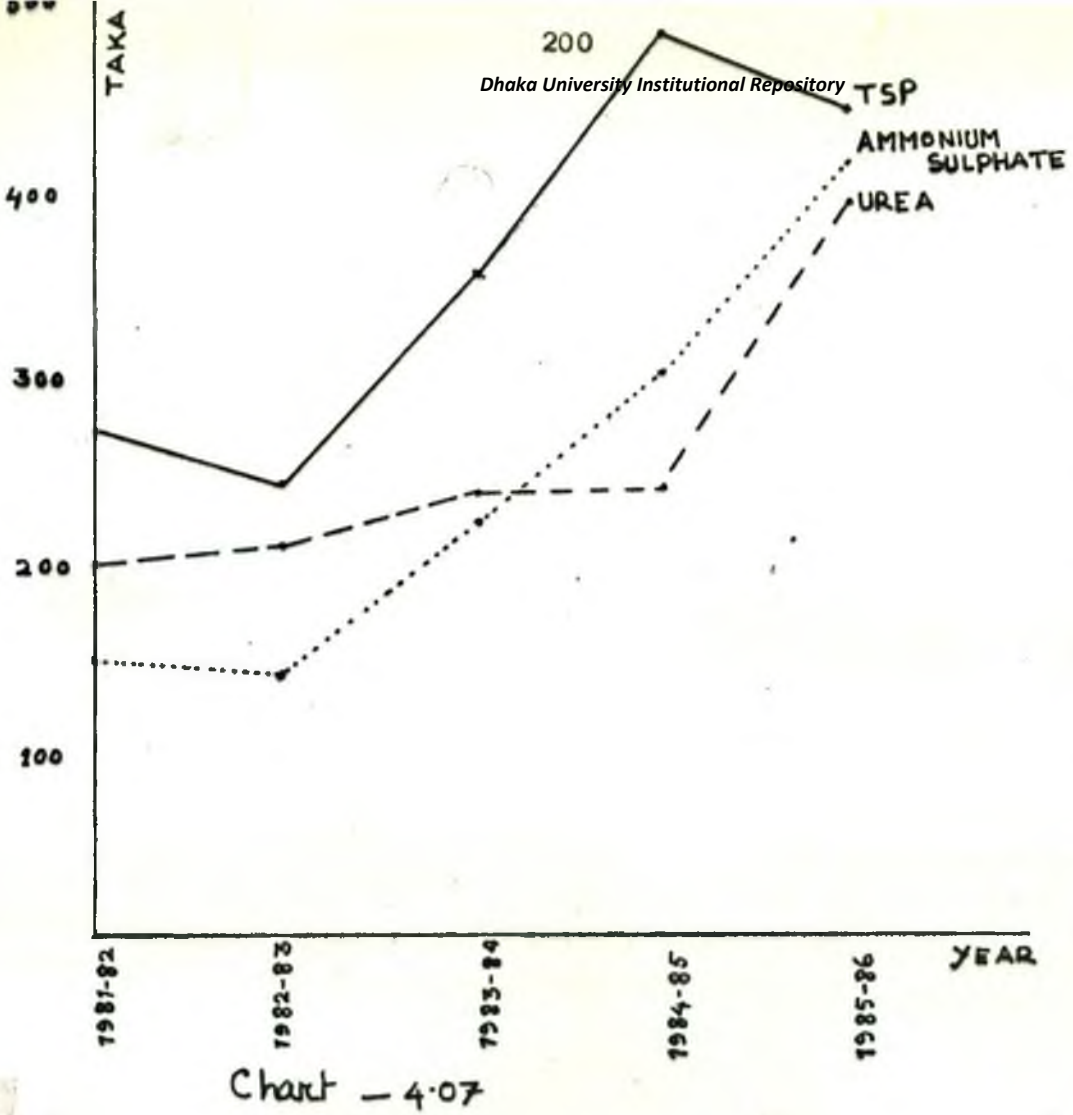
Labour Cost per MT

(Amount in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	299.20	317.42	463.43	452.92	833.33	473.26
UFFL	96.12	89.24	146.45	163.03	203.18	139.60
ZFCL	-	-	81.31	83.63	126.25	97.06
	197.66	203.33	230.40	233.19	387.59	239.64
B. TSP:						
TSPC	264.79	238.31	342.54	473.23	431.70	350.11
C. Ammonium Sulphate:						
NGFF	148.19	137.11	213.20	295.00	408.94	240.49

References: Prepared by the Researcher through Audit Reports.

113. Bangladesh Chemical Industries Corporation, "Annual Report 1983-84", (Dhaka), p.15.



Time Series showing Labour cost per metric ton of Urea, TSP and Ammonium Sulphat for the Last five years (1981-82 to 1985-86)

Chart – 4.07

Reference : Table-4.14

It appears that labour cost is increasing year to year. Labour cost per ton of Ammonium Sulphate in 1981-82 was Tk.148.19 and increased to Tk.408.94 in 1985-86. If we consider 1981-82 as base year then 1985-86 increased to 275.96%. In case of urea fertilizer labour cost per ton in 1983-84 was Tk.463.43, Tk.146.45 and Tk.81.31 for NGFF, UFFL and ZFCL respectively but in 1985-86 increased to Tk.833.33, Tk.203.18 and Tk.126.25 which means increased to 179.82%, 138.74% and 155.27%. Labour cost per ton of TSP in 1981-82 was Tk.264.79 and increased to Tk.431.70 in 1985-86 that is increased to 163.03%. In fine, we can say labour cost is increasing tremendously.

Same Pay Scales and Wage Scales are payable in all the fertilizer factories as per recommendation of the government's Pay and Wage Commission. Salary and Wages have been increased remarkably due to implementation of NNPS and MPS with effect from 1-6-1985 treated as fixed cost by the management.[114] Yet we observed substantial differences among the factories and from year to year in the same factory.

Apparently some years are more effective in the rational use of their manpower than other years. Per ton labour cost goes up and down with the variation in production volume since that salary and wage bill is allocated as fixed cost over available production volume. The variance is due to use variance. At times supervision becomes slack and workers adopt go-slow attitude. Wage cost is not variable cost now as no body can be laid down when production volume goes down. It is now a fixed cost and so per ton wage cost goes up or down with upping and dowining of production level.

During 1983-84, payment of excess amount to the associate Freedom Fighter's 2 (two) increment benefit, increased house rent, increased dearness allowances etc. For example, in the Natural Gas Fertilizer Factory Limited, payment of excess amount of Tk.100.00 lacs was made.[115]

There is scope of cost reduction by stoping irregularities. Some high irregularities were noticed in the Audit Report as, one employee granted 18 days earned leave and he was also instructed to

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114. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", Fenchugonj, p.9.

115. Natural Gas Fertilizer Factory Limited, "Annual Report 1983-84", (Fenchugonj), p.11.

refund 13 days salary as per sanctioned letter issued by Administration but such approval has no concurrence of the higher authority. In another case one employee draws 171 days salary as earned leave encashment.[116]

There is also scope of cost reduction by minimising overtime work. There is evidence that overtime is excessive as well as irregular and not properly authorised. This is apparent from the auditors report that overtime is continuous and in some cases the period of overtime is unusual.[117,118]

In view of the fact stated above, it is apparent that there is no effective system of internal control regarding overtime and the management should take steps to ensure effective control.[119]

R.A. Howell and S.R. Soucy argued that the automated equipment was intended to reduce labour cost and also contributes to the objectives of high quality, product reliability, fast and flexible manufacturing, and lower inventories.[120]

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116. Ibid., p.7.
117. Triple Superphosphate Complex Limited, "Audit Report 1982-83", (Chittagong), p.17.
118. Triple Superphosphate Complex Limited, "Audit Report 1984-85", (Chittagong), p.24.
119. Triple Superphosphate Complex Limited, "Audit Report 1982-83", (Chittagong), p.17.
120. Howell, Robert A., and Soucy, Stephen R., "Cost Accounting in the New Manufacturing Environment", Management Accounting, (N.J:, Montvale: National Association of Accountants, Vol. LXIX, No. 2, August, 1987), p.44.

4.07.03 POWER AND FUEL

If electricity is brought from some outside authority, the total charges for the power consumed can be easily ascertained. But many concerns have their own generating stations; and if steam is used, there will be a boiler house. The amount to be included in factory overheads in such cases as "Power and Fuel" will comprise materials used, wages of working in the power house and other expenses direct to it, and an equitable share of other overheads such as for general factory administration, store etc. In short, the power house should be treated as a separate department and the cost of running it compiled as such; the cost should be included in total factory overheads and apportioned to production departments according to the horse power of machinery installed.

Factory-wise position of power and fuel cost is shown in Table-4.15 which may also be graphically represented (chart-4.08). (Page 238)

Table - 4.15

Power & Fuel Cost per MT

(Amount in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1984-86	Average
A. Urea:						
NGFF	-	-	64.91	67.54	126.32	51.75
UFFL	189.19	115.12	129.69	90.42	175.09	139.90
ZFCL	-	-	7.08	4.82	2.62	4.84
	94.60	57.56	67.23	54.26	101.34	65.50
B. TSP:						
TSPC	227.77	263.98	484.48	419.50	380.38	355.22
C. Ammonium Sulphate:						
NGFF	19.45	18.16	25.03	64.56	40.68	33.57

Reference: Prepared by the Researcher through Audit Reports.

Effective control of power and fuel cost depends upon supervisory competence. This varies from year to year and factory to factory. Some years are more cost-minded and take care to ensure that electricity is not wasted and log books are properly maintained. Others are callous and one may find fans running on even when not needed.

Un-interrupted power supply should be ensured to avoid financial loss for wastage of raw materials and low production capacity utilisation.

Enhancement of duty on electricity involved an increased cost, for example Tk.48.51 lacs in 1983-84 for Natural Gas Fertilizer Factory Limited. Rate of duty on electricity had been increased from Tk.0.01 to Tk.0.05 per KWh from 1983-84, otherwise the cost would have been reduced more.[121]

In 1985-86, during their verification, the auditor observed that vehicle no. Ta 601, Kha 1156, Kha 3349 and Kha 2870 were unserviceable and in a damaged condition. Management should take steps to dispose of those vehicles to realise the fund. There are some other vehicles whose repairing and fuel consumption charges are so high that there is no justification of maintaining those vehicles for the use of the company.[122]

Measures were also taken to reduce cost of production by using sweep oil & lubricants by utilising own manpower for fabrication of vessels/equipment in the factory workshop.[123]

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121. Natural Gas Fertilizer Factory Limited, "Annual Report 1983-84", (Fenchugonj), pp.9-11.

122. TSP Complex Ltd., "Audit Report 1985-86", N.P., C., p.3.

123. Bangladesh Chemical Industries Corporation, "Annual Report 1982-83", (Dhaka), p.19.

4.07.04 STORES, SPARES AND ACCESSORIES

It appears that stores, spares and accessories consumed for the last five years at average rate of 5.58%, 4.63% and 3.61% of Ammonium Sulphate, Urea and TSP respectively of total production cost. The stores, spares and accessories cost involved in the factory for smooth running the production operation may be shown in Table-4.16 which may also be represented by Time Series (Chart-4.09).

Table - 4.16

Stores, Spares & Accessories Cost per MT

(Amount in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	140.89	129.33	227.83	116.64	175.44	158.02
UFFL	165.05	134.41	99.87	100.29	114.18	122.76
ZFCL	-	-	68.17	44.28	96.95	69.80
	152.97	131.87	131.96	87.07	128.86	116.86
B. TSP:						
TSPC	380.10	258.70	204.45	192.27	136.39	234.39
C. Ammonium Sulphate:						
NGFF	298.20	127.18	114.63	119.47	160.63	164.02

Reference: Prepared by the Researcher through Audit Reports.

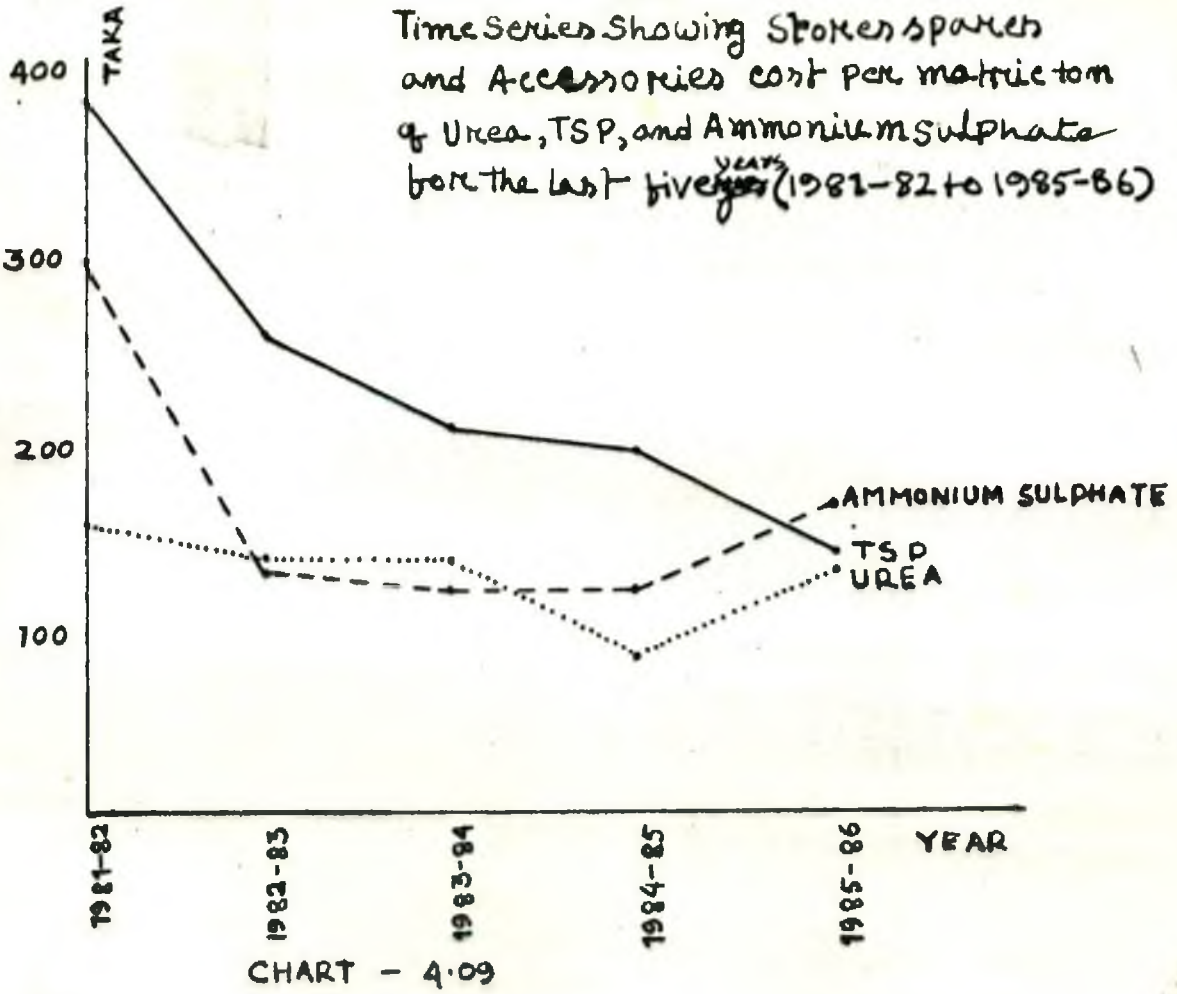

CHART - 4.09

Reference : Table-4.16

Stock of stores, spares and accessories have been valued at weighted average cost. The valuation policies are being consistently followed year to year.[124]

Inventory is a bridge which connects and co-ordinates the various activities of an organisation, such as production, maintenance and marketing etc. and the lubricant which ensures smooth functioning of these activities.

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124. Urea Fertilizer Factory Limited, "Annual Report and Accounts. 1985-86", (Ghorasal), p.30.

Bangladeshi researcher S.A. Bakar describes that inventories are important and multidimentional factors of production. He argued that not only the quantity of inventories was significant but also the maintenance of the optimum level of inventories was crucial for the smooth operation of production of goods at a possible minimum costs.[125]

There was high level of inventories for spares and accessories which were accumulated year to year for various reasons. The management took some positive steps to reduce inventory and a Material Planning & Inventory Control Department was organised. As a result of these measures, inventory of Tk.250.00 lacs has been reduced during 1982-83 and 1983-84 in TSP Complex Limited, Chittagong and the upward trend of the level of inventory has been controlled. Further steps are being taken to scale down the level of inventories.[126]

Though there is a purchase policy of BCIC in making procurement of machineries, equipments and stores, whether for utilisation and consumption in mills and factories or for construction works is to patronize Bangladeshi product to the utmost possible extent consistent with economy and efficiency.[127]

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125. Bakar, Shaikh Abu, "Inventory Management in Jute Mills under Khulna Zone in Bangladesh for the period from 1973-74 to 1981-82", (Rajshahi; Ph.D. Thesis, Department of Accounting, Rajshahi University, 1987), p.91.

126. Triple Superphosphate Complex Limited, "Annual Report 1983-84", (Chittagong), p.13.

127. Bangladesh Chemical Industries Corporation, Hand Book of Rules and Regulations, Dhaka, 1982, p.89.

The major goal of inventory control is to discover and maintain the optimum level of inventory in investment. Two limits must be imposed in controlling inventory levels, because there are danger points which management must avoid. The optimum inventory level is somewhere between the two danger points.

There is scope for reducing cost of materials by introducing an enforcing properly designed stores accounting. Stores, purchased and entered into the store room are not properly recorded. There is also irregularities in order and issue of stores. Maximum, Minimum and Re-ordering point are not systematically and carefully followed for which there is anomally in the procurement of stores and also in their use. This is apparent from the audit reports from the different years. The audit firm reported like this. Inventory management is weak. ABC system is not in practice. Perpetual inventory system has been introduced but not systematically followed. As a result, valuable items obtained become obsolete the auditor report in this respect is also followed.

External Audit, M/S. Howlader Yanus & Co., Chartered Accountants, mentioned that maximum, minimum and re-ordering level have not been recorded in the cardex of Natural Gas Fertilizer Factory Limited, Fenchugonj.[128,129] As a result, the management is unable to ascertain whether any item is under or over stocked at any particular date. They strongly feel that proper system of maintaining stock should be introduced at an early date.

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128. Natural Gas Fertilizer Factory Limited, "Audit Report 1983-84", (Fenchugonj), p.6.

129. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", (Fenchugonj), p.15.

Some research works[130] have been done on inventory management. Everybody gave emphasis for the proper management of inventory. They are also in the opinion that there is a negative correlation between inventory management and cost of production. If inventories are properly managed, the cost of production of the concern will be reduced and vice versa.

The practice of modern techniques of inventory management will help establishing optimum level of inventory, which in turn, will reduce costs and increase profitability. One of the most crucial decisions management has to make concerns the control and management of inventories.[132] Public enterprises involve colossal purchases local and foreign. In this regard, there are allegations of corruption, influence and nepotism. Defective purchases are also alleged. It needs be seen why such allegations persist.[133]

130.(a) Bakar, Shaikh Abu, "Inventory Management in Jute Mills under Khulna Zone in Bangladesh for the period from 1973-74 to 1981-82", unpublished Ph.D. Thesis, (Rajshahi University, 1987).

(b) Shaha, A.C., "A Study of Some Problems of Working Capital Management in the Jute Mills of Dhaka Zone", unpublished Ph.D. Thesis, (Baroda M.S. University).

(c) Chowdhury, S.K., "Selective Inventory Control", The Management Accounting, Vol. IX, No. 6, June 1974.

(d) Alimullah, K., "Inventory Management in East Pakistan", Bureau of Economic Research, University of Dhaka, 1970.

131. Abdullah, A.S.M., "Inventory Management", The Bangladesh Accountant, The Institute of Chartered Accountants of Bangladesh, Vol.3, No.8, April-June 1980, Dhaka, p.41.

132. Ahmed, Hamid Uddin, "Inventory Management and Control", The Accountant, Bangladesh Chartered Accountancy Chatra Parishad, 3rd Issue, 1981, Dhaka, p.17.

133. Afzal, Md. Anwarul, "Diagnosis and Remedies : The Public Sector Sickness", The Bangladesh Observer, 8th February, 1987, Dhaka.

In TSP Complex, Chittagong, in course of audit of accounts of 1982-83, M/S. S.F. Ahmed & Co., Chartered Accountants, noted that in some cases, purchases were made without having relation to such requirements in the past. Unnecessary purchase of many items of stores and spares facilitated abnormal wastages and blocking of fund which had eo bear interest cost. On test check they noted the following valuable items only of group-17, which we lying in store without any movement for years together.

Code No.	Year of Origin	Amount (in taka)
17-03-049	1970	67,793
17-02-090	1975	51,584
17-07-428	1975	3,20,999
17-07-258	1975	7,33,720
17-06-252	1976	1,72,800
17-07-706	1976	2,33,072
17-02-164	1977	62,814
17-06-263	1977	52,122
17-03-411	1977	7,31,304
17-07-432	1978	6,92,074
17-08-537	1978	2,68,081
17-07-037	1978	2,77,022
17-02-086	1979	1,31,649

Contd.....

Code No.	Year of Origin	Amount (in taka)
17-02-087	1979	2,14,931
17-02-107	1979	40,483
17-02-120	1979	1,31,649
17-02-121	1979	2,14,931
17-03-050	1979	89,818
17-03-065	1979	70,915
17-03-261	1979	1,14,032
17-17-542 &543	1979	1,93,287
17-06-570	1979	1,81,950
17-06-574	1979	2,09,726
17-08-540	1979	5,28,161
17-06-031	1979	2,07,387
Total:		Tk. 59,92,304

To indicate element of interest on the fund blocked as a case study, taking 1978 as base year of purchases with a uniform rate of simple interest at 6% per annum which is less than usual rate, interest upto 30th June, 1983 amounts to Tk.21,57,229.40 on principal amount only. The corporation provides working capital charging compound interest and during 1982-83 interest was charged @ 7%.[134]

134. Triple Superphosphate Complex Limited, "Audit Report 1982-83", (Chittagong), p.3.

In, Natural Gas Fertilizer Factory Limited, the auditor mentioned that the list of slow moving stock and spares had not been prepared by the management.[135]

Huge quantity of slow moving unservicable materials involving a considerable amount are lying in the store as revealed in the inventory at the year end. These balances are being carried forward since long. As a result, unnecessary blockable of working capital for which the project management can circularise a list of such item to their sister concerns through corporation by which such items may get proper avenue for its proper utilisation and thus project can release some funds.[136]

The 'ABC' analysis is based on a principle known as "Pareto's Law". This is not a new concept, yet it has been often overlooked. In 1896 an Italian economist named Wilfredo Pareto stated , as a general principle, that "in any series of elements to be controlled, selected small fractions in terms of numbers of elements would always account for a large fraction in terms of effect".

This method is also known as always better control technique.

This is a principle of selective control. Different materials are grouped into three classes:[137]

(i) High priced material (A).
(ii) Medium priced material (B).
(iii) Low priced material (C).

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135. Natural Gas Fertilizer Factory Limited, "Audit Report 1983-84", (Fenchugonj), p.6.

136. Triple Superphosphate Complex Limited, "Audit Report 1985-86". (Chittagong), p.7.

137. Nigam, R.S., Narang, S.P., and Sehgal, B.C., Advanced Cost Accounting, (New Delhi: S. Chand & Co. Ltd., 1981), p.59.

In physical inventory, adjustment in respect of net shortage amounting to Tk.30,115.00 (short Tk.2,09,141.00 - Excess Tk.1,79,026) for Natural Gas Fertilizer Factory Limited in 1985-86 has been made in accounts which required approval from the higher authorities concerned.[138]

In TSP Complex, on test physical verification on 24th and 25th August, 1983, noted the following differences:[139]

Code No.	Item	Unit as per Kardex	Unit as per physical	Differences
8-12-138	S.S. Bolt & Nuts	676	656	(20)
14-08-094 &096	Oil tube & Pyroxe Glass	74	73	(1)

Auditor feels that reasons of differences should be ascertained, and full reconciliation between stores ledger and financial ledger should be prepared and it appears that there was lack of effective system of internal control regarding store accounting which should be improved.

In TSP Complex, Chittagong, both excess and short stores and spares were found and the value of short was debited to "Store Adjustment Account" and the value of excess was credited to the same account and the resultant net shortage together with that of previous year was charged to the Income Statement of 1982-83 as shown below:[140]

138. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", (Fenchuganj), p.15.

139. Triple Superphosphate Complex Limited, "Audit Report 1982-83", (Chittagong), p.2.

140. Ibid., p.2.

Break-up of Stores Adjustment Account

			Taka
Excess as per 1981-82 inventory report		...	9,51,324.74
Deduct :	Shortage as per 1981-82 inventory report.	...	9,20,710.74
			30,614.00
Add :	Excess as per 1982-83 inventory report.	...	19,56,483.40
			19,87,097.40
Deduct :	Shortage as per 1982-83 inventory report.	...	15,93,607.34
	Difference between store ledger and financial ledger.	...	30,56,820.58
			46,50,427.92
	Net Value of shortage	...	26,63,330.52

It is observed that Tk.1,44,328.00 of usable stores issued to staff and workers of the plant and others on loan basis upto 30-6-86 for Natural Gas Fertilizer Factory Limited but their adjustment or steps for receiving them back is not satisfactory and the auditor feel that the management should take necessary steps to this regard.[141]

Stores in-transit Tk.1,68,62,023.00, represent the estimated value of stores materials received and MRR have been issued there against but correct pricing of such materials could not be made for want of detailed particulars to be furnished by BCIC Head Office.

141. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", (Fenchugonj), p.24.

Maximum portion of such materials were Sulpher which had already been issued for consumption at such estimated price. Thus, there is every possibility of understatement of facts relating to stores which have already been consumed. Included in the said amount there are some balances which are being carried forward since long and needs immediate adjustments. Auditors feel that the management should pursue the concern department of Head Office to adjust the same.[142]

A good stock control system can reduce cost, generate additional capital and improve return on investment. Unnecessary build-up of inventory is avoided as far as practicable and all required material resources are made available in time and properly utilised. With this end in view, the BCIC prepared 'Store Control Manual' based on modern concept of material management . . . . . to provide necessary tools and guidelines for planning materials and controlling inventories effectively.[143]

For better internal control, "Perpetual Inventory System" i.e. contineous physical verification of items all the year round on test basis should be introduced immediately.[144]

In TSP Complex Limited, in course of their audit, they found considerable number of wrong casting, posting in the store Kardex, stock ledger and in their valuation.[145]

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142. Ibid., p.30.

143. Bangladesh Chemical Industries Corporation, Store Control Manual, Dhaka, 1987.

144. Triple Superphosphate Complex Limited, "Audit Report 1982-83", (Chittagong), p.3.

145. Triple Superphosphate Complex Limited, "Audit Report 1980-81", (Chittagong), p.3.

Urea Fertilizer Factory Limited, has just stepped into Computer age. Need and importance of computer in inventory management, acceelerated computerisation of store accounting system of UFFL with the introduction of Bresler's codification of stores which started in October, 1982. This is no doubt, a new chapter in the history of accounting of UFFL. Store accounting so far maintained manually in the factory has now been computerised with effect from July, 1986. On completion of computerisation of the stores accounting, there would be no requirement of maintenance of store ledger, SR Summary Register and MRR Summary Register. Accounting will be done much more accurately.[146]

One research in his study in jute industry in Bangladesh describes that there is a lack of cost consciousness regarding inventory among the officers and staffs and that inefficient inventory planning and control resulted in huge losses of the enterprises.[147] He also argued that control of obsolescence, spoilage, carrying cost and maintaining the inventories in accordance with levels are of prime importance for profitable use of funds tied up in inventory.

The Controller of Accounts, Bangladesh Chemical Industries Corporation, in a meeting of Head of Accounts of BCIC Enterprises was held on 22nd and 23rd September, 1985 in Dhaka told that objections are also coming from the auditors for not taking the annual physical inventory of stores, spares, raw materials and finished

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146. Urea Fertilizer Factory Limited, "Annual Report and Accounts 1985-86", (Ghorasal), p.14.

147. Muqtader, A.N.M. Abdul, "Inventory Planning and Control in Jute Industry in Bangladesh", Unpublished Ph.D. Thesis, University of Chittagong, Chittagong, 1987, p.338.

goods. To avoid audit objection, physical inventory of all stores, spares and accessories is a must. He further stated that inventory of stores are gradually increasing in many of the enterprises and it is blocking scarce fund which needs to be controlled. The stores in transit register is not also properly maintained in some enterprises. He suggested for proper maintenance of such register and timely adjustment thereof.

Finished Urea were theft from the godown of the factory which occurs often and frequently and in November 1987 in the Urea Fertilizer Factory, Ghorasal 1,750 bags of Urea were theft without any trace.[148]

4.07.05 FACTORY OVERHEAD COST

Factory overhead cost is the aggregate of factory indirect materials, indirect labour and indirect expense incurred inside a factory and for the benefit of manufacture.

Austerity measures are being exercised to contain unproductive overhead expenditure reduced to the minimum.[149]

Factory wise position of factory overhead cost are shown in Table 4.17 which may also be represented by Time Series (Chart-4.10).

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148. The Daily Ingilab, 11th June, 1988, Dhaka.

149. Bangladesh Chemical Industries Corporation, "Annual Report 1984-85", (Dhaka), p.13.

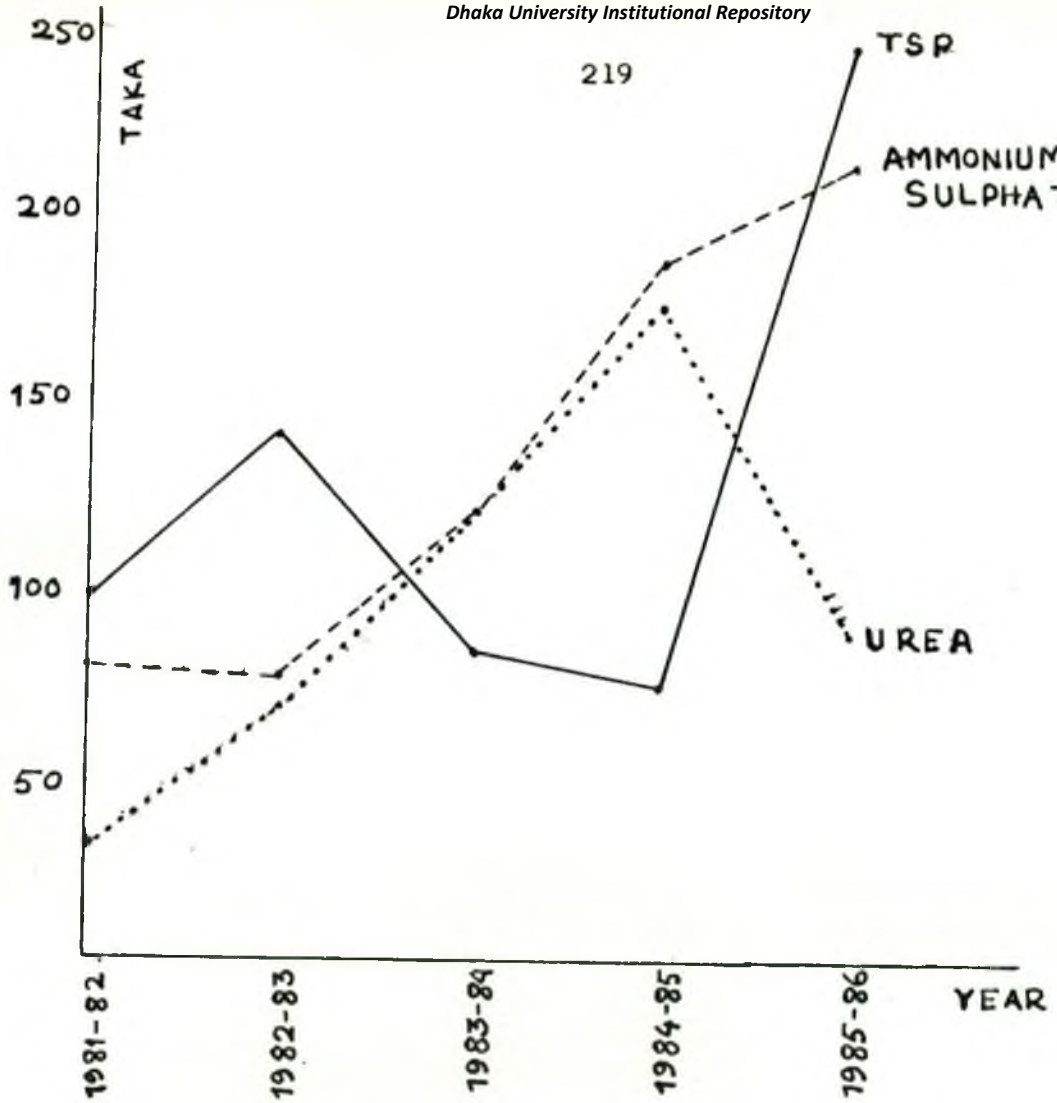
Table - 4.17

Factory Overhead Cost per MT

(Amount in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	32.62	34.58	88.16	122.88	155.05	86.66
UFFL	32.58	103.93	143.08	199.03	8.39	97.40
ZFCL	-	-	123.67	191.57	103.01	139.42
	32.60	69.26	118.30	171.16	88.82	107.83
B. TSP:						
TSPC	96.27	139.94	81.32	73.96	240.14	126.32
C. Ammonium Sulphate:						
NGFF	79.29	75.39	118.26	183.52	207.42	132.78

Reference: Prepared by the researcher through Audit Reports.



Time Series Showing Factory overhead Cost per metric ton of Urea, TSP and Ammonium Sulphate for the last five years (1981-82 to 1985-86)

CHART - 4.10

Reference : Table - 4.17

The factory overhead cost was netted by the sale proceeds of scrap & waste as per Head Office instruction noted in Memo No. BCIC/ Acct./812 dated 2.6.1984 as for example of TSP Complex Limited factory overhead cost was Tk.39,46,813.94 and the amount was netted by Tk.89,604.92.[150]

The external Auditor,M/S. Howlader Yunus & Co., Chartered Accountants, in course of their visiting the Natural Gas Fertilizer Factory Limited, for the year 1985-86, in factory site they have noticed that huge quantity of scraps like rejected pipes, machinery spares, heavy boiler tank etc. are lying at the factory site in the open yard. Most

150. Triple Superphosphate Complex Limited, "Audit Report 1983-84", (Chittagong), p.28.

of them are being rusted gradually. They strongly feel that all such scraps have fair market value and management may dispose off the same for realising value. They have also noticed that a huge quantity of Empty Drums of standard sizes are lying scattered on the different places of the factory. Drums are usually purchased with chemicals required for production. Chemicals after being consumed, drums become scrap for which proper records are not being maintained and suggest that a separate records should be maintained for such empty drums and steps should be taken to dispose off these drums at a regular interval instead of keeping them piled up or scattered here and there in the factory premises.[151]

R.A. Howell and S.R. Soucy argues that the shift from labour to equipment charges both the proportion and characteristics of the manufacturing costs refects as labour decreases and overhead increases.[152]

4.07.06 ADMINISTRATIVE OVERHEAD COST

Administrative overhead refers to the cost of formulating the policy, directing the organisation and controlling the operations of an undertaking.

The position of administrative overhead cost are shown in Table-4.18 which may also be represented by Time Series (Chart-4.11).

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151. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", (Fenchugonj), p.2.

152. Howell, Robert A, and Soucy, Stephen R., "Cost Accounting in the New Manufacturing Environment", Management Accounting, (NJ; Montvale: National Association of Accountants, Vol.LXIX, No.2, August 1987), p.44.

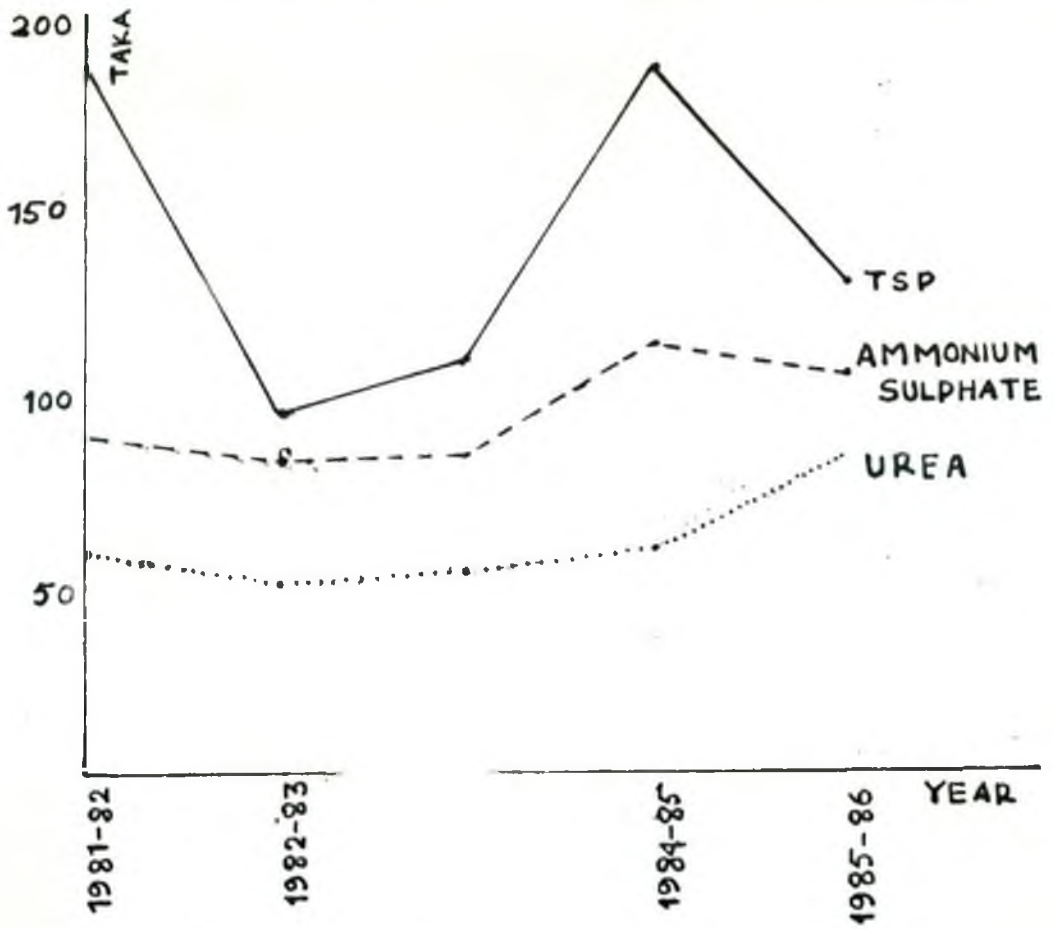
Table - 4.18

Administrative Overhead Cost

(Cost per MT in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	84.04	80.13	96.12	102.91	123.03	97.25
UFFL	26.89	19.46	27.53	36.11	65.92	35.18
ZFCL	-	-	29.68	27.60	51.14	36.14
	55.47	49.80	51.11	55.54	80.03	56.19
B. TSP:						
TSPC	186.81	93.44	106.11	186.33	129.15	140.37
C. Ammonium Sulphate:						
NGFF	86.72	80.52	80.80	112.42	101.26	92.35

Reference: Prepared by the researcher through Audit Reports.



Time Series Showing Administrative Overhead cost per metric tonne of Urea, Tsp and Ammonium Sulphate for the last five years (1981-82 to 1985-86)

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Refererree : Tabl-4.18

Cost of running the administration has increased. In recent times, office have become overstaffed and incidental expenses have increased unhindered. People have not been trained to become cost minded.

In TSP Complex Limited, administrative overhead for 1983-84 was Tk.86,20,914.98. As per resolution of the company's Board of Directors meeting, Tk.1,50,000.000 of advance to Ex-Employees and Tk.16,704.91 of stores in transit were provided for.[153]

Public undertakings usually suffers from over-staffing. As a result, the overhead or fixed expenses are disproportionate to the value of the output.[154]

Much attention has been given in recent years to a series of essays in book form, Parkinson's Law by Professor C. Northcote Parkinson. The theme of the book is that work tends to fill up the allotted time of all people doing it. E.V. Grills emphasised, in his book on techniques for the control of the work of an office organization and have presented techniques for improving the effectiveness of office operations, reducing costs and eliminating any unnecessary operations.[155]

Proper inspection not only maintains a good quality of the product but also it helps to out down the cost of the manufacture of the product.[156]

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153. Triple Superphosphate Complex Limited, "Audit Report 1983-84", (Chittagong), p.28.

154. Afzal, Md. Anwarul, "Diagnosis and Remedies : The Public Sector Sickness", The Bangladesh Observer, (Dhaka), 8th February, 1987.

155. Grillo, Elmer V., Control Techniques for Office Efficiency, (New York: McGraw-Hill Book Company, 1963), p.56.

156. Mallik, Enayet H., "The Need Function of Inspection in Industry", Management Development, (Dhaka: Bangladesh Management Development Centre, 1972), p.30.

It requires the control of clerical cost and the clerical cost control programme is a supervisory tool for getting a fair day's work for a fair day's pay. The best we could devise for the measurement of clerical output which require control of clerical costs is obvious. It is just as necessary as the control of production costs. Clerical costs can be controlled on any routine, repetitive work.[157]

4.07.07 SELLING AND DISTRIBUTION COST

Selling and distribution costs are costs which are incurred, after the goods are in a saleable condition, to reach them into the hands of the customers and also to maintain and create demand for the product.

The measurement of marketing costs is very difficult because it is hard to allocate the costs of a sales person or a advertising campaign to a particular brand or customer.[158] Recently great attention has been made to the control of selling and distribution costs.

Cost control is more difficult in the field of marketing than in manufacturing because of the lack of repetitiveness and the lack of consistency in distribution operations.[159]

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157. Gorder, H.F. Van, "Clerical Cost Control", NACA Bulletin, (USA: National Association of Cost Accountants, 1947).

158. Bhattacharjee, Haripada, "Distribution Cost Accounting - Analysis and Measurement Techniques", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1986), p.32.

159. Kelly, E.W., "Marketing Needs Cost Control", The Controller, (The Controllers Institute of America, 1953), p.630.

The fertilizer factories are to produce fertilizer and the Bangladesh Agricultural Development Corporation (BADC) is entirely responsible for the marketing function.

In 1977 and early 1978 the Government of Bangladesh, Bangladesh Agricultural Development Corporation (BADC) Officers, and US Agency for International Development (USAID) held several meetings on methods improve the fertilizer marketing system. The purpose was to increase fertilizer use on an equitable basis throughout the Bangladesh. Consultant services are being provided by the International Fertilizer Development Center (IFDC) to assist BADC.[160]

However, factories are also spending some amount on this head. As per audited accounts of the Natural Gas Fertilizer Factory Limited for the year 1985-86, schedule of selling and distribution expenses are as:[161]

(Amount in Taka)

Heads of Account	Urea	Ammonium Sulphate
1. Loading Expenses	2,39,030.17	19,542.11
2. Stocking Expenses	1,74,933.61	19,825.26
3. Miscellaneous Expenses	12,502.10	-
4. Maint. of Loco Engine	4,96,791.33	-
Total :	9,23,257.21	39,367.37

160. International Fertilizer Development Center, The Evaluation of the Bangladesh New Marketing System", Alabama, 1982, p.9.

161. Natural Gas Fertilizer Factory Limited, "Audited Accounts 1985-86", (Fenchugonj), p.19.

It appears from the above figures that there is no uniformity in the changing pattern of the said cost.

There is evidence that a good many companies have effected substantial savings and have enhanced their profits considerably as a result of concerted efforts to direct distribution activities in the most appropriate channels and to carry them out with maximum efficiency.[162]

A leading management academician and corporate executive of India argues that since a major proportion of the total expenses of a company is incurred for its marketing operations, it is important that the marketing executives keep all their expenses under continuous watch. He also pointed out that there are some useful principles and techniques of cost control and cost reduction which would stand them in good stead in their efforts in minimising the marketing costs and expenses.[163]

4.07.08 INSURANCE COST

Insurance on fixed asset is a fixed cost and that on stock is variable cost but coverage is taken for definite period during which volume of stock may change. Hence, there is economy of scale of operation, if operated below attainable level, insurance costs gets distributed over smaller output and as a result per ton insurance costs gets higher.

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162. Beckett, John A., "The Art and the Science of Distribution Costing", NACA Bulletin, (USA: National Association of Cost Accountants, 1951), p.614.

163. Chatterjee, B.K., Marketing Management, (Bombay: Jaico Publishing House, 1982), p.413.

The position of insurance cost are shown in Table-4.20 which may also be represented by Time Series (Chart-4.13).

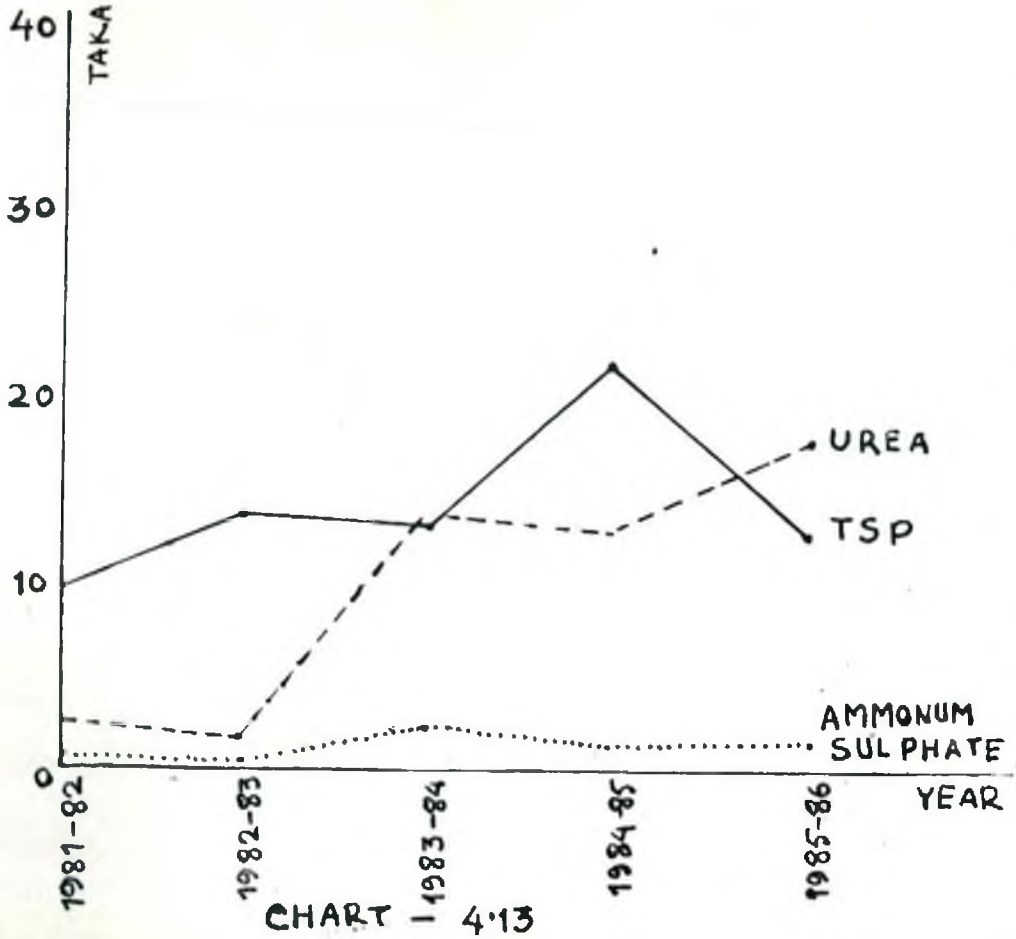
Table - 4.20

Insurance Cost

(Cost per MT in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1984-86	Average
A. Urea:						
NGFF	5.29	3.88	3.13	3.65	3.87	3.96
UFFL	-	-	3.73	2.36	3.74	1.97
ZFCL	-	-	32.70	31.31	44.18	36.06
	2.65	1.94	13.19	12.44	17.26	14.00
B. TSP:						
TSPC	9.69	13.28	12.85	21.29	12.13	13.85
C. Ammonium Sulphate:						
NGFF	0.35	0.33	2.18	1.14	1.70	1.14

Reference: Prepared by the researcher through Audit Reports.



Time Series Showing insurance cost per metric ton of Urea TSP and Ammonium Sulphate for the last five years (1981-82 to 1985-86)

CHART - 4.13

Reference : Table - 4.20

4.07.09 DEPRECIATION COST

Depreciation accounting is full of complexity, both at the level of theory and at the level of practice.[164]

In Bangladesh, different industries follow different methods of charging depreciation according to their own choice and this inconsistency makes the comparability of financial statement difficult. For instance all the Mills under Bangladesh Textile Mills Corporation and Albert David (Bangladesh) Limited, follow reducing balance method of charging depreciation. But at the same time all the Mills under Bangladesh Jute Mills Corporation use straight line method of charging depreciation, the Bangladesh Tobacco Company (BTC) uses reducing balance method and at the same time creates reserve to replace the fixed assets. The only organisation, the Philips (Bangladesh) Limited charges depreciation on the basis of replacement cost.[165]

It has been observed by the Bangladeshi academician that the charge of depreciation in Bangladesh Jute Mills Corporation is made on the basis of straight line method, rates for which are fixed differently for various assets.[166]

In the fertilizer factories, depreciation cost for fixed assets per MT are shown below (Table-4.21) which can also be represented by Time Series (Chart-4.14).

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164. Sen, Dilip Kumar, "Depreciation Accounting : Is it a Problem for Research in a Developing Country like Bangladesh?" The Accountant (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1986), p.34.

165. Salam, Md. Abdus, "Inflation-The Great Problem", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parisad, 1980), p.14.

166. Husain, Syed Masud, "An Analysis of the Depreciation Cost in Bangladesh Jute Mills Corporation", The Dhaka University Studies, Part-C, (Dhaka: 1985), p.29.

Table - 4.21

Depreciation Cost

(Cost per MT in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	418.61	399.39	322.09	382.95	728.57	450.32
NFFL	310.92	148.89	166.04	330.67	490.99	289.50
ZFCL	-	-	1,157.01	1,501.99	1,596.89	1,418.63
	364.77	274.14	548.38	738.54	938.82	719.48
B. TSP:						
TSPC	-	267.99	293.32	514.30	386.96	292.51
C. Ammonium Sulphate:						
NGFF	129.00	115.29	95.76	191.09	303.78	166.98

References: Prepared by the researcher through Audit Reports.

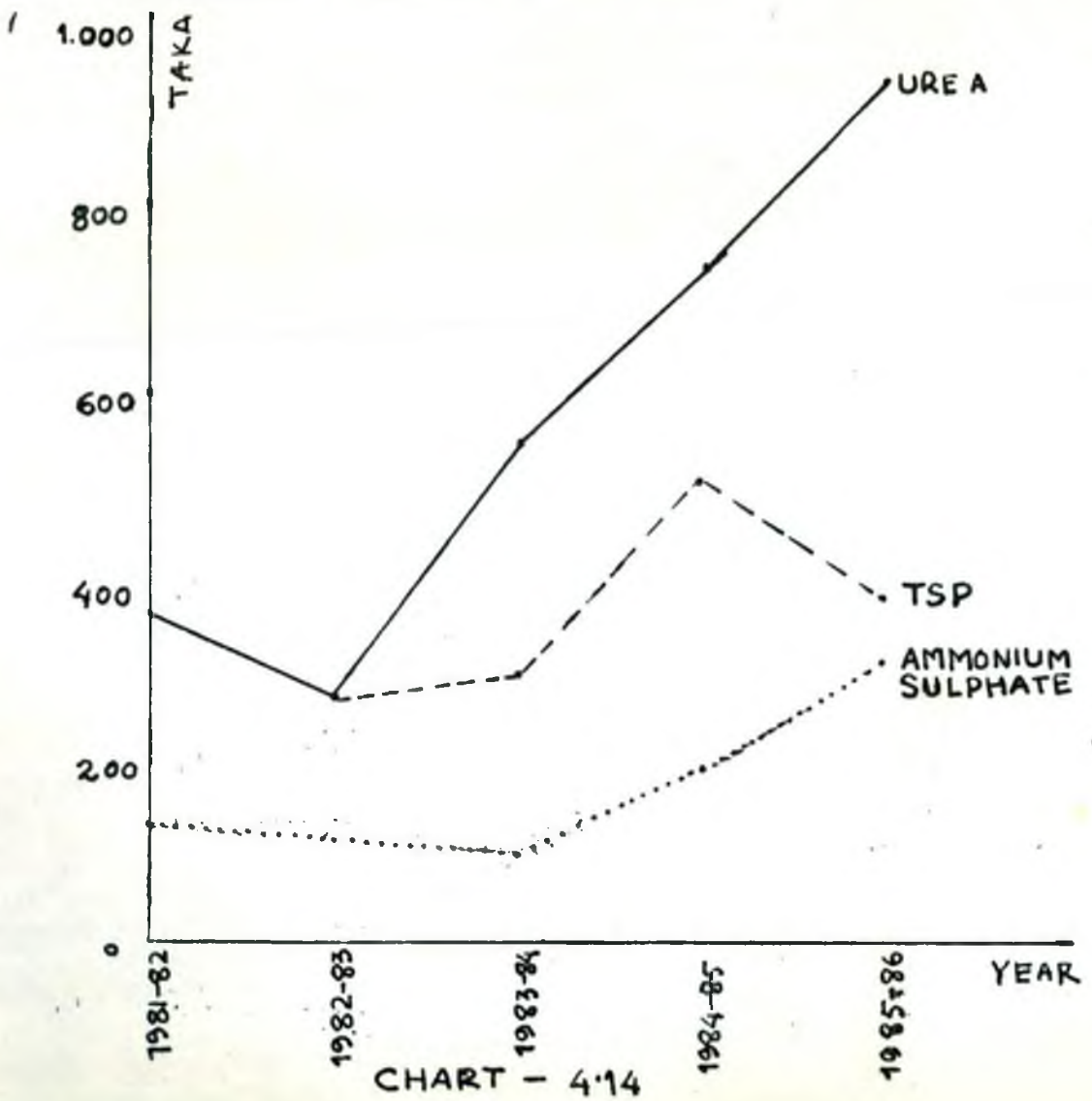

CHART - 4.14

Time Series showing Depreciation cost per metric ton of Urea, TSP, and Ammonium Sulphate for the last five years (1981-82 to 1985-86) [References: Table - 4.21]

All the enterprises of the Bangladesh Chemical Industries Corporation including fertilizer sector, depreciation is calculated on straight line method on various fixed assets. However, yearly rate of depreciation in respect of plant and machinery has been charged from 10% to 7½% as to maintain uniformity in the rate of depreciation with other fertilizer factories of BCIC as per policy of the authority vide their Memo no. BCIC/Acctts./BNL-901/118/59 dated 12.11.1985 with effect from the year 1985-86.[167]

Different factories mentioned their causes of increased depreciation as:

In UFFL, depreciation cost were Tk.766.31 lacs and Tk.1,505.83 lacs in 1984-85 and 1985-86 respectively. That is depreciation cost increased by Tk.739.52 lacs in 1985-86 and this increase were mainly due to:[168]

(i) Depreciation charge amounting to Tk.528.88 lacs on the capitalized amount due to exchange rate fluctuation of foreign currency as follows:

Capitalized for Yen credit	-	Tk.6,378.00 lac
Capitalized for IDA credit	-	Tk. 673.72 "
		Tk.7,051.52 "
Depreciation charged @ 7.5%	-	Tk. 528.88 "

(ii) Balance depreciation was charged on the capitalized assets of Rehabilitation Scheme, which was not charged in the previous year.

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167. Urea Fertilizer Factory Limited, "Annual Report and Accounts 1985-86", (Ghorasal), p.30.

168. Ibid., p.12.

In NGFF, auditors mentioned that due to devaluation of foreign currency the volume of depreciation on respective assets had also been increased remarkably.[169]

Let us have a look on the auditors opinions:

Although there is a fixed asset register, no entry has been recorded in the register since 1968. Physical inventory of fixed assets has not been conducted on 30th June 1977. The reasons for not conducting the physical inventory are not clear to us when an inventory officer has been appointed as early as in 1974 for this purpose. In the absence of fixed asset register and physical inventory it was not possible for us to verify the fixed assets. We feel that maintenance of fixed asset register and physical inventory is regarded as part of internal control and it should be insured that this is done in future.[170]

The company's old furniture are now being used by the officials of the factory at their residence without paying any rent for such use. There is neither any list of these furniture nor any office order recommending such use. The users of these furniture have refused to pay any rent for the use of these furniture on the grounds that most of the furniture are in damaged conditions. Fans are now being used by the officials of the factory at their residence also without paying any charge.[171]

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169. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", (Fenchugonj), p.13.

170. Natural Gas Fertilizer Factory Limited, "Audit Report 1976-77", Fenchugonj, Sylhet, p.3.

171. Natural Gas Fertilizer Factory Limited, "Audit Report 1983-84", Fenchugonj, Sylhet, p.6.

No physical inventory of fixed assets has been carried out by the management on 30th June, 1984.

In some cases identification marks were not available on the body of the fixed assets.

No register has been maintained for loose tools.[172]

No physical inventory of fixed assets had been carried out by the management as on 30th June, 1986. As such we could not ascertain whether the assets shown as per books were physically exist on that date.[173]

During the course of our audit we observed that the physical inventory of fixed assets was not carried out since inception of the project. We suggest a physical inventory of all countable fixed assets should immediately be carried out to trace out the losses and damages of assets, if any. Physical inventory of fixed assets should also be carried out at each year end and physical balances be reconciled with book balances.

We also suggest to maintain the fixed assets register including plant register upto date incorporating therein the adequate particulars which on compilation should agree with the figures in the schedules of fixed assets.[174]

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172. Natural Gas Fertilizer Factory Limited, "Audit Report 1983-84", Fenchugonj, Sylhet, p.26.

173. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", Fenchugonj, Sylhet, p.13.

174. TSP Complex Limited, "Audit Report 1980-81", North Potenga, Chittagong, p.11.

The company did not maintain any fixed assets register from the inception of the company nor were assets physically verified by the management at the year end except some furniture in the office and as such costs appearing in the accounts could not be linked up.

In our opinion, for the sake of interval control, complete physical inventory of the fixed assets should be taken at convenient invervals and a comprehensive Fixed Assets Register should be maintained with identification marks on relevant assets.[175]

We have been informed that Fixed Assets Registers of the company are not updated as the works of writing up the said registers are being made by M/S. Howlader Yunus & Co., Chartered Accountants.[176]

Depreciation is a fixed cost and therefore per MT depreciation cost gets lowered when capacity utilisation is enhanced and plants are operated in multiple shifts. As stated elsewhere, currently a big chunk of operable capacity is kept idle and attained efficiency of production level is much below the attainable level. Apparently, a useful way to reduce cost is to promote fixed asset use intensity which is low now.

Fixed Asset Register though is an important document for the management was not maintained systematically by the enterprises. The corporation took immediate steps and introduced fixed assets register in the enterprises from which the particulars of assets like original cost, addition, location and subsequent disposal, if any etc. could be seen at a glace now.[177]

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175. TSP Complex Limited, "Audit Report 1984-85", North Potenga, Chittagong, p.15.

176. TSP Complex Limited, "Audit Report 1985-86", North Potenga, Chittagong, p.2.

177. Bangladesh Chemical Industries Corporation, Ten Years of BCIC', (Dhaka), pp.22-23.

The management of machine, also called maintenance management, is a continuous and planned job.[178]

The Controller of Accounts of BCIC, said in a meeting of Head of Accounts of BCIC Enterprises held on 22nd and 23rd September, 1985 in Dhaka that objection raised by the auditors for not maintaining Plant Register and not carrying out physical inventory of Fixed Assets would definitely be viewed seriously by the government agencies. He suggested that the enterprises who had not yet updated the Plant Register and Fixed Assets Register should immediately arranged updating of the same which would also help in taking Annual Physical Inventory.

4.07.10 INTEREST AND FINANCIAL COST

Interest and financial cost per MT of Urea, TSP and Ammonium Sulphate are shown in Table-4.22 which may also be represented by Time Series (Chart-4.15).

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178. The Bangladesh Observer, "Maintenance Management, Editorial, (Dhaka), December 3, 1986.

Table - 4.22

Interest and Financial Charges

(Cost Per MT in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	67.12	332.03	321.03	388.20	687.40	359.16
UFFL	37.13	21.08	43.51	48.48	52.28	40.50
ZFCL	-	-	1,406.62	529.46	956.31	964.13
	52.13	176.56	590.39	322.05	565.33	454.60
B. TSP:						
TSPC	273.04	335.16	122.60	545.97	283.93	312.14
C. Ammonium Sulphate:						
NGFF	57.41	34.36	38.00	46.50	59.38	47.13

Reference: Prepared by the researcher through Audit Reports.

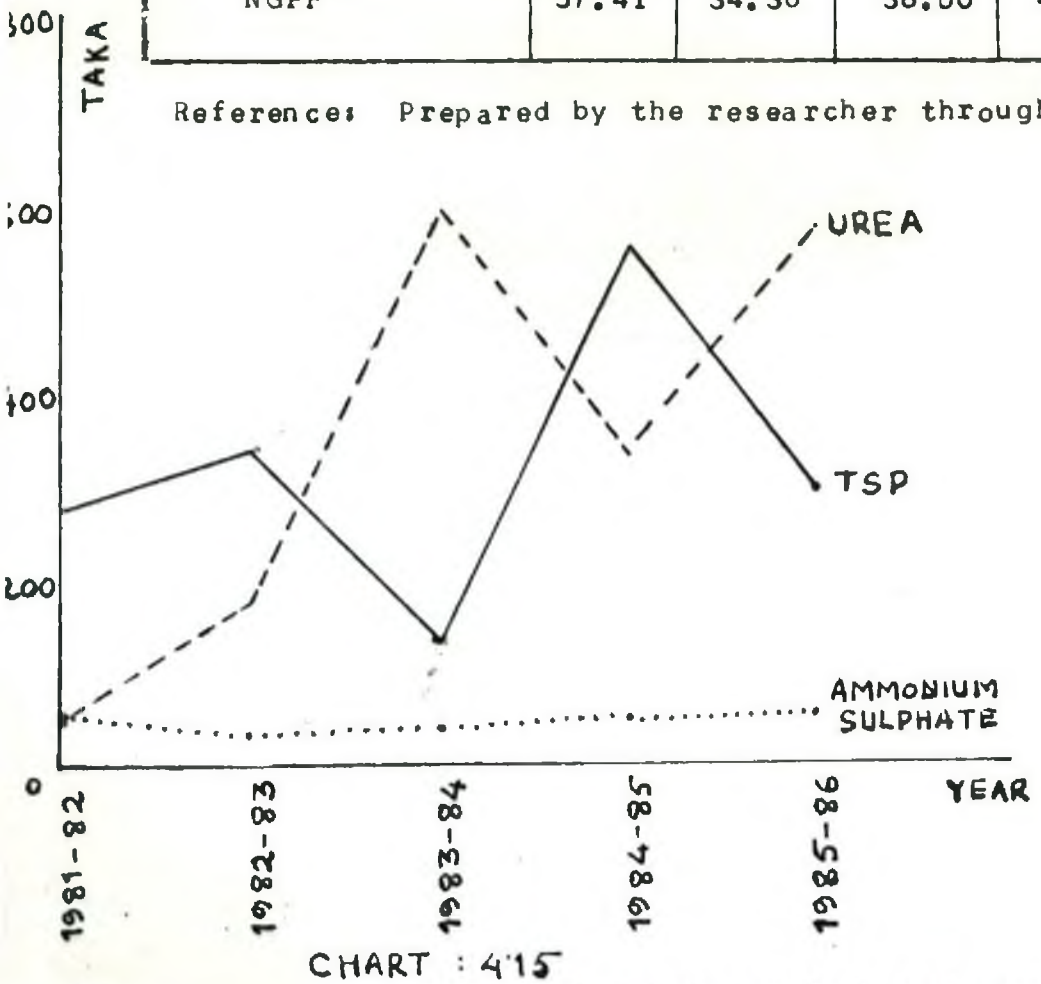

CHART : 4.15

Time Series Showing Interest and Financial cost per metric ton of Urea TSP. and Ammonium Sulphate for the last five years (1981-82 to 1985-86)

[Reference: Table - 4.22]

In the Bangladesh Chemical Industries Corporation, the ideal debt-equity ratio was totally absent, resultantly the unit had to bear extra-interest burden causing higher cost of production.[179]

Different factories mentioned their causes of increased interest and financial cost as:

During 1985-86, in Natural Gas Fertilizer Factory Limited, interest cost increased by about Tk.200.000 lacs over the budget estimates due to devaluation of foreign currency loan in the previous year.[180]

In Urea Fertilizer Factory Limited, interest expenses for the year 1984-85 and 1985-86 were Tk.113.98 lacs and Tk.160.35 lacs respectively, showing an increase of Tk.46.37 lacs. This increase was due to charging of interest @ 1% on capitalized amount of currency fluctuation loss on foreign currency giving consequential effect to foreign loan.[181]

During 1984-85, TSP Complex Ltd., Chittagong, paid Tk.7,79,296.00 as interest for non-payment of bill in time of Bakharabad Gas System Limited for installation of Gas line.[182]

As per government policy all sales are made to BADC and all sales proceeds are collected through BCIC and debited to BCIC Head Office Current Account and funds as and when required by the factory are realised from that account.[183]

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179. Bangladesh Chemical Industries Corporation, "Ten Years of BCIC", (Dhaka), p.23.
180. Natural Gas Fertilizer Factory Limited, "Audit Report 1985-86", (Fenchugonj), p.9.
181. Urea Fertilizer Factory Limited, "Annual Report and Accounts 1985-86", (Ghorasal), p.13.
182. Triple Superphosphate Complex Limited, "Audit Report 1984-85", (Chittagong), p.11.
183. Urea Fertilizer Factory Limited, "Annual Report and Accounts 1985-86", (Ghorasal, Narsingdi, p.3.

4.07.11 HEAD OFFICE OVERHEAD COST

The overhead which are charged by the Head Office to different enterprises are called Head Office overhead. It is charged by the Head Office to different enterprises according to their proportion which represents different cost of Head Office.

Like previous years, the BCIC Head Office will operate on no profit no loss basis i.e. whatever expenditure is required shall be levied on the enterprises. The total expenditure for 1986-87 is budgeted to increase by 2.3% from 1985-86 (revised) and is expected to be 0.88% of enterprises expenditure which is lower than 1985-86 and 1984-85.[184]

Head Office overhead cost charged are shown in Table-4.23 which may also be represented by Time Series (Chart-4.16).

Table-4.23

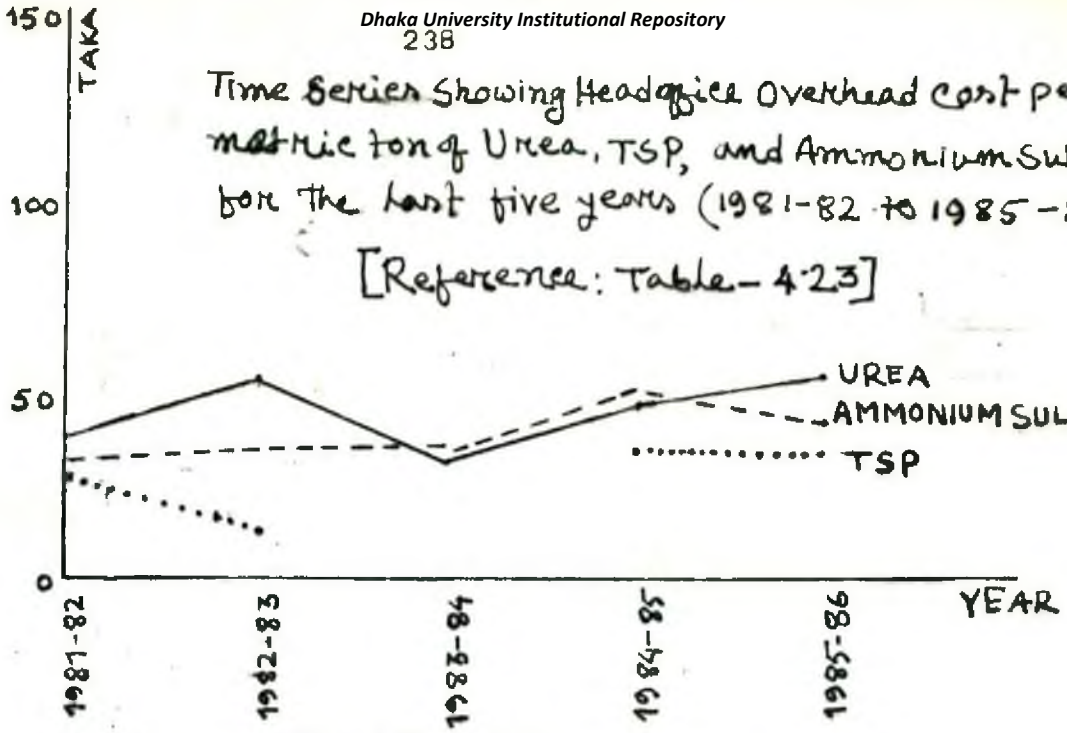
Head Office Overhead

(Cost Per MT in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	56.08	49.58	37.73	54.53	64.02	52.39
UFFL	33.65	52.65	40.14	48.08	36.81	42.27
ZFCL	-	-	11.76	36.16	56.41	34.77
	44.87	51.12	29.88	46.26	52.41	43.14
B. TSP:						
TSPC	25.12	12.86	-	34.75	32.52	21.05
C. Ammonium Sulphate:						
NGFF	35.79	37.29	37.63	49.93	42.98	40.72

Reference: Prepared by the researcher through Audit Reports.

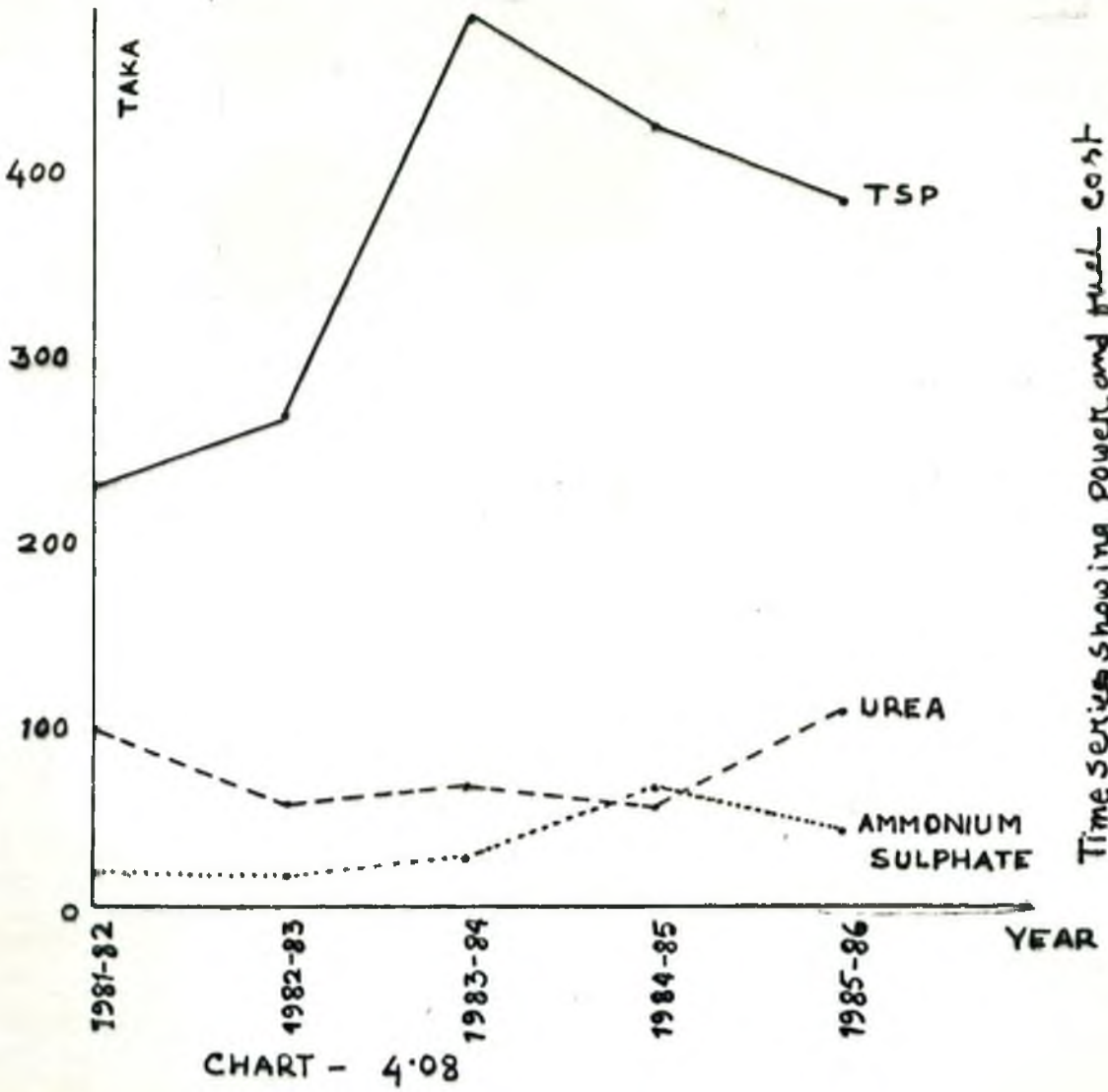
184. Government of the People's Republic of Bangladesh, Autonomous Bodies Budgets 1986-87, (Dhaka: Ministry of Finance, 1986), p.24.



Time Series Showing Headoffice Overhead cost per metric ton of Urea, TSP, and Ammonium Sulphat for the last five years (1981-82 to 1985-86).

[Reference: Table-4.23]

CHART : 4.16



Time series showing power and fuel cost per metric ton of Urea, TSP, Ammonium Sulphate for the last five years (1981-82 to 1985-86)

CHART - 4.08

Refekence : Table-4.15

CHAPTER - V

UFFL X-RAYED - A CASE STUDY

5.01 FERTILIZERS

It has been mentioned earlier that Bangladesh produces three kinds of fertilizers, viz.

(a) Urea,

(b) TSP, and

(c) Ammonium Sulphate.

Let us have a look into the different fertilizer factories, product wise.

A. Urea:

Urea fertilizer is produced by different fertilizer factories but our study is limited to:

1. Natural Gas Fertilizer Factory Limited,
2. Urea Fertilizer Factory Limited, and
3. Zia Fertilizer Company Limited.

Yearwise comparative production cost per MT for the different years are shown in Table-5.01

Table - 5.01

Statement showing the factory wise comparative production cost of Urea per MT for the last five years (1981-82 to 1985-86).

(in Taka)

Year	NGFF	UFFL	ZFCL
1981-82	2,307.73	1,809.37	-
1982-83	2,576.98	1,599.06	-
1983-84	2,636.58	1,759.45	3,689.84
1984-85	3,107.39	2,362.93	3,301.10
1985-86	4,354.94	2,201.18	4,071.36
Average	2,996.72	1,946.40	3,687.43

[Reference: Table-4.10]

From the above figures, it is apparent that Urea Fertilizer Factory Limited produced Urea at the lowest production cost. Though, Zia Fertilizer Company Limited was producing the highest quantity of Urea, but could not achieve the facilities of mass production. If UFFL can utilize full capacity, cost of production can be reduced to a greater extent.

B. TSP:

In Bangladesh, only one Triple Superphosphate Complex Limited is producing TSP fertilizer. Yearwise production costs per MT are shown in Table-5.02.

Table - 5.02

Statement showing yearwise production cost of TSP per MT for the last five years 1981-82 to 1985-86

Year	Cost Per MT in Taka
1981-82	6,292.32
1982-83	6,281.15
1983-84	6,203.27
1984-85	6,888.23
1985-86	7,396.91
Average	6,612.38

[References: Table-4.10]

The above data indicates that per ton cost for the first three years is decreasing and from 1984-85 cost is increasing. Causes of increasing cost are to be found out.

C. Ammonium Sulphate:

Ammonium Sulphate is produced only in the Natural Gas Fertilizer Factory Limited in Sylhet and hence there is no scope to compare with other factories. But it can be possible to compare yearly basis. Yearwise production costs per MT are shown in Table-5.03.

Table - 5.03

Statement showing the yearwise production cost of Ammonium Sulphate per MT for the last five years (1981-82 to 1985-86)

Year	Production Cost (Per MT in Taka)
1981-82	2,684.42
1982-83	2,647.70
1983-84	2,591.55
1984-85	3,170.13
1985-86	4,252.10
Average	3,069.18

[Reference: Table-4.10]

From the above data it is shown that for the first three years, costs were more or less constant with slightly decreasing trend but from 1984-85 production cost is increasing tremendously. Production cost for the year 1985-86 increased from the year 1984-85 by 34.13% per MT. Reasons have been described elsewhere.

5.02 PRODUCTION COST:

Production cost per MT in Taka* for the last five years (1981-82 to 1985-86) are shown in a single page for better understanding and to control cost (Table-5.04).

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* The national currency of Bangladesh.

Table - 5.04

Statement showing the factorywise production cost per MT for the last five years.

(1981-82 to 1985-86)

(Cost per MT in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Average
A. Urea:						
NGFF	2,307.73	2,576.98	2,636.58	3,107.39	4,354.94	2,996.72
UFFL	1,809.37	1,599.06	1,759.45	2,362.93	2,201.18	1,946.40
ZFCL	-	-	3,689.84	3,301.10	4,071.36	3,687.43
B. TSP:						
TSPC	6,292.32	6,281.15	6,203.27	6,888.23	7,396.91	6,612.38
C. Ammonium Sulphate:						
NGFF	2,684.42	2,647.70	2,591.55	3,170.13	4,252.10	3,069.18

[Source: Table-4.10]

Having determined the quantity to be produced, it becomes necessary to estimate cost of carrying out the production, plans and programmes. The yearly production cost were budgeted in accordance with the production target, considering the increase or decrease in the prices of production elements. Cost of production consists of materials, labour and overheads and therefore separate budgets for each are to be prepared. According to Matz & Usry[1] the production budget deals with the scheduling of operations, the determination of volume, and the establishment of maximum and minimum quantities of raw materials and finished goods

1. Matz, Adolph, and Usry, Milton F., Cost Accounting, Ohio: South-Western Publishing Co., 1982), p.481.

inventories which summarises, details and provides the basis for preparing the budgets of materials, labour and factory overhead. As per J.J. W. Neuner,[2] studying the actual and the budgeted production figures is one of the most important tasks of managerial control because, by analyzing the unfavourable variations and their causes, it will be possible to correct inefficient production cost and even reduce costs. However, in order to derive the optimum benefit from Budgetary Control, it is recommended that the production cost budget be analysed according to departments, budget centres, cost centres, or responsibility centres. Because in that case a person concerned can be held responsible if the expenditure exceeds the allowance prescribed and that, as a result, every item of cost becomes the responsibility of a person who can exercise control over it. Arora and Soni argued that the main values of management lies in control under the budgetary control system and it is possible only when budgeted cost are compared with the actual cost and efficiencies as well as inefficiencies variation in operation are pointed out.[3]

In this study the researcher has taken total production cost from the yearly audited Accounts for the last 5 (five) years i.e., 1981-82 to 1985-86 and these production costs were divided by the yearly production units which can give us per unit production cost.

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2. Neuner, John J.W., Cost Accounting, (Illinois: Richard D. Irwin, Inc., 1952), p.439.

3. Arora, S.P. and Soni, T.S., Cost Accounting, (New Delhi: Pitambar Publishing Company, 1983), p.4.25.

Discussion so far made relates to different aspects of cost data of four selected fertilizer factories of Bangladesh. The sum and substance of discussion is that out of the four factories one factory namely the Urea Fertilizer Factory Limited (UFFL) appears to the researcher is more significant as far as costs of production per metric ton (Table-5.01) are compared with others. Therefore, an indepth study on this factory (UFFL) is taken into consideration.

The researcher tries to study the UFFL from the multidimensional approach. Such as:

(a) Production cost,

(b) Cost per matric ton, and

(c) Comparison of budget and actual.

Let us have a look into the mentioned fertilizer factories in details.

a. Production Cost:

The yearly production cost for the Urea Fertilizer Factory Limited for the last five years are shown in Appendix-4.07 which can be presented below (Table-5.05).

Table - 5.05

Statement showing the actual total production cost for the last five years
(1981-82 to 1985-86)

Year	Production Cost (Amount in Lac Taka)
1981-82	4,575.23
1982-83	4,538.84
1983-84	4,524.68
1984-85	5,475.94
1985-86	6,750.81
Yearly Average	5,173.10

[Reference: Appendix-4.07]

b. Cost Per MT:

Cost per MT for the Urea Fertilizer Factory Limited for the last five years were calculated, yearly production cost divided by yearly production units. The position of cost per MT of Urea are as follows: (Table-5.06)

Table - 5.06

Urea Fertilizer Factory Limited
Ghorasal, Narsingdi

Statement showing total production, total cost and cost per MT for the last five years (1981-82 to 1985-86)

Year	Total Production MT	Total Cost (Taka in Lac)	Cost per MT (Taka)
1981-82	2,52,863	45,75.23	1,809.37
1982-83	2,83,844	45,38.84	1,599.06
1983-84	2,57,164	45,24.68	1,759.45
1984-85	2,31,744	54,75.94	2,362.93
1985-86	3,06,690	67,50.81	2,201.18
Average :	2,66,461	51,73.10	1,946.40

Source: Computed by the researcher as per Audit Reports.

c. Comparison of Budget and Actual:

The comparative statement (Table-5.07) can give us the clear idea of production performance of Urea Fertilizer Factory Limited in the form of production, production cost and cost per MT.

(i) Production: The production performance can be shown as follows:

Year	Budgeted MT	Actual MT	Variance MT
1981-82	2,50,000	2,52,863	2,863 (F)
1982-83	2,50,000	2,83,844	33,844 (F)
1983-84	2,65,000	2,57,164	7,836 (U)
1984-85	2,25,000	2,31,744	6,744 (F)
1985-86	3,00,000	3,06,690	6,690 (F)
Average	2,58,000	2,66,461	8,461 (F)

(ii) Production Cost: The position of production cost are as follows:

(Taka in Lac)

Year	Budget	Actual	Variance
1981-82	4,958.84	4,575.23	383.61 (F)
1982-83	5,048.04	4,538.84	509.20 (F)
1983-84	5,119.25	4,524.68	594.57 (F)
1984-85	5,956.59	5,475.94	480.65 (F)
1985-86	7,253.77	6,750.81	502.96 (F)
Yearly Average	5,667.30	5,173.10	494.20 (F)

(iii) Cost Per MT: The production cost per MT as budgeted and actual can be shown as follows:

Taka

Year	Budget	Actual	Variance
1981-82	1,983.54	1,809.37	174.17 (F)
1982-83	2,019.22	1,599.06	420.16 (F)
1983-84	1,931.79	1,759.45	172.34 (F)
1984-85	2,647.37	2,362.93	284.44 (F)
1985-86	2,417.92	2,201.18	216.74 (F)
Yearly Average	2,196.63	1,946.40	250.23 (F)

Table - 5.07

Urea Fertilizer Factory Limited
Ghorasal, Narsingdi

Comparative statement of budgets and actual for the five years
(1981-82 to 1985-86)

Year	Particulars	Total Production MT	Total Cost (Taka in lac)	Cost Per MT (Taka)
1981-82	Budgeted	2,50,000	4,958.84	1,983.54
	Actual	2,52,863	4,575.23	1,809.37
	Variance	2,863 F	383.61 F	174.17 F
1982-83	Budgeted	2,50,000	5,048.04	2,019.22
	Actual	2,83,844	4,538.84	1,599.06
	Variance	33,844 F	509.20 F	420.16 F
1983-84	Budgeted	2,65,000	5,119.25	1,931.79
	Actual	2,57,164	4,524.68	1,759.45
	Variance	7,836 U	594.57 F	172.34 F
1984-85	Budgeted	2,25,000	5,956.59	2,647.37
	Actual	2,31,744	5,475.94	2,362.93
	Variance	6,744 F	480.65 F	284.44 F
1985-86	Budgeted	3,00,000	7,253.77	2,417.92
	Actual	3,06,690	6,750.81	2,201.18
	Variance	6,690 F	502.96 F	216.74 F
Average (Yearly)	Budgeted	2,58,000	5,667.30	2,196.63
	Actual	2,66,461	5,173.10	1,946.40
	Variance	8,461 F	494.20 F	250.23 F

F = Favourable variance
U = Unfavourable variance

Source: Computed by the researcher as per Budgets and Audit Reports.

From the above table it is clear to us that the factory produced in all the years more than the production target except 1983-84, total production cost in all the five years was within the budgeted figures, and ultimately cost per metric ton for the last five years was below the budgeted cost which has favourable significance.

5.03 STATISTICAL TEST:

Statistics, being a study of quantitative phenomena, embraces almost all fields of social sciences. As such statistical methods may be developed to verify and test few items. Such as:

A. t-test : Co-efficient of correlation between the capacity utilization and the cost of production per metric ton.

B. Z-test : The percentage of cost under different heads are not in the same proportion in the selected fertilizer factories.

A. Cost is a function of capacity utilization. For each factory there exists a correlation between cost incurred in each year and its capacity utilization. For the factory UFFL there exists a correlation between cost incurred in each year with its capacity utilization. This may be examined by the following formula:

$$r = \frac{\Sigma (x - \bar{x}) \quad (y - \bar{y})}{\sqrt{\Sigma (x - \bar{x})^2 \quad \Sigma (y - \bar{y})^2}}$$

Where : r = Co-efficient of correlation.

x = Capacity utilization.

y = Production cost per metric ton.

$\bar{x}$ = The mean of capacity utilization.

$\bar{y}$ = The mean of production cost per metric ton.

Calculation of Co-efficient of Correlation

Year	x Capacity utilization %	y Cost per MT Tk.	$x - \bar{x}$	$y - \bar{y}$	$(x - \bar{x})^2$	$(y - \bar{y})^2$	$(x-\bar{x})(y-\bar{y})$
1981-82	74.37	1,809.37	- 4.00	-137.03	16.00	18777.22	548.12
1982-83	83.48	1,599.06	5.11	-347.34	26.1121	120645.07	-1774.9074
1983-84	75.64	1,759.45	- 2.73	-186.95	7.4529	34950.302	510.3735
1984-85	68.16	2,362.93	-10.21	416.53	104.2441	173497.24	-4252.7713
1985-86	90.20	2,201.18	11.83	254.78	139.9489	64912.848	3014.0474
Total :	391.85	9,731.99			293.758	412782.67	-1955.1378
Average:	78.37	1,946.40					

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

$$= \frac{-1955.1378}{\sqrt{293.758 \times 412782.67}}$$

$$= \frac{-1955.1378}{17.1394 \times 642.4816}$$

$$= \frac{-1955.1378}{11011.749}$$

$$= -0.1776$$

To conduct this test we are to make hypotheses:

i) There exists no correlation between capacity utilization and cost of production per metric ton. In Symbol $P = 0$.

ii) There exists correlation between capacity utilization and cost of production per metric ton. In Symbol $P \neq 0$.

For such cases t-test is to be applied by applying the formula:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$= \frac{(-.1776)\sqrt{5-2}}{\sqrt{1-(.1776)^2}}$$

$$\frac{(-.1776)\sqrt{3}}{\sqrt{1-.0315}}$$

$$= \frac{(-.1776) \times 1.7321}{\sqrt{.9685}}$$

$$= \frac{-0.3076}{.9841}$$

$$= -.3126$$

Since the calculated value of t is -.3126 that is negative correlation. Data provides evidence to accept the second (ii) hypothesis. There existed negative correlation between the capacity utilization and the cost of production per metric ton which meant when the capacity utilization increased, the cost of production per metric ton decreased and vice-versa.

From the above calculation, it may be noted that if capacity utilization of UFFL is increased by certain percentage, the cost of production per metric ton will come down accordingly and vice-versa, if other things remain the same. That is why the researcher holds the view that it is judicious to increase capacity utilization for controlling and reducing cost.

Production costs were classified into eleven categories shown in Chapter-IV, table-4.12 and the table indicates that the percentage of cost under different heads are not in same proportion. This can be statistically tested by Z-test. Here the researcher assumes that the percentage of cost incurred in different cost heads are not different in all the fertilizer factories. For testing the above let us have the following hypotheses:

$$H_o : P_1 = P_2$$

$$H_1 : P_1 \neq P_2$$

A. Comparison of cost percentage in NGFF and UFFL

Cost heads	NGFF P_1	UFFL P_2	$P = \frac{n_1P_1 + n_2P_2}{n_1 + n_2}$	$Z = \frac{P_1 - P_2}{P(1-p)\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$
Material Cost	.4318	.5088	$P = \frac{5(.4318) + 5(.5088)}{5+5}$ $= \frac{2.159 + 2.544}{10}$ $= \frac{4.703}{10}$ $= 0.4703$	$Z = \frac{.4318 - .5088}{.4703(1-.4703)\sqrt{\frac{1}{5} + \frac{1}{5}}}$ $= \frac{-.077}{.4703 \times .5297\sqrt{.2+.2}}$ $= \frac{-.077}{.2491\sqrt{.4}}$ $= \frac{-.077}{.2491 \times .6325}$ $= \frac{-.077}{.1576}$ $= -.4886$
Labour Cost	.1532	.0707	$P = \frac{5(.1532) + 5(.0707)}{5+5}$ $= \frac{.766 + .3535}{10}$ $= \frac{1.1195}{10}$ $= .1120$	$Z = \frac{.1532 - .0707}{.1120(1-.1120)\sqrt{\frac{1}{5} + \frac{1}{5}}}$ $= \frac{.0825}{.1120 \times .888\sqrt{.2 + .2}}$ $= \frac{.0825}{.0995\sqrt{.4}}$ $= \frac{.0825}{.0629}$ $= 1.3116$

Overheads (Others)	.4150	.4205	$P = \frac{5(.4150)+5(.4205)}{5+5}$ $= \frac{2.075 + 2.1025}{10}$ $= \frac{4.1775}{10}$ $= .4178$	$Z = \frac{.4150 - .4205}{.4178(1-.4178)\sqrt{\frac{1}{5}\ \frac{1}{5}}}$ $= \frac{-.0055}{.4178 \times .5822\sqrt{.2+.2}}$ $= \frac{-.0055}{.2432\sqrt{.4}}$ $= \frac{-.0055}{.2432 \times .6325}$ $= \frac{-.0055}{.1538}$ $= -.0358$

B. Comparison of Cost Percentage in UFFL and ZFCL

Cost heads	UFFL P_1	ZFCL P_2	$P = \frac{n_1P_1 + n_2P_2}{n_1 + n_2}$	$Z = \frac{P_1 - P_2}{P(1-p)\sqrt{\frac{1}{n_1}\ \frac{1}{n_2}}}$
Material Cost	.5088	.2396	$P = \frac{5(.5088)+3(.2396)}{5+3}$ $= \frac{2.544 + .7188}{8}$ $= \frac{3.2628}{8}$ $= .4079$	$Z = \frac{.5088 - .2396}{.4079(1-.4079)\sqrt{\frac{1}{5}\ \frac{1}{5}}}$ $= \frac{.2692}{.4079 \times .5921\sqrt{.2 + .3333}}$ $= \frac{.2692}{.2415.\sqrt{.5333}}$ $= \frac{.2692}{.2415 \times .7303}$ $= \frac{.2692}{.1764}$ $= 1.5261$

Labour Cost	.0707	.0261	$P = \frac{5(.0707)+3(.0261)}{5+3}$ $= \frac{.3535 + .0783}{8}$ $= \frac{.4318}{8}$ $= .0540$	$Z = \frac{.0707 - .0261}{.0540(1-.0540)\sqrt{\frac{1}{5}+\frac{1}{3}}}$ $= \frac{.0446}{.0540 \times .946\sqrt{.2 + .3333}}$ $= \frac{.0446}{.0511\sqrt{.5333}}$ $= \frac{.0446}{.0511 \times .7303}$ $= \frac{.0446}{.0373}$ $= 1.1957$
Over-heads (Others)	.4205	.7343	$P = \frac{5(.4205)+3(.7343)}{5+3}$ $= \frac{2.1025 + 2.2029}{8}$ $= \frac{4.3054}{8}$ $= .5382$	$Z = \frac{.4205 - .7343}{.5382(1-.5382)\sqrt{\frac{1}{5}+\frac{1}{3}}}$ $= \frac{-.3138}{.5382 \times .4618\sqrt{.2+.3333}}$ $= \frac{-.3138}{.2485\sqrt{.5333}}$ $= \frac{-.3138}{.2485 \times .7303}$ $= \frac{-.3138}{.1815}$ $= -1.7289$

C. Comparison of Cost Percent in NGFF and ZFCL

Cost heads	NGFF P_1	ZFCL P_2	$P = \frac{n_1P_1 + n_2P_2}{n_1 + n_2}$	$Z = \frac{P_1 - P_2}{P(1-p)\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$
Material Cost	.4318	.2396	$P = \frac{5(.4318)+3(.2396)}{5+3}$ $= \frac{2.159 + .7188}{8}$ $= \frac{2.8778}{8}$ $= .3597$	$Z = \frac{.4318 - .2396}{.3597(1-.3597)\sqrt{\frac{1}{5} + \frac{1}{5}}}$ $= \frac{.1922}{.3597 \times .6403\sqrt{.2+.3333}}$ $= \frac{.1922}{.2303\sqrt{.5333}}$ $= \frac{.1922}{.2303 \times .7303}$ $= \frac{.1922}{.1682}$ $= 1.1427$
Labour Cost	.1523	.0261	$P = \frac{5(.1532)+3(.0261)}{5+3}$ $= \frac{.766 + .0783}{8}$ $= \frac{.8443}{8}$ $= .1055$	$Z = \frac{.1532 - .0261}{.1055(1-.1055)\sqrt{\frac{1}{5} + \frac{1}{3}}}$ $= \frac{.1271}{.1055 \times .8945\sqrt{.2+.3333}}$ $= \frac{.1271}{.0944\sqrt{.5333}}$ $= \frac{.1271}{.0944 \times .7303}$ $= \frac{.1271}{.0689}$ $= 1.8447$

Over-heads (Others)	.4150	.7343	$P = \frac{5(.4150)+3(.7343)}{5+3}$ $= \frac{2.075 + 2.2029}{8}$ $= \frac{4.2779}{8}$ $= .5347$	$Z = \frac{.4150 - .7343}{.5347(1-.5347)\left(\frac{1}{5}+\frac{1}{3}\right)}$ $= \frac{-.3193}{.5347 \times .4653 \quad .2+.3333}$ $= \frac{-.3193}{.2488 \quad .5333}$ $= \frac{-.3193}{.2488 \times .7303}$ $= \frac{-.3193}{.1817}$ $= -1.7573$

Let us summarise the findings of the Z test in a tabular form (Table-5.08).

Table - 5.08

Tabulated Summary of Z-test

Factories	Cost heads	Results of Z test
A. NAFF and UFFL	Material Cost	.4886
	Labour Cost	1.3116
	Overheads	.0358
B. UFFL and ZFCL	Material Cost	1.5261
	Labour Cost	1.1957
	Overheads	1.7289
C. NGFF and ZFCL	Material Cost	1.1427
	Labour Cost	1.8447
	Overheads	1.7573

Source: Findings of the Z test.

The above table indicates that in each category of cost head in between/among the fertilizer factories there existed deviations or differences.

The researcher in fine, may conclude that there is dissimilarity in cost percentage of different heads of selected fertilizer factories. It would be better to follow the target of cost percentage of best performer for controlling and reducing cost.

CHAPTER - VI

DETERMINANTS OF PRODUCTION COST

An effort has been made to identify the factors which account for high production cost. The factors are described below:

5.01 PRODUCTION PERFORMANCE

Bangladesh it is reported,[1] has a poor productivity records and industrial base as compared to other least developing countries. For the development of a country nay the nation one important aspect is to have confident rather than comparison of its own position with that of others. This is evident from the remark that 'there is much room to improve the public sector enterprises performance in Bangladesh'.[2]

Internationally reputed management experts have rightly argued that a public enterprise is responsible to the public, consumers, public authority and foremost to itself, for it must meet its own high standards of performance, norms, and standards.[3] The performance of the public enterprise and its role are judged from a larger social angle instead of profit earning purpose.[4]

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1. Rahman, A.H.M. Habibur, "Towards Modernisation of Small-Scale Industries in Bangladesh", The Dhaka University Studies, Part-C, (Dhaka, 1985), p.105.
2. Moniruzzaman, Md., "Accountability of Public Enterprises in Bangladesh", Management Development, (Dhaka: Bangladesh Management Development Centre, 1981), p.118.
3. Tandon, P., "Control Systems and Accountability in the Public Enterprise", Fernandes, Praxy, (editor), Control Systems for Public Enterprises in Developing Countries, (Ljubljana: International Centre for Public Enterprises in Developing Countries, (ICPE), 1982), p.145.
4. Tandon, B.C., Management of Public Enterprises, (Allahabad: Chaitanya Publishing House, 1978), p.25.

Interregional Workshop, contains 7 (seven) resource papers and 16 (sixteen) country papers in collaboration with the UN Division of Public Administration and Finance, held at Ljubljana, Yugoslavia, 9 to 13 July, 1979 by International Centre for Public Enterprises in Developing Countries (ICPE). With the collaboration of the Commonwealth Secretariat, the ICPE organised a workshop on parliamentary controls at Colombo, Sri Lanka, in June 1981, which was followed by a workshop on government executive controls over public enterprises convened at New Delhi in January 1982. The efficacy of control systems is related to a clear understanding of the rationale and objectives of public enterprises and the designing of agreed parameters of performance evaluation.[5]

Bangladeshi experts have agreed that performance of an undertaking must be evaluated objectively not subjectively and public sector industries shall not be evaluated only on the basis of its profit earning capability — rather it must be evaluated basing on its performance in all key results areas (Key objectives).[6] A. Haque,[7] Financial Adviser, Bangladesh Steel and Engineering Corporation has concluded in his paper that in order to establish the case of the public sector on a sound footing, the developing countries must, therefore earnestly endeavour to improve their existing techniques of exercising control with the objective of improving the performance of their public sector.

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5. Fernandes, Praxy, (editor), Control Systems for Public Enterprises in Developing Countries, (Ljubljana: International Centre for Public Enterprises in Developing Countries, 1982).
6. Chowdhury, S.A., "Some thoughts on the prevailing industrial policy of Bangladesh", Management Development, (Dhaka: Bangladesh Management Development Centre, 1983), p.42.
7. Haque, Anwarul, "System of Internal and External Control of Public Sector Industrial Enterprises in Bangladesh", paper presented at an Inter-regional Workshop held at Ljubljana, Yugoslavia, 9 to 13 July, 1979.

Recognising the role of research in toning up the performance of public enterprises, the Institute of Public Enterprise, Hyderabad, conducted a National Seminar of senior research workers on public enterprise in March, 1982. Sarkar, Mishra and Ravishankar[8] edited a book contains the papers presented at the above seminar by management experts, senior researchers and eminent professors.

G.P. Keshava[9] argued that the overall performance of the public enterprise would be evaluated with reference to several aspects of its working, including product planning, utilisation of inputs, improvement in the quality of the product and of service.

President Hussain Muhammad Ershad has given the directive during a meeting with the executive committee of the Consultative Committee on Public Enterprises (CONCOPE) to give the public sector corporation more autonomy so that they can run on commercial consideration and improve their performance.[10]

The Industrial Worker's Wage and Productivity Commission of the Government of the People's Republic of Bangladesh feels that some serious thinking about the whole affairs of sub-standard operation of fertilizer sector must be done to streamline the most important sector for future development of the country which revolves around agricultural development.[11]

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8. Sarkar, T.L., Mishra, R.K. and Ravishankar, S., (Edited), Public Enterprises in India, (Bombay: Himalaya Publishing House, 1986).
9. Keshava, G.P., "Information Needs for Research in Public Enterprise", Paper presented in the national seminar of the Institute of Public Enterprise, Hyderabad in March, 1982.
10. The Bangladesh Observer, 23rd June, 1987 (Dhaka).
11. Government of the People's Republic of Bangladesh, "Industrial Worker's Wage and Productivity Commission", 1978, p.157.

For improving performance, in the production areas, actions are being taken to exceed the set target by optimum utilization of production capacity, utilization of manpower, reduction of down time, ensuring ideal operating condition, preventing wastage and loss of materials.[12]

Every fertilizer factory pre-plans the activities of a particular month. For instance, every factory sets its production target in terms of efficiency standards for the coming months and at the end of the month comparison is made between actual efficiency and the target efficiency in order to find out the variance.

Each month, Performance Evaluation and Co-ordination Meeting is held in the Head Office at the highest level. Monthly Performance Review and Co-ordination Meeting at the Head Office is presided over by the Chairman and attended by the Directors and Heads of Division. At the enterprise level, such review and appraisal sessions are presided by the Head of the enterprise on monthly and weekly basis depending upon the needs of the situation. Finally, the performance of the enterprises is comprehensively appraised and evaluated in Half Yearly and Annual Conference held at the Corporation Head Office. These series of review sessions at various levels have contributed towards achieving progressive success in various spheres of operation over the years.[13]

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12. Natural Gas Fertilizer Factory Limited, Annual Report 1983-84, (Fenchugonj), p.13.

13. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka), pp.14-15.

5.02 CAPACITY UTILIZATION

The importance of maximising capacity utilisation and productivity in the national economy can not be over-emphasized as argued by the famous Bangladeshi expert.[14] United Nations[15] categorically explain that one of the most serious problems of developing countries is their failure to operate fertilizer plant at a level near their rated capacity. The economic success of modern fertilizer plants usually depends on sustained operation at or near capacity. Each plant has a "Break-Even" operating rate, below which the operation is uneconomic. So, full utilization of existing capacity is emphasized.

There are several different concepts of plant capacity. According to Backer and Jacobsen,[16] the capacity of a plant might be viewed from the standpoint of its total maximum output. The word capacity refers to the ability to produce with the present resources and facilities which an organisation commands and in case of factories, capacity refers to number of units of products which it can produce or production for which it can work. World famous academicians Matz and Usry[17] have argued that the following capacity levels require attention: Theoretical, practical, expected actual and normal.

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14. Hossain, A.K.M. Mosharaff, "Management of Public Enterprises", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1983), p.10.
15. United Nations Industrial Development Organisation, Fertilizer Industry, (New Delhi: United Nations, 1969), p.47.
16. Backer, Morton, and Jacobsen, L.E., Cost Accounting, (New York: McGraw-Hill Book Company, 1964), p.150.
17. Matz, Adolph, and Usry, M.F., Cost Accounting, (Ohio: South-Western Publishing Co., 1982), p.540.

United Nations[18] have rightly reported that the cost of production can be considerably reduced by increasing plant capacity. Researcher[19] in our country has disclosed that idle capacity is pronounced in many of the jute mills and non-utilization of operable capacity to the full extent has the effect of raising production costs. Accordingly, Bangladeshi experts[20] opined, "Optimum utilisation of capacity should be ensured to reduce cost of production by eliminating production bottlenecks.

Much of the hard-earned and limited foreign exchange of the nation has been used to import plant and machinery for this industry. So the optimum utilisation of plant and equipment of the fertilizer factories would be a major contributor to maximising the gross national product obtained from the nation's scarce resources.

During the Second Five-Year Plan (1980-85),[21] and also in the Third Five Year Plan (1985-90),[22] particular attention has been given to the fertilizer sector, to achieve a higher degree of capacity utilisation in the fertilizer factories and to maximise production through improved management efficiency, increased machine and labour productivity, and reduced wastage. The government has indicated that

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18. United Nations Industrial Development Organisation, Fertilizer Industry, (New York: United Nations, 1969), p.21.

19. Habibullah, M., Cost Structure of the Jute Industry in Bangladesh, (Dhaka University: Bureau of Economic Research, 1979), p.99.

20. Habibullah, M. and Ahmed, Mahbub, Environmental Factors Affecting Operational Effectiveness of Nationalised Industries, (Dhaka: UNDP-ILO National Management Development Programme, 1982), p.36.

21. Government of the People's Republic of Bangladesh, The Second Five Year Plan (1980-85), (Dhaka: Planning Commission, 1980).

22. Government of the People's Republic of Bangladesh, The Third Five Year Plan (1985-90), (Dhaka: Planning Commission, 1985).

the public sector's annual losses from under-utilisation of capacity in the jute, cotton, sugar, steel, paperboard and fertilizer sectors amount to about Tk.500 crores.[23] Under-utilisation of capacity accounts for higher costs of production as the fixed costs are spread over a smaller number of units produced; the recovery of fixed cost is therefore directly related to the level of capacity utilisation.[24] Further more, under-utilisation of capacity affects not only the cost of production but also the volume of production, which in tern may adversely affect the profitability of the organisation.[25] These are indicators of the gravity of the problem.

Hossain in his study examined the effects of under-utilisation of capacity in the jute mills of Khulna Zone of Bangladesh and greater attention to capacity utilisation should contribute to reducing the cost of production and increasing profitability through efficient utilisation of the plant capacity.[26] He further examined that there is a correlation between high costs of production and a high level of idle capacity and as a result, production costs can be reduced and profitability can be improved with increased capacity utilization.[27]

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23. The Daily Ittefaq, Sub-editorial, Dhaka, 10 January, 1986.

24. Ahmed, Q.K., "The Jute Manufacturing Industry of Bangladesh 1947-74", unpublished Ph.D. thesis, London, November 1976, p.79.

25. Ahmed, Q.K., An Analysis of the Profitability of the Jute Manufacturing Industry of Bangladesh in the Post-Liberation Period, Bangladesh Institute of Development Studies, Dhaka, Research Report No. 10, June 1973.

26. Hossain, M. Mokarram, "A Study of Capacity Utilisation in the Jute Mills of Khulna Zone: Its effect on volume, cost of production, and profitability", (This seminar paper is prepared under the BMET Project - special programme at the George Washington University, during the Summer, 1987), Rajshahi University, Rajshahi, July 1987.

27. Ibid., p.6.

Kholiquzzaman[28] (1973) published a theoretical study on, "A Note on Capital Utilisation in the Jute Manufacturing Industry of Bangladesh", Habibullah[29] (1974), in his book "Industrial Efficiency and Profitability in Bangladesh", correctly pointed out that the most significant cause of low efficiency and low profitability of industrial enterprises in Bangladesh was the presence of under-utilisation of capacity. Afroz and Roy[30] (1976) in their study, "Capacity Utilisation in Selected Manufacturing Industries of Bangladesh", also found that there was significant under utilisation of capacity in the industries of Bangladesh during 1972-73.

Alimur Rahman[31] (1978), in his Ph.D. dissertation, "Capacity Utilisation in the large-scale Manufacturing Industry in Bangladesh", analysed for a sample of 80 mills in the jute textile, cotton textile and sugar industries for 1973-74 and it appeared that one-half to two-thirds of industrial productive capacity in large-scale manufacturing in Bangladesh remained idle or under-utilised, which was a serious drain on the country's economic resources. Shaha[32] (1978) in his article "Working Capital Management in the Jute Mills of Dhaka Zone, Bangladesh", also concluded

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28. Ahmed, Q.K., "A Note on Capacity Utilisation in the Jute Manufacturing Industry of Bangladesh", The Bangladesh Economic Review, Vol.1, No.1, January 1973, pp.103-114.

29. Habibullah, M., Industrial Efficiency and Profitability in Bangladesh, Bureau of Economic Research, Dhaka University, 1974, p.108.

30. Gul Afroz and Dilip Kumar Roy, "Capacity Utilisation in Selected Manufacturing Industries in Bangladesh," The Bangladesh Development Studies, Dhaka, Vol.IV, No.2, April 1976, pp.275-288.

31. Rahman, Alimur, "Capacity Utilisation in the Large-Scale Manufacturing Industry in Bangladesh", published Ph.D. thesis, University of Sussex, 1978 (published by the Institute of Business Administration, University of Dhaka, February, 1983).

32. Shaha, Abhinaya Chandra, "Working Capital Management in the Jute Mills of Dhaka Zone, Bangladesh", Rajshahi University Studies, Vol. XI, No.1, September 1978, p.79.

that under-utilization of capacity was one of the factors responsible for heavy operating losses in the jute mills during 1972-73 to 1977-78. Hye, Hoque, Loqman and Mahmud[33] (1979), in another study "Idle Capacity in the Jute Mills of Bangladesh : A Case Study of Chittagong Zone", also found that there was a significant idle capacity in the jute mills which seriously affected their profitability. They also focussed especially on cost reduction through better capacity utilisation in the jute mills.

Harris and Taylor[34] (1985), in their study, "The Measurement of Capacity Utilization", Berudt and Hesse[35] (1986) made a similar type of study entitled, "Measuring and Assessing Capacity Utilisation in the Manufacturing Sectors of Nine OECD Countries".

The available evidence suggests that any increase in capacity utilisation will mean a reduction in the average cost of production.[36]

In a developing country such as Bangladesh, it is very difficult to measure capacity utilisation of any industry with a sophisticated model because of the inadequacy of data. However, from the point of view of this study, capacity utilisation is defined in terms of the relation between the actual output obtained in a given period and the maximum output flow that could be obtained from the installed capital stock in the same period.

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33. Hye, M., Hoque, M.J., Loqman, M., and Mahmud, M.M., "Idle Capacity in the Jute Mills of Bangladesh", Bureau of Business Research, Chittagong University, 1979, p.80.

34. Harris, Richard, and Taylor, Jim, "The Measurement of Capacity Utilisation", Applied Economics, Vol.17, October, 1985, pp.849-866.

35. Berudt, E.R. and Hesse, D.M., "Measuring and Assessing Capacity Utilisation in the Manufacturing Sectors of Nine OECD Countries", European Economic Review, V.30, October 1986, pp.961-989.

36. Ahmed, Q.K., "A Note on Capacity Utilisation in the Jute Manufacturing Industry of Bangladesh", The Bangladesh Economic Review, Vol. 1, No. 1, January 1973, p.103.

The number one strategy of the Industrial Policy of the Government of the People's Republic of Bangladesh is to encourage optimum utilisation of existing capacity.[37] So, the optimum utilisation of installed capacity of the factories has been the matter of prime concern of the Bangladesh Chemical Industries Corporation.[38] The year 1980-81 was the first year of the Second Five Year Plan (SFYP) and as such the Bangladesh Chemical Industries Corporation formulated its development programme keeping in view the overall development target envisaged in the plan and in addition, the rehabilitation schemes were taken up to ensure full realisation of the installed capacity.[39] The year 1985-86, the 10th year of the functioning of the Corporation, also added with a very satisfactory record in respect of productivity and capacity utilisation. During 1985-86, the Corporation achieved 105% of the target, as a whole operated at 91% of the attainable capacity and 73% of the overall installed capacity.[40]

Bangladeshi expert[41] and Chairman, Bangladesh Chemical Industries Corporation has made a comparative study and mentioned that in terms of capacity utilization of fertilizer factories, Bangladesh ranks very high. During 1985-86, the percentage of capacity utilization of fertilizer factories was more than 80% in Bangladesh, in India it was only 74%.

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37. Government of the People's Republic of Bangladesh, Industrial Policy-1986, (Dhaka: Ministry of Industries, 1986), p.2.
38. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka), p.19.
39. Bangladesh Chemical Industries Corporation, Annual Report 1980-81, (Dhaka), p.14.
40. Bangladesh Chemical Industries Corporation, Annual Report 1985-86, (Dhaka), pp.11-12.
41. Hossain, A.K.M. Mosharraf, "Fertilizer Industry : Blue Print for Tomorrow", The Bangladesh Observer, (Dhaka: 26th February, 1987).

In India, the Nitrogen production capacity has increased from a modest 85,000 tonnes in 1951-52 to 67.42 lakh tonnes as on 1 October 1986. The Phosphatic fertilizer capacity has also increased from 63,000 tonnes in 1951-52 to 20.23 lakh tonnes of P_2O_5 in 1986-87 and the Seventh Plan has laid down a capacity target of 92.53 lakh tonnes of Nitrogen and 28.91 lakh tonnes of P_2O_5 by the end of the plan period (1989-90).[42]

M.L. Rahman presented a table (table-6.01) showing production capacities and utilisation of Fertilizer Sector in India and Bangladesh in his book entitled, "SAARC Facts and Economic Development".[43]

An Indian Scholar[44] and Member, Planning Commission, Government of India, has described in a very simple form and the fertilizer industries are categorised into:

(a) Public Sector,
(b) Joint Sector,
(c) Co-operative Sector, and
(d) Private Sector.

He has presented a Table (Table-6.02) (given herewith) shows that as against the average capacity utilisation of 87% of all private sector, units in the joint sector that of Gujarat Narmada Fertilizer Co. Bharich was 99% and of Gujarat State Fertilizer Co., Vandodera 107%. Similarly, the co-operative sector factories were working at 105% and 84% capacity. However, most of the wholly-owned government companies were working at lower capacity use levels.

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42. Government of India, India 1986 : A Reference Annual, (New Delhi: Publication Division, Ministry of Information and Broadcasting), pp.445-446.

43. Rahman, M.L., SAARC Facts and Economic Development, (Dhaka: SAARC Association, 1986), p.193.

44. Alagh, Yoginder K., "Pricing Planning and Strategy in Public Enterprises", Public Enterprises, (Ljubljana: International Center for Public Enterprises in Developing Countries, 1987), p.249.

Table - 6.01

Production Capacities and Utilisation
(Fertilizers)

(In 000 tons of Nutrients and in %)

	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
India:									
Annual Production Capacity	3310	3767	4573	4391	5186	5919	6186	6666	6795
Capacity Utilisation	55.2	63.4	59.2	68.3	58.2	51.7	66.8	66.8	67.9
Bangladesh:									
Annual Production Capacity	289	289	289	289	289	289	289	289	-
Capacity Utilisation	53.1	50.5	42.6	56.4	59.6	66.8	76.1	93.0	-

Source: FAO; Fertilizer Year Book, Fertilizer Statistics, FAO; HA Quazi, 1984, and Quated by Rahman, M.L., "SAARC Facts and Economic Development", (Dhaka: SARC Association, 1986), p.193.

Table - 6.02

The Fertilizer Industry in India

Company / Plant	March 1984-85	
	Capacity '000'p.t.a.	Capacity Utilization %
A. PUBLIC SECTOR		
1. Fertilizer and Chemicals:		
Alwaye - Udyogmande I	78.0	75
Ambalamedu - Cochin I	152.0	37
Ambalamedu - Cochin II	40.0	161
2. Fertilizer Corporation of India:		
Gorakhpur	131.0	60
Sindri	219.0	33
Ranagundam	228.0	24
Talcher	228.0	24
3. Hindustan Fertilizer Corporation Ltd.:		
Barauni	152.0	61
Durgapur	152.0	30
Namrup	197.0	38
4. Madras Fertilizer Ltd.:		
Manali	176.0	73
5. National Fertilizer Ltd.:		
Bhatinda	235.0	72
Nangal	232.0	60
Panipat	235.0	86

Contd.....

Table 6.02 continued

6. Neyveli Lignite Corp.:		
Neyveli	70.0	84
7. Rashtriya Chemicals and Fertilizer Ltd.:		
Trombay	317.0	85
8. Rashtriya Chemical and Fertilizer:		
Thal	683.0	63
9. Steel Authority of India Ltd.:		
Rourkala - Orissa	120.0	29
8 small plants	36.0	52
10. HLL Haldia:	290.0	56
Total Public Sector:	3,710.0	
B. JOINT SECTOR		
1. Gujarat Narmada Fertilizer Co.		
Bharich	273.0	99
2. Gujarat State Fertilizer Co.		
Vadodera	236.0	107
C. CO-OPERATIVE SECTOR		
1. IFFCO, Kanda/Kalol	260.0	105
2. IFFCO, Phulpur	228.0	84
3. Krbhow, Hazera	668.0	Stab (New Plant)
D. PRIVATE SECTOR (11 plants)	1,315.0	87

Source: Fertilizer Association of India.

In Bangladesh, all the fertilizer factories are in public sector i.e. under the control of Bangladesh Chemical Industries Corporation. The annual installed capacity for the selected fertilizer factories are shown below:

Table - 6.03

Factory	Products	Installed Capacity MT
1. Natural Gas Fertilizer Factory Limited	Urea	1,00,000
	Ammonium Sulphate	12,000
		1,12,000
2. Urea Fertilizer Factory Limited	Urea	3,40,000
3. Triple Superphosphate Complex Limited.	TSP	1,52,000
4. Zia Fertilizer Company Limited	Urea	5,28,000
	Total:	11,32,000

In Natural Gas Fertilizer Factory Limited, installed production capacity of 1,06,000 MT Urea. Another unit named Ammonium Sulphate plant was established and merged in 1970 with an installed capacity of 12,000 MT Ammonium Sulphate. Further, with the diversion of Ammonia, the main intermediate product for the production of Ammonium Sulphate, the installed capacity of Urea production was reduced to 1,00,000 MT annually from 1,06,000 MT. So the actual installed capacity of Natural Gas Fertilizer Factory Limited would be annually 1,00,000 MT of Urea.[45]

45. Natural Gas Fertilizer Factory Limited Annual Report 1983-84, (Fenchuganj), p.6.

Capacity utilization of the Fertilizer Factories in Bangladesh for the last ten years from 1976-77 to 1985-86 is 68.67% (Table-6.04). Produce-wise capacity utilization, Ammonium Sulphate 81.97%, Urea 75.02% and TSP 42.62%.

Year-wise capacity utilization trend is increasing. In the year 1976-77 it was only 55.10% and now in 1985-86 is increased to 81.55% (Table-6.05).

Factory-wise capacity utilization for the last ten years are shown below:

Natural Gas Fertilizer Factory Limited	-	83.84%
Urea Fertilizer Factory Limited	-	71.46%
Triple Sulperphosphate Complex Limited	-	42.62%
Zia Fertilizer Company Limited	-	76.95%

During the last ten years actual production of the above factories were 52,35,377 MT against the installed capacity of 76,24,000 MT which means 23,88,623 MT (76,24,000 - 52,35,377). Idle capacity and the percentage of idle capacity is (100% - 68.67%) 31.33%.

Table - 6.04

Statement showing the capacity utilization of fertilizer factories in Bangladesh for the last ten years (1976-77 to 1985-86)

Factories	Annual installed capacity MT	Years	Total Production capacity MT	Total Production MT	% of capacity utilized %
A. Ammonium Sulphate:					
NGFF	12,000	10	1,20,000	98,364	81.97
B. Urea:					
NGFF	1,00,000	10	10,00,000	8,40,653	84.07
UFFL	3,40,000	10	34,00,000	24,29,634	71.46
ZFCL	5,28,000	3	15,84,000	12,18,896	76.95
			59,84,000	44,89,183	75.02
C. TSP:					
TSPC	1,52,000	10	15,20,000	6,47,830	42.62
D. Total (A+B+C) :			76,24,000	52,35,377	68.67

Notes: NGFF = Natural Gas Fertilizer Factory Limited
UFFL = Urea Fertilizer Factory Limited
ZFCL = Zia Fertilizer Company Limited
TSPC = Triple Superphosphate Complex Limited

Table - 6.05

Statement showing the capacity utilization of fertilizer factories in Bangladesh for the last ten years, factorywise (1976-77 to 1985-86)

	NGFF Fenchugonj	UFFL Ghorasal	TSPC Chittagong	ZFCL Ashugonj	Total
Installed Production Capacity	As 12,000 MT U 1,00,000 MT 1,12,000 MT	3,40,000 MT	1,52,000 MT	5,28,000	6,04,000 MT 11,32,000 MT from 1983-84
Year	% of capacity utilized	% of capacity utilized	% of capacity utilized	% of capacity utilized	% of capacity utilized
1976-77	77.42	61.20	25.00	-	55.10
1977-78	63.38	44.42	27.15	-	43.59
1978-79	53.54	69.45	40.98	-	59.33
1979-80	102.18	75.47	46.79	-	73.21
1980-81	97.33	72.20	47.01	-	70.53
1981-82	92.95	74.37	38.08	-	68.69
1982-83	88.79	83.48	45.13	-	74.82
1983-84	88.46	75.64	53.45	71.79	72.13
1984-85	93.68	68.16	36.31	78.51	71.23
1985-86	80.64	90.20	66.29	80.55	81.55
Total :	83.84	71.46	42.62	76.95	68.67

Reference: Prepared by the researcher from the Annual Reports and Audit Reports.

About the capacity utilization of fertilizer factories in Bangladesh, an eminent economist has regreted that unfortunately, the present rate of capacity utilization is low and erratic and this under utilization was most serious at the country's only TSP complex.[46]

When costs are not related to normal capacity they vary with the output. During the periods of capacity utilizations the costs goes up but if the production is high, the costs are reduced. Unit cost of production increases with the idle capacity and this is largely due to the fact that the fixed cost may not be curtailed with the decrease in output. Idle capacity costs are represented mostly by the fixed charges relating to owning and maintaining plant and equipment and employing services which are not used at their maximum potential. It may be mentioned that fixed costs originate principally from the initial provision of capacity to do business, while variable costs are incurred for utilising the capacity to produce. Thus, idle capacity has no bearing on variable costs. So far as fixed costs are concerned, in case of idle capacity only a portion of the attending fixed costs are productive of benefits, the remainder represents costs of idle capacity. The cost of idle capacity must be included in the total production cost. For which per unit production cost increases.

In a capital-scarce economy like Bangladesh, production performance of public enterprises in terms of the optimum utilization of resources in the form of men, materials, machinery etc. is of paramount importance. Under utilisation or non-utilization of the

46. Quasem, Md. Abdul, "Supply and Distribution of Fertilizers in Bangladesh", Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh, (Dhaka: BIDS and Washington: IFPRI, 1985), p.5.

resources means a severe loss to the nation. One of the important indicators of their efficient operation and profitable performance is capacity utilisation.

Utilization of capacity mainly depends on stream days along with rated capacity. If any factory runs in maximum days with maximum rated capacity and it will automatically reach the optimum capacity level. If we look into the case of Zia Fertilizer Company Limited, operated at 78.51% and 80.55%. Installed capacity during 1984-85 and 1985-86 respectively which can be shown in the following Table-6.06.

Table - 6.06

Statement showing the capacity utilization of ZFCL for 1984-85 and 1985-86

Capacity Utilization	Days	
	1984-85	1985-86
100%	58	87
95% and above	49	91
90% and above	60	29
85% and above	23	37
80% and above	44	6
Less than 80%	54	35
Total stream days	288	285
Down time	77	80
	365	365

In fine we can say, stream days along with rated capacity per day determines the annual capacity utilization for which the various causes of idle capacity will be eliminated.

Utilization of plant capacity discloses the cost-volume-profit analysis. The following table shows the effect for varying volumes of production, on costs and resultant profit.

Table - 6.07

Plant Capacity (Value in Lac Taka)

Particulars	80%	88.24%	90%	100%	110%
Production Qty. (MT)	272,000	300,000	306,000	340,000	374,000
Price per MT (in Taka)	2656	2656	2656	2656	2656
Sales value of Production	7224.32	7968.00	8127.36	9030.40	9933.44
Variable Expenses:					
Direct Materials	2254.87	2486.99	2536.73	2818.59	3100.45
Packing Materials	1142.40	1260.00	1285.20	1428.00	1570.80
Spares & Maintenance	136.00	150.00	153.00	170.00	187.00
Factory overhead	170.46	188.01	191.77	213.08	234.38
Selling & Distribution overhead	105.06	115.87	118.19	131.32	144.45
Contract of labour	27.20	30.00	30.60	34.00	37.40
Total variable cost	3835.99	4230.87	4315.49	4794.99	5274.48
C.M. (Sales-TVC)	3388.33	3737.13	3811.87	4235.41	4658.96
Fixed Expenses:					
Factory overhead	1520.17	1520.17	1520.17	1520.17	1520.17
Admn.& Selling Overhead	246.32	246.32	246.32	246.32	246.32
Financial charges	762.95	762.95	762.95	762.95	762.95
Salaries & Wages	493.46	493.46	493.46	493.46	493.46
Total Fixed Cost	3022.90	3022.90	3022.90	3022.90	3022.90
Profit	365.43	714.23	788.97	1212.51	1636.06

Note: Budgeted amounts have been taken as standard.

Source: Urea Fertilizer Factory Limited, Annual Report and Accounts 1985-86, Ghorasal, p.28.

Among the fertilizer factories in Bangladesh, Triple Superphosphate Complex Limited utilized lowest capacity i.e. only 42.62% for the last ten years. Since commissioning of the plant, production could never be made more than 66.29% of installed capacity which was achieved only in 1985-86 after taking many improvement measures. The management took various steps to improve capacity utilization. Many additions and alternations were made in the plants with the assistance of local experts and also foreign experts.

Besides, after eleven years of operation, the condition of some machineries has deteriorated due to corrosion, erosion, normal wear and tear etc. These deteriorated condition of machineries increased down time abnormally. Due to frequent breakdown of machineries for above reasons besides occasional shortage of imported raw materials and non-lifting of finished product by BADC in time. All these factors restricted attainable capacity and actual production was much lower than installed capacity.

With a view to utilizing the installed capacity of 1,52,000 MT. TSP the improvement programme undertaken with effect from 1981-82 in the name and stule "Fertilizer Industries Rehabilitation Programme: FIRP" at estimated cost of Tk.3904.00 lacs is in progress. It is expected that the company will fully utilize its installed capacity from 1986-87 if BADC can lift the entire production in time.[47]

In order to maximise stream days, preventive maintenance has been geared up in each enterprise and the annual over-haul plan of each enterprise was drawn-up well in time and the shut down was carried out accordingly.[48]

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47. Triple Superphosphate Complex Limited, "Annual Report 1985-86", (Chittagong), p.8.

48. Bangladesh Chemical Industries Corporation, "Annual Report 1985-86", (Dhaka), p.13.

5.03 MANPOWER POSITION AND LABOUR PRODUCTIVITY

Management expert of our country expressed that the success of manpower planning for industrialization depends to a great extent on the adequacy and effectiveness of manpower generating system of the country.[49] According to Bangladeshi academician Professor D. Bhattacharjee,[50] the success of the industrial development programmes of a given country largely depends upon the effectiveness of operations of managerial people. Bangladeshi expert[51] opined that Bangladesh seriously lacks a systematic and sound wage and salary administration policy which mainly results in employee dissatisfaction in our factories leading to lower productivity and poor quality of work.

An Indian expert[52] described that the public sector projects roused high expectations for jobs, they become burdened with the costs and inefficiencies of excessive manpower. For example, the Gorakhpur plant had to employ 2,500 persons. More than 1,500 was not necessary. None of the private sector projects had to suffer from this disadvantage. Famous Indian research scholar Laxmi Narain[53] expressed in his intensive study that manpower planning

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49. Islam, M.N., "Manpower Planning for Industrialization", Management Development, (Dhaka: Bangladesh Management Development Centre, 1972), p.29.

50. Bhattacharjee, Durgadas, "Managerial Performance of the Public Sector Industry : A Review of Concepts and Trends of Performance of the Sugar Industry in Bangladesh", The Dhaka University Studies, Part-C, (Dhaka: 1985), p.75.

51. Ali, A., "Problems of Wage and Salary Administration", Management Development, (Dhaka: Bangladesh Management Development Centre, 1972), p.49.

52. Ghosh, Sailendranath, "Fertilizer Technology : Fractured Profile of Self-Reliance", Economic and Political, (Bombay: 1986), p.701.

53. Narain, Laxmi, Public Enterprise in India, (New Delhi: S. Chand & Co. Ltd., 1975), p.89.

is the Achilles' heel of the economy as well as of most of the public enterprises which provide per capita value of production for all the employees, preferably of the production staff can also provide a broad inter-period comparison of labour efficiency but the subject does not find much mention in the annual report.

Metropolitan Chamber of Commerce and Industry[54] (MCCI), Dhaka in its recent review reported that Bangladesh is one of the few countries whose labour productivity in 1985 was still lower compared to 1970. Labour productivity in Bangladesh showed a decline by about 23 percent during the period, 1970-85. This decline compared very unfavourably to the situation prevailing in the neighbouring South Asian Countries. Labour productivity increased by 163% in Pakistan and 52% in India during the same period.

Let us have a look on the productivity of industrial labour in the Bangladesh Fertilizer Sector (Table-6.08) which disclosed with the other selected industries of Bangladesh at constant prices by the government.[55]

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54. The Bangladesh Observer, (Dhaka: 1987), 8th September.

55. Government of the People's Republic of Bangladesh, Statistical Pocket Book of Bangladesh 1987, (Dhaka: Bangladesh Bureau of Statistics, 1988), p.127.

Table - 6.08

Productivity indices of industrial labour in fertilizer industry of Bangladesh at constant prices

(Base : 1976-77 = 100)

Year	Fertilizer	
	Production Workers	All Employees
1979-80	138	105
1980-81	124	103
1981-82	125	102
1982-83	143	115
1983-84	182	139
1984-85	218	154
1985-86	246	163

Source: Statistical Pocket Book of Bangladesh, 1987.

We may list indicators as: Frequency of accidents, carelessness, complaints not handled satisfactorily, excessive gossips, absence of pride in the job, ignorance about factory rules and regulations, defective products, high production cost, high wastage ratio, high pilferage, commotion over promotion policy etc. According to M. Rahman,[56] the nationalised corporations in Bangladesh appears to have been managed through the application of theory-X, where the primary assumption about the people is that the people are inherently lazy and they can not be trusted. A group of

56. Rahman, Mawdudur, "A note on controls and accounting in nationalised corporations in Bangladesh", Management, Business and Economics, (Dhaka: The Institute of Business Administration, University of Dhaka, Vol.4, No.1, 1978), p.77.

psychologists[57] of the University of Dhaka, became concerned about the industrial situation in the country and undertook a series of investigations headed by Professor M. Raushan Ali and found that there was an acute problem of labour discipline during the period between July 1973 and August 1974 and problems like gherao, absenteeism, late attendance, negligence of duty, indiscipline, violence, etc. were severe in nationalized industries.

According to BCIC's report, the entire personnel strength in the corporation as on 30-6-86 was 24,443 comprising 810 persons in head office and 23,633 persons at the enterprises of which 3,510 officers, 7,217 staff and 13,716 workers.[58] The enterprises require to emphasize upon regular training of executives, staff and workers. During the decade under review (1976-77 to 1985-86), 2,304 persons were imparted apprenticeship training, 949 persons in-plant supervisory training 3,906 persons institutional training totalling 7,629 persons including the training of 470 officers abroad.[59]

It has been noted that while there was no formal policy concerning labour in the British period, the whole of Pakistan and Bangladesh periods were, however, characterised by frequently declared labour policies. During the whole Pakistan and Bangladesh era of about 40 years, there were as many as six labour policies - each of which was full of hopeful pledges to the workers but very few of those pledges were in fact implemented.[60]

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57. Ali, Muhammad Raushan, Achievement Motivation and Industrial Productivity in Bangladesh, (Dhaka: University of Dhaka, 1979), p.123.
58. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka: 1986), p.45.
59. Ibid., p.45.
60. Khan, Md. Abbas Ali, "Government Policies Towards Labour in Bangladesh : A Historical Analysis", The Dhaka University Studies, Part-C, (Dhaka: Vol.VII, No.2, December, 1986), p.98.

The total manpower position as on 30-6-86 of the said fertilizer factories was 4,744 of which 1,932 workers, 1,522 staff and 1,290 officers which can be shown below:

Table - 6.09

Manpower position of fertilizer factories in Bangladesh as on 30th June, 1986

Factories	Manpower Position			
	Worker	Staff	Officer	Total
NGFF	727	345	264	1,336
UFFL	418	524	447	1,389
TSPC	488	272	234	994
ZFCL	299	381	345	1,025
Total :	1,932	1,522	1,290	4,744

Let us look into the manpower position and labour productivity of different fertilizer factories, separately.

1) Natural Gas Fertilizer Factory Limited

a) Manpower Position:

Total manpower position of the Natural Gas Fertilizer Factory Limited as on 30.6.77 was 1,537 and on 30.6.86 was 1,336 and the yearly average for the period was 1,433 (Table-6.10) which is less than the approved set of 1,594.

Table - 6.10

Natural Gas Fertilizer Factory Limited

Manpower Position

Year	Category			Total Staff
	Worker	Staff	Officer	
1976-77	900	427	210	1,537
1977-78	900	427	210	1,537
1978-79	900	427	210	1,537
1979-80	946	341	190	1,477
1980-81	866	374	204	1,444
1981-82	775	375	236	1,386
1982-83	755	365	227	1,347
1983-84	796	358	213	1,367
1984-85	761	349	253	1,363
1985-86	727	345	264	1,336
Average	832	379	222	1,433
Approved set up	881	449	264	1,594

b) Labour Productivity:

Yearly labour productivity can be calculated, yearly production unit divided by man power position at the year end. This can give us production per man per year. In the Natural Gas Fertilizer Factory Limited, labour productivity in 1976-77 was 56.6 MT and in 1985-86 was 67.4 MT and the yearly average for the last ten years was 66.0 MT which includes the production of Ammonium Sulphate and Urea Fertilizer (Table-6.11).

Table - 6.11

Natural Gas Fertilizer Factory Limited

Labour Productivity

Year	Total Staff	Production '000' MT	Productivity (Ton/Year/Worker)
1976-77	1,537	87	56.6
1977-78	1,537	71	46.2
1978-79	1,537	60	39.0
1979-80	1,477	114	77.2
1980-81	1,444	109	75.5
1981-82	1,386	104	75.0
1982-83	1,347	99	73.5
1983-84	1,367	99	72.4
1984-85	1,363	105	77.0
1985-86	1,336	90	67.4
Yearly Average			66.0

ii. Urea Fertilizer Factory Limited

a) Manpower Position:

In the Urea Fertilizer Factory Limited, manpower position as on 30.6.77 was 1,017 and on 30.6.86 was 1,389 and the yearly average for the period was 1,174. Table-6.12 gives us the clear idea of manpower position in different category yearwise.

Table - 6.12

Urea Fertilizer Factory Limited

Manpower Position

Year	Category			Total Staff
	Worker	Staff	Officer	
1976-77	454	393	170	1,017
1977-78	496	386	200	1,082
1978-79	455	396	187	1,038
1979-80	486	439	203	1,128
1980-81	543	436	200	1,179
1981-82	594	415	214	1,223
1982-83	574	397	254	1,225
1983-84	589	406	244	1,239
1984-85	361	391	468	1,220
1985-86	418	524	447	1,389
Average	497	418	259	1,174
Approved set up	572	536	273	1,381

b. Labour Productivity:

Labour productivity of the Urea Fertilizer Factory Limited in 1976-77 was 204.5 MT and in 1985-86 increased to 221.0 MT and the yearly average was 206.4 MT (Table-6.13).

Table - 6.13

Urea Fertilizer Factory Limited

Labour Productivity

Year	Total Staff	Production '000' MT	Productivity (Ton/Year/Worker)
1976-77	1,017	208	204.5
1977-78	1,082	151	139.6
1978-79	1,038	236	227.4
1979-80	1,128	257	227.9
1980-81	1,179	245	207.8
1981-82	1,223	253	206.9
1982-83	1,225	284	231.8
1983-84	1,239	257	207.4
1984-85	1,220	232	190.2
1985-86	1,389	307	221.0
Year Average			206.4

iii) Zia Fertilizer Company Limited

(a) Manpower Position:

Manpower position of Zia Fertilizer Company Limited as on 30.6.84 was 1,081 and on 30.6.86 was 1,025 and the yearly average is 1,059 (Table-6.14).

Table - 6.14

Zia Fertilizer Company Limited

Manpower Position

Year	Category			Total Staff
	Worker	Staff	Officer	
1980-81	-	-	-	-
1981-82	-	-	-	-
1982-83	Commission in 1983-84			
1983-84	363	471	247	1,081
1984-85	349	432	291	1,072
1985-86	299	381	345	1,025
Average	337	428	294	1,059
Approved set up	436	342	224	1,002

b. Labour Productivity:

Labour productivity of Zia Fertilizer Company Limited for the year 1983-84 was 350.6 MT and for the year 1985-86 was 414.6 MT and the yearly average 384.1 MT (Table-6.15).

Table - 6.15

Zia Fertilizer Company Limited

Labour Productivity

Year	Total Staff	Production '000' MT	Productivity (Ton/Year/Worker)
Commissioned in 1983-84			
1983-84	1,081	379	350.6
1984-85	1,072	415	387.1
1985-86	1,025	425	414.6
Yearly Average			384.1

iv) Triple Superphosphate Complex Limited

a) Manpower Position:

In the Triple Superphosphate Complex Limited, manpower position as on 30.6.77 was 654 and on 30.6.86 was 994 and the yearly average is 950 which is below the approved set up (Table-6.16).

Table - 6.16

Triple Superphosphate Complex Limited

Manpower Position

Year	Category			Total Staff
	Worker	Staff	Officer	
1976-77	300	239	115	654
1977-78	316	241	122	679
1978-79	574	303	183	1,060
1979-80	580	299	168	1,047
1980-81	615	293	161	1,069
1981-82	604	280	155	1,039
1982-83	571	256	149	976
1983-84	564	260	151	975
1984-85	529	263	211	1,003
1985-86	488	272	234	994
Average	514	271	165	950
Approved set up	607	291	195	1,093

b. Labour Productivity:

Labour productivity of the Triple Superphosphate Complex Limited in the year 1976-77 was 58.1 MT and in 1985-86 was 101.6 MT and the yearly average was 67.7 MT (Table-6.17).

Table - 6.17

Triple Superphosphate Complex Limited

Labour Productivity

Year	Total Staff	Production '000' MT	Productivity (Ton/Year/Worker)
1976-77	654	38	58.1
1977-78	679	41	60.4
1978-79	1,060	62	58.5
1979-80	1,047	71	67.8
1980-81	1,069	71	66.4
1981-82	1,039	58	55.8
1982-83	976	69	70.7
1983-84	975	81	83.1
1984-85	1,003	55	54.8
1985-86	994	101	101.6
Yearly Average			67.7

Analysis of Manpower Position:

Manpower position of the selected fertilizer factories can be classified into three categories viz. Worker, Staff and Officers. Approved set up is to perform the full operational capacity but surplus manpower creating increased cost and the manpower below the approved set up also increating trouble which produced below the capacity and ultimately increasing per unit cost. Table-6.18 gives us the clear idea of different categories of total manpower, approved set up and shortage/surplus of the selected fertilizer factories.

Table - 6.18

Comparative yearly average manpower position for the last ten years

(1976-77 to 1985-86)

Factory	Particulars	Category			Total Staff
		Worker	Staff	Officer	
NGFF	Approved set up	881	449	264	1,594
	Actual	832	379	222	1,433
	Shortage	49	70	42	161
UFFL	Approved set up	572	536	273	1,381
	Actual	497	418	259	1,174
	Shortage	75	118	14	207
ZFCL	Approved set up	436	342	224	1,002
	Actual	337	428	294	1,059
	Shortage	99	(-86)	(-70)	(-57)
TSPC	Approved set up	607	291	195	1,093
	Actual	514	271	165	950
	Shortage	93	20	30	143
Total :	Approved set up	2,496	1,618	956	5,070
	Actual	2,180	1,496	940	4,616
	Shortage	316	122	16	454

Note : Actual is the average of the last ten years.

NGFF = Natural Gas Fertilizer Factory Limited
UFFL = Urea Fertilizer Factory Limited
ZFCL = Zia Fertilizer Company Limited
TSPC = Triple Superphosphate Complex Limited

Analysis of the Labour Productivity

The Natural Gas Fertilizer Factory Limited, produces Ammonium Sulphate and Urea Fertilizer in the same manpower and in the continuous process. So, it is not possible to identify the manpower required for Ammonium Sulphate and Urea separately. Therefore, the factory can not be compared with any other factory. Only yearwise productivity level can be compared for cost control and cost reduction purposes.

The Urea Fertilizer Factory Limited and the Zia Fertilizer Company Limited produces one single product i.e. Urea. So, these two fertilizer factories can be compared for productivity level. But the Zia Fertilizer Company Limited started the commercial production from 1983-84 and we are in a position to compare the productivity of 1983-84, 1984-85, 1985-86 and son. Table- 6.19 indicates that Zia Fertilizer Company Limited is always better productivity than the Urea Fertilizer Factory Limited i.e., the ratio of UFFL and SFCL is 207.4: 350.6; 190.2: 387.1 and 221.0: 414.6.

TSP Complex Limited, is a single TSP factory in Bangladesh and so it is not possible to compare with any other fertilizer factories. Therefore, it is better to compare its yearwise labour productivity.

Let us have a look the labour productivity of different fertilizer factories yearwise (Table-6.19).

Table - 6.19

Labour Productivity
(Ton/Year/Worker)

Factories	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	Yearly Average
Natural Gas Fertilizer Factory Ltd.	56.6	46.6	39.0	77.2	75.5	75.0	73.5	72.4	77.0	67.4	66.0
Urea Fertilizer Factory Limited, Ghorashal	204.5	139.6	227.4	227.8	207.8	206.9	231.8	207.4	190.2	221.0	206.4
Zia Fertilizer Company Limited, Ashugonj.	Commission in 1983-84							350.6	387.1	414.6	384.1
Triple Super-Phosphate Complex Ltd. Chittagong.	58.1	60.4	58.5	67.8	66.4	55.8	70.7	83.1	54.8	101.6	67.7

In our country, there is a limited chance to evaluate the performance of labours, supervisors, foreman, etc. truely. As the root of performance evaluation is defective, operation of incentive plan becomes ineffective. So, proper man is not honoured. That is why, most of our nationalised industries are suffering from low quality, high labour turnover, huge wage cost and ultimately low labour productivity.

Idle time labour costs arise in a factory when the manpowers are paid for time spent waiting for work or for the repair of a machine. It is a form of indirect labour but in order that the management may have a comparative figure of the amount of loss arising from poor factory planning or from old, worn equipment, it should be recorded in a separate statement. There may be careless operation, poor tools, poor light, inexperience, low wage rate, improper speed of machinery, and even poor supervision. Once the causes have been determined, steps can be taken to eliminate them.

In many factories, there are individual worker efficiency reports and idle machine reports. Although more appropriately termed engineering reports.

Table - 6.20

Labour productivity of urea fertilizer plants
(Gas Based Plants)

Year	Number of Factories	Installed capacity '000 MT	Total Staff	Staff per unit of capacity	Production '000 MT	Productivity (Ton/Year/ Worker)
1976-77	2	452	2,554	0.00565	286	112.0
1977-78	2	452	2,619	0.00579	212	80.9
1978-79	2	452	2,575	0.00570	291	113.0
1979-80	2	452	2,605	0.00576	361	138.6
1980-81	2	452	2,623	0.00580	345	131.5
1981-82	2	452	2,609	0.00577	345	132.2
1982-83	2	452	2,572	0.00569	371	144.2
1983-84	3	980	3,687	0.00376	724	196.4
1984-85	3	980	3,655	0.00373	742	203.0
1985-86	3	980	3,750	0.00383	812	216.5

Ref: Prepared by the researcher.

Table - 6.21

Labour Productivity of TSPC Fertilizer Plant

Year	Number of Factories	Installed capacity '000' MT	Total Staff	Staff per unit of capacity	Production '000'MT	Production (Ton/Year/ Worker)
1976-77	1	152	654	0.00430	38	58.1
1977-78	1	152	679	0.00447	41	60.4
1978-79	1	152	1,060	0.00697	62	58.5
1979-80	1	152	1,047	0.00689	71	67.8
1980-81	1	152	1,069	0.00703	71	66.4
1981-82	1	152	1,039	0.00684	58	55.8
1982-83	1	152	976	0.00642	69	70.7
1983-84	1	152	975	0.00641	81	83.1
1984-85	1	152	1,003	0.00660	55	54.8
1985-86	1	152	994	0.00654	101	101.6

References: Prepared by the researcher.

Table - 6.22

Labour productivity of urea fertilizer plants in India

Total 11 plants (1983-84)

Particulars	Naptha based plants	Fuel oil based plants	Gas based plants	Total of 11 plants
1. Total staff	7366	3226	1253	11845
2. Total capacity of plants '000' ton	2370	1336.5	722	4428.5
3. Staff per unit of capacity	0.00311	0.00241	0.00173	0.00267
4. Production ('000' ton)	14448.4	808.1	645.9	2902.4
5. Productivity (Ton/Year/Worker	196. 6	250.5	515.5	245.0

Source: Inter-firm comparison of Public Sector Fertilizer Plants, Interim Report, Bureau of Public Enterprises. Ministry of Finance, Government of India, September 1985 (Mimeo) and M.A. Quazi, and also quoted by M.L. Rahman, SAARC Facts and Economic Development, Dhaka, 1986, p.197.

5.04 DOWN-TIME

When the factory is running smoothly but due to some simple reasons the entire production is closed down and every elements of costs remains idle. This type of close down we may called down time. The factory faced various problems, sometimes with complete shut-down of the total production process.[61]

Here we are to find out the down time of the selected fertilizer factories for the last ten years i.e. from 1976-77 to 1985-86. In 1976-77 down-time was in average 167 days and in 1982-83 reduced to 135 days. But with the commercial production started in the Zia Fertilizer Company Limited average down-time is reducing and in 1983-84 average down-time was 117 days and in 1985-86 it was 109 days which can be shown in Table-6.23.

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61. Urea Fertilizer Factory Limited, Annual Report and Accounts 1985-86, (Ghorashal), p.8.

Table - 6.23

Fertilizer Industry of Bangladesh

Statement of yearly down-time for the last ten years (1976-77 to 1985-86)

Figures in days

Years	NGFF	UFFL	ZFCL	TSPC	Average
1976-77	138	143	-	220	167
1977-78	161	203	-	234	199
1978-79	192	111	-	214	172
1979-80	49	90	-	199	113
1980-81	65	113	-	184	121
1981-82	99	116	-	239	151
1982-83	100	77	-	227	135
1983-84	120	94	55	197	117
1984-85	56	36	77	250	105
1985-86	100	84	80	171	109
Average	108	107	71	214	125

References: Prepared by the researcher from the Annual Reports.

Out of 365 days in a year average 125 days is down-time which caused low production and ultimately increased production cost per unit. So, we can say if we can reduce down-time which ultimately control and reduce cost.

Let us look into the causes of down-time of fertilizer factories in Bangladesh. Different fertilizer factories presented different causes of down-time but for our study we prepared an uniform causes of down-time. During the last ten years (1976-77 to 1985-86), though there is a provision of schedule shut down but except ZFCL there is no proper shut-down procedure which caused anomaly of factory maintainance and overhauling. Among the causes of down-time we can present them in accordance to their percentage of total down-time which are given below:

1.	Mechanical trouble ...	48%
2.	Schedule shut-down ...	25%
3.	Shortage of raw materials ...	13%
4.	Power trouble ...	9%
5.	Non-lifting of finished goods .	3%
6.	Shortage of spare parts ...	2%
	Total:	100%

Table-6.24 gives us the clear idea.

Factorywise causes of down-time can be shown:

1. Natural Gas Fertilizer Factory Limited : Appendix-6.01
2. Urea Fertulizer Factory Limited : Appendix-6.02
3. Zia Fertilizer Company Limited : Appendix-6.03
4. Triple Superphosphate Complex Limited : Appendix-6.04

Table - 6.24

Fertilizer Industry of Bangladesh

Statement of yearly average down-time for the last ten years (1976-77 to 1985-86)

(Figures in Days)

Causes of Down-time	NGFF	UFFL	ZFCL	TSPC	Average	% of Down-Time
1. Power Trouble	16	13	3	11	11	9
2. Mechanical trouble	58	55	33	94	60	48
3. Shortage of spare parts	7	-	-	-	2	2
4. Shortage of raw-materials	8	4	-	52	16	13
5. Non-lifting of finished goods	-	-	-	16	4	3
6. Schedule shut down	19	35	35	41	32	25
Todal Days :	108	107	71	214	125	100

The Natural Gas Fertilizer Factory Limited in its annual report mentioned that usual maintainance problems and increased trouble in plant faced due to ageing, wear and tear of various equipments/ machinery, the following major constraints were encountered during 1983-84.[62]

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62. Natural Gas Fertilizer Factory Limited, Annual Report 1983-84, (Fenchugonj), p.10.

(a) Forced shut down of factory for 62 days during mid-July to mid-September due to suspension of feed stock of disruption of pipe line at Illashpur canal.

(b) Forced shut down of Ammonium Sulphate plant on 3.6.84 (which continued for about 3 months) due to non-availability of Sulphur for disruption of railway communication, the only mode of transportation.

(c) Despatch of finished stock seriously hampered due to poor lifting of Urea by BADC on account of shortage of wagon/locomotive and disruption of railway communication.

The Triple Superphosphate Complex Limited in its annual report mentioned that total down-time suffered during 1983-84 was 197 days being 129 days for troubles with shovel loaders, process, machinery, equipments due to corrosion, wear and tear etc., 7 days for power failure, 23 days for commissioning of granulation plant and Sulphur Filter, 38 days for non-lifting of finished product,[163] and in 1985-86 down-time was 171 days mainly for shortage of raw materials, sweet water and power failure. Although lifting of TSP by BADC was irregular.[64]

TSP Complex Limited was closed on 15.10.85 due to shortage of Rock Sulpher which is the main imported raw materials and after getting the Rock Sulpher the expected time to start the production it is required at least more than one month. The factory was closed

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63. TSP Complex Limited, Annual Report 1983-84, (Chittagong), p.12.
64. TSP Complex Limited, Annual Report 1985-86, (Chittagong), p.8.

down for 529 days out of ten years 1975 to 1984 due to shortage of raw materials and the factory sustained loss during the period of Tk.16.00 crore.[65]

The Chittagong Urea Fertilizer Factory Limited were shut-down in 1987 due to non-lifting of Urea which suffered production of 88,000 MT waiting for exporting due to lack of shipment and decision from the Head Office but once the factory completely shut down, it requires 21 days for reproduction.[66]

The Bangladesh Chemical Industries Corporation is giving emphasis to reduce down-time which it disclosed its annual reports and periodicals as emphasis was consistently given to preventive maintenance along with required down-time and necessary rectifying measures.[67] Elaborate system has been laid down to record and analyse the down-time on account of mechanical, electrical break down, shortage of raw materials, marketing constraints, power failure, absenteeism etc. Production and MIS Divisions in Head Office regularly monitor the trend of down-time to minimise its incidence at the lowest possible level. At the enterprise level, detailed registers are maintained and meticulous analysis is carried out to avoid the recurrences of shut-down on avoidable reasons.[68]

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65. The Daily Ittefaq, Dhaka, 23rd October, 1985.
66. The Inkilab, Dhaka, 27th April, 1988.
67. Bangladesh Chemical Industries Corporation, Annual Report 1978-79, (Dhaka), p.9.
68. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka), pp.19-20.

CHAPTER - VII

COST CONSCIOUSNESS OF THE EXECUTIVES OF THE FERTILIZER FACTORIES UNDER STUDY

An attempt has been made to ascertain the attitude and views of the executives of the fertilizer factories about cost control and cost reduction. The views were obtained with the help of a questionnaire developed on the 5 point scale (Appendix-7.01). In framing questionnaire for this study, the researcher consulted most of the studies on cost control and cost reduction, some doctoral dissertations available in the libraries of Dhaka University, Chittagong University, Rajshahi University, Bangladesh Institute of Development Studies, and also the Institute of Business Administration. In the light of the review of these literature, pilot study and in consultation with the research supervisor, four sets of structured questionnaire were set up — one for general personal information, one for cost control, one for cost reduction and one for suggestions. The researcher himself interviewed the respondents with the help of the questionnaire. Every effort was made to build proper rapport with the respondents. They were told that the study was an academic exercise and had nothing to do with their enterprise management or any oother external agency. They were assured of the confidential nature of their reports to the researcher.

The following were the points covered in the questionnaire:

A. COST DATA

1. Whether costing records of the fertilizer factory is satisfactory.
2. Whether there was any scope for material being used wastefully.
3. Whether there was any scope for material being pilfered.

4. Whether there was any scope for reducing purchase price of materials through more effective purchase policy and procedure.

5. Whether there was any substitute materials which can be obtained at a lower cost.

6. Whether workers in the factory were very much careful in the use of materials.

7. Whether supervisors in the factory were alert to ensure that no loss of material occurs.

8. Whether factory supervisors were very much interested to ensure proper utilization of labour for keeping the cost down.

9. Whether heads of departments were very much careful in the proper utilization of office manpower for keeping the cost to the minimum.

10. Whether sincere effort was made to minimise overtime work.

11. Whether engineering department was very much careful in keeping the repair and maintenance expenses of the office equipments, buildings, transport vehicles and factory plants and machines to the minimum.

12. Whether transport/traffic department were very much careful to keep use of fuel expenses to the minimum.

13. Whether every body sincerely tried to keep the cost of electricity to the minimum.

14. Whether staffs in the office were very much careful in the use of office stationery.

15. Whether enterprise head was very much interested in keeping the overhead expenses to the minimum.

16. Whether inventory management, stock taking and recording of incoming and outgoing spareparts and tools were quite effective for cost control purposes.

17. Whether office heads were interested in keeping the cost of drugs to the minimum.

18. Whether costs of fertilizer factories could reduce if a system of cost audit was introduced.

19. Whether budget was used for effectively controlling costs.

20. Whether expenditures on various heads were timely compared with the budgeted expenditures to take remedial action.

B. COST REDUCTION

1. Whether cost of raw materials could be reduced.

2. Whether cost of chemicals could be reduced.

3. Whether cost of packing materials could be reduced.

4. Whether salaries and wages of workers could be reduced.

5. Whether salaries and wages of staffs could be reduced.

6. Whether salaries and wages of officers could be reduced.

7. Whether factory overhead could be reduced.

8. Whether administrative overhead could be reduced.

9. Whether selling and distribution overhead could be reduced.

The above questionnaire was given to 100 different concerned persons for reply. But 74 persons responded. They were classified as follows:

Accounts Executives	-	49
Non-Accounts Executives	-	25
Total Respondents:	-	74

The factory-wise respondents were shown in Table-7.01.

Table - 7.01

Fertilizer Industry of Bangladesh
Summary of the Respondents

Particulars	NGFF	UFFL	TSPC	ZFCL	Total
A. Accounts Executives	6	10	12	21	49
B. Non-Accounts Executives	7	3	7	8	25
C. Total Respondents (A+B)	13	13	19	29	74

Notes: NGFF = Natural Gas Fertilizer Factory Limited
UFFL = Urea Fertilizer Factory Limited
TSPC = Triple Superphosphate Complex Limited
ZFCL = Zia Fertilizer Company Limited

The accounts executives were:

Designation	Nos.
Chief Accountant	3
Additional Chief Accountant	5
Deputy Chief Accountant	12
Assistant Chief Accountant	7
Accounts Officer	22
Total Accounts Executives :	49

And the non-accounts executives were enterprise heads, departmental heads and section heads.

The list of respondents is shown as follows (Table-7.02):

Table - 7.02

List of Respondents

Designations	NGFF	UFFL	TSPC	ZFCL	Total
A. Accounts Executives:					
Chief Accountant	-	1	1	1	3
Additional Chief Accountant	1	-	1	3	5
Deputy Chief Accountant	1	3	2	6	12
Asstt. Chief Accountant	1	2	1	3	7
Accounts Officer	3	4	7	8	22
	6	10	12	21	49

Contd....

Table-7.02 continued

Designations	NGFF	UFFL	TSPC	ZFCL	Total
B. Non-Accounts Executives:					
Managing Director	-	-	-	1	1
General Manager	1	-	-	1	2
Deputy General Manager	1	-	-	-	1
Manager	-	-	1	-	1
Additional Chief Administrative Manager	-	-	1	1	2
Chief Operation Manager	-	1	1	-	2
Additional Chief Operation Manager	1	-	-	1	2
Chief Commercial Manager	-	1	-	1	2
Chief Engineer	1	-	-	1	2
Additional Chief Engineer	-	-	1	-	1
Deputy Chief Engineer	1	-	-	-	1
Assistant Chief Engineer	-	-	-	1	1
Chief (MPIC)	-	1	-	-	1
Chief (Utility Plant)	-	-	-	1	1
Deputy Chief Chemist	2	-	-	-	2
Chemist	-	-	2	-	2
Assistant Chemist	-	-	1	-	1
	7	3	7	8	25
C. Total Respondents (A+B):	13	13	19	29	74

The particulars covering qualifications, experiences, and training of the respondents from different fertilizer factories are shown separately. Such as:

1. Natural Gas Fertilizer Factory Limited, (Appendix-7.02)
2. Urea Fertilizer Factory Limited, (Appendix-7.03)
3. Triple Superphosphate Complex Limited, (Appendix-7.04).
4. Zia Fertilizer Company Limited, (Appendix-7.05).

Opinions of the respondents to the questionnaire have been shown in tabular and narrative forms in Table-7.03.

Table - 7.03

Opinions of the respondents to the questionnaire in tabular and narrative form

	No. of respondents	%
A. COST DATA		
1. Costing records is satisfactory:		
a) Strongly agree	15	20
b) Agree	54	73
c) Uncertain	5	7
d) Disagree	-	-
e) Strongly disagree	-	-
	74	100

Contd....

	No. of respondents	%
2. No scope for material used wastefully:		
a) Strongly agree	3	4
b) Agree	25	34
c) Uncertain	21	28
d) Disagree	24	33
e) Strongly disagree	1	1
	74	100
3. No scope for material pilfered:		
a) Strongly agree	6	8
b) Agree	23	31
c) Uncertain	23	31
d) Disagree	21	29
e) Strongly disagree	1	1
	74	100
4. Scope for reducing purchase price of materials:		
a) Strongly agree	19	26
b) Agree	44	60
c) Uncertain	4	5
d) Disagree	6	8
e) Strongly disagree	1	1
	74	100

Contd.....

Table-7.03 continued

	No. of respondents	%
5. Substitute materials can be obtained at a lower cost:		
a) Strongly agree	9	12
b) Agree	27	37
c) Uncertain	21	28
d) Disagree	15	20
e) Strongly disagree	2	3
	74	100
6. Workers are careful in the use of materials:		
a) Strongly agree	10	14
b) Agree	43	58
c) Uncertain	10	13
d) Disagree	11	15
e) Strongly disagree	-	-
	74	100
7. Supervisors are alert to ensure that no loss of material occurs:		
a) Strongly agree	7	10
b) Agree	51	69
c) Uncertain	8	11
d) Disagree	7	9
e) Strongly disagree	1	1
	74	100

Table-7.03 continued

	No. of respondents	%
8. Factory supervisors are interested to ensure utilization of labour:		
a) Strongly agree	9	12
b) Agree	39	53
c) Uncertain	15	20
d) Disagree	11	15
e) Strongly disagree	-	-
	74	100
9. Heads of departments are careful in the proper utilization of manpower:		
a) Strongly agree	23	31
b) Agree	44	60
c) Uncertain	6	8
d) Disagree	1	1
e) Strongly disagree	-	-
	74	100
10. Effort is made to minimise over-time work:		
a) Strongly agree	12	16
b) Agree	37	50
c) Uncertain	12	16
d) Disagree	10	14
e) Strongly disagree	3	4
	74	100

Table-7.03 continued

	No. of respondents	%
11. Engineering department is careful in the repair and maintenance of office equipments, buildings, transport vehicles and factory plants and machines:		
a) Strongly agree	6	8
b) Agree	42	57
c) Uncertain	19	26
d) Disagree	7	9
e) Strongly disagree	-	-
	74	100
12. Transport/Traffic department are carefull of fuel expenses:		
a) Strongly agree	4	6
b) Agree	35	47
c) Uncertain	18	24
d) Disagree	14	19
e) Strongly disagree	3	4
	74	100
13. Every body tries to keep the electricity cost to the minimum:		
a) Strongly agree	5	7
b) Agree	37	50
c) Uncertain	15	20
d) Disagree	16	22
e) Strongly disagree	1	1
	74	100

Table-7.03 continued

	No. of respondents	%
14. Staffs are careful in the use of office stationery:		
a) Strongly agree	1	2
b) Agree	51	69
c) Uncertain	9	12
d) Disagree	12	16
e) Strongly disagree	1	1
	74	100
15. Enterprise head is interested in keeping the overhead expenses to the minimum:		
a) Strongly agree	40	54
b) Agree	32	43
c) Uncertain	2	3
d) Disagree	-	-
e) Strongly disagree	-	-
	74	100
16. Inventory management, stock taking and recording of incoming and outgoing spare parts and tools are effective:		
a) Strongly agree	9	12
b) Agree	47	63
c) Uncertain	8	11
d) Disagree	8	11
e) Strongly disagree	2	3
	74	100

Table-7.03 continued

	No. of respondents	%
17. Office heads are interested in keeping the cost of drugs to the minimum:		
a) Strongly agree	13	18
b) Agree	47	63
c) Uncertain	13	18
d) Disagree	1	1
e) Strongly disagree	-	-
	74	100
18. Cost can be reduced if system of cost audit is introduced:		
a) Strongly agree	26	35
b) Agree	30	41
c) Uncertain	8	11
d) Disagree	7	9
e) Strongly disagree	3	4
	74	100
19. Budget is used for controlling costs:		
a) Strongly agree	24	32
b) Agree	41	55
c) Uncertain	7	10
d) Disagree	2	3
e) Strongly disagree	-	-
	74	100

Table-7.03 continued

	No. of respondents	%
20. Actual expenditures are compared with the budgeted expenditures to take remedial action:		
a) Strongly agree	15	20
b) Agree	52	70
c) Uncertain	3	4
d) Disagree	4	6
e) Strongly disagree	-	-
	74	100
B. COST REDUCTION		
1. Cost of raw materials can be reduced:		
a) 0%	27	36
b) 5%	34	46
c) 10%	8	11
d) 15%	2	3
e) More than 15%	3	4
	74	100
2. Cost of chemicals can be reduced:		
a) 0%	25	34
b) 5%	37	50
c) 10%	8	11
d) 15%	1	1
e) More than 15%	3	4
	74	100

Table-7.03 continued

	No. of respondents	%
3. Cost of packing materials can be reduced:		
a) 0%	24	33
b) 5%	43	58
c) 10%	4	5
d) 15%	2	3
e) More than 15%	1	1
	74	100
4. Salaries and wages of workers can be reduced:		
a) 0%	46	62
b) 5%	13	18
c) 10%	7	9
d) 15%	2	3
e) More than 15%	6	8
	74	100
5. Salaries and wages of staffs can be reduced:		
a) 0%	45	61
b) 5%	17	23
c) 10%	4	5
d) 15%	2	3
e) More than 15%	6	8
	74	100

Table-7.03 continued

	No. of respondents	%
6. Salaries and wages of officers can be reduces:		
a) 0%	47	64
b) 5%	16	22
c) 10%	3	4
d) 15%	1	1
e) More than 15%	7	9
	74	100
7. Factory overhead can be reduced:		
a) 0%	13	18
b) 5%	43	58
c) 10%	17	23
d) 15%	-	-
e) More than 15%	1	1
	74	100
8. Administrative overhead can be reduced:		
a) 0%	11	15
b) 5%	39	53
c) 10%	22	30
d) 15%	1	1
e) More than 15%	1	1
	74	100

	No. of respondents	%
9. Selling and distribution overhead can be reduced:		
a) 0%	32	43
b) 5%	33	45
c) 10%	7	9
d) 15%	-	-
e. More than 15%	2	3
	74	100

The executives were also requested to suggest actions for controlling and reducing costs. The suggestions offered have been categorised as follows:

Category of Action Suggested	N = 74
1. MATERIALS	
a) Avoidance of unnecessary purchase.	16
b) Introduction of perpetual inventory system.	8
c) Making of inventory management proper and scientific.	15
d) Proper controlling of usages ratio.	27
e) Prevention of wastage of gas, water, electricity, etc.	24
f) Procurement of stores, spares, chemicals etc. on a competitive basis.	31
g) Obtention of suitable substitute packing materials for minimizing the cost.	7

Contd...

Category of Action Suggested	N = 74
h) Purchase of packing materials from private mills on a competitive basis.	3
i) Placement of orders for imports after due consideration of lead time.	6
j) Arrangement of foreign currency for quick payment for the imported items, in order to reduce the cost.	6
2. LABOUR	
a) Placement of right man in the right position	7
b) Introduction of proper administrative control	10
c) Development of managerial and technical skill	11
d) Making manpower free from political influence	4
e) Improvement of law and order situation for controlling manpower.	10
f) Reduction of manpower as far as possible.	10
g) Making maximum use of manpower.	17
h) Generation of cost consciousness through seminars and discussions.	12
i) Exercise of proper control on overtime.	16
j) Provision for recognition of merit in all sphere by introducing award system.	4
3. OVERHEAD	
a) Imposition of proper control over different kinds of overheads, such as:	19
i) Factory overhead	4
ii) Administrative overhead	6
iii) Selling and distribution overhead	3
iv) Research and development cost	3
b) Reduction of the amount of interest burden by making timely repayment of foreign and local loans.	4

Category of Action Suggested	N = 74
4. GENERAL	
a) Acceleration of the operation process.	12
b) Making the budgetary control and standard costing system effective.	12
c) Enhencement of production for lowering the cost.	6
d) Modernization of factory technology.	6
e. Minimization of down-time as far as practicable.	17
f. Introduction of cost audit system.	6
g. Improvement of capital gearing ratio.	5
h. Making arrangement with the authorities concerned for overseas payment of arears avoiding adverse effect (i.e. depreciation and interest cost) of devaluation if any, in the country.	7
i) Arrangement for timely lifting of fertilizer.	9
j) Establishment of a central workshop under BCIC to fabricate spare parts, equipments etc.	5

From the opinions and suggestions of the executives, it transpires that :

1) Fertilizer factories at least at times purchase unnecessary materials and inputs.
2) Inventory control is loose.
3) Lack of scientific approach to the inventory management.
4) Absence of proper usage ratio.
5) Gas, electricity and water etc. are on wastage.
6) Procurement of stores, spares, chemicals etc. are not on competitive basis.
7) Absence of procurement of suitable substitute packing materials.

8. Packing materials are not purchased from private mills on a competitive basis.

9. Lead time was not properly considered in the placement of orders for imports.

10. Foreign currency was not arranged timely for repayment of overseas loans.

11. Right man has not been placed in the right position in all cases.

12. Absence of proper administrative control.

13. Absence of adequate managerial and technical skill.

14. There is political influence in the factory.

15. Law and order situation is inadequate in the factory.

16. Manpower seems to be surplus.

17. There is no maximum use of manpower.

18. Lack of cost consciousness is prevailing.

19. There is no proper control on overtime.

20. The award system for recognition of merit is inadequate.

21. Lack of proper control over different kinds of overhead expenses, such as:

    a) Factory overhead;

    b) Administrative overhead

    c) Selling and distribution overhead; and

    d) Research and development cost.

22. Local and foreign loans are not repaid properly to reduce interest burden.

23. Operation process is not accelerating properly.

24. Budgetary control and standard costing system is ineffective.

25. There is no proper system for enhancing production.

26. Factory technology is not adequately modernized.

27. There is no adequate measure to minimize the down-time.

28. There is no cost audit system.

29. There is no sufficient measure for capital gearing ratio.

30. Proper measures have not yet been taken to avoid adverse effect of devaluation on overseas repayments of loan.

31. Lifting of fertilizer is not proper.

32. There is no proper workshop for fabricating spares, equipments etc.

CHAPTER - VIII

INTERNAL AUDIT AS A MEASURE OF COST CONTROL

Internal audit is an important part of internal control system and it is one of the constituents of accounting control.[1] Previously the term internal audit had been used in a restricted sense and was confined only to the protection of business assets and examination and verification of day to day accounting records by a staff of auditors functioning as full-time salaried employees.

With the growth in size and complexity of many companies in recent years, the importance of the internal audit has been correspondingly increased so that it is today a major factor in establishing the quality of a company's internal control and its development has made a considerable contribution to contemporary audit practice. But now the concept has been widely used and defined and has progressed in becoming an integral part of the management team.[2] The modern concept of audit goes much beyond the statutory requirement. The concept of auditing has been rightly defined by Professor B.K. Basu that auditing can be defined as accounting control.[3]

So, more comprehensive definition of the term 'internal auditing' with the emphasis on management control can be defined as "Internal auditing is a series of process and techniques through which an

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1. Basu, B.K., An insight into Auditing, (Calcutta: Book Syndicate Private Limited, 1982), p.16.1.
2. Institute of Internal Auditors, Survey of Internal Auditing, 1968, Research Committee Report No. 15, (New York: 1969).
3. Basu, B.K., Lectures on Management Accountancy, (Calcutta: Chatterjee Publishing Concern, 1979), p.693.

organisation's own employees ascertain for management, by means of first-hand, on-the-job observation. Whether established management controls are adequate and are effectively maintained; records and reports - financial, accounting and otherwise reflect actual operations and results accurately and promptly; each division, department or other unit is carrying out the plans, policies and procedures for which it is responsible".[4]

The objectives of internal and external auditing are similar, except that the internal auditors are employees of the company and are responsible to its management.[5] The function of an internal auditor is practically the same as that of an external auditor. In addition to that an internal auditor has to see that there is no wastage and the business is carried on efficiently. Again if an internal auditor finds that as a result of the inefficiency of the management, the concern has suffered loss, it is his duty to report that fact.[6] According to A.W. Holmes,[7] the internal auditor establishes and appraises financial and operating procedures, reviews financial records and accounting and operating procedures, evaluates the system of internal control, periodically summarizes the results of the continuous investigation, prepares recommendations for better procedures, and reports the results of his findings to the top management. As representatives of top management, the internal auditors are interested in determining

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4. Walsh Jr., Internal Auditing, Business Policy Study No. III, (USA: National Industrial Conference Board Inc., 1963).
5. Woolf, Emile, Auditing Today, (Englewood Cliffs; Prentice Hall International, 1982), p.86.
6. Tandon, B.N., Practical Auditing, (New Delhi: S. Chand & Company Ltd., 1985), p.30.
7. Holmes, Arthur W., Basic Auditing Principles, (Homewood; Richard D. Irwin, Inc., 1970), p.3.

whether each branch or department has a clear understanding of its assignment, whether it is adequately staffed, maintains good records, protects cash and inventories and other assets properly, cooperates harmoniously with other departments, and in general carries out effectively the functions provided for in the overall plan and organization of the business.[8] He has to report to the management whether the policy and plans of activities prescribed by them have been implemented; whether the internal controls and checks established were adequate; whether the actual results obtained were varying from the budgeted etc. for the betterment of the concern i.e. to get the maximum results at a minimum cost.

According to Rahman and Halladay,[9] Internal Accounting Control (IAC) consists of the routine accounting procedures set up by management to safeguard assets and ensure reliable recording of financial transactions. Hence, internal auditors provide a higher level of internal accounting control, they design and carry out audit procedures that test the efficiency of virtually all aspects of company operations. That is why a group of American Professors[10] argued that to what extent they were successful, the internal auditors strengthened the effectiveness of the system of internal control.

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8. Meigs, Walter B., Whithington, O. Ray, and Meigs, Robert F., Principles of Auditing, (Homewood: Richard D. Irwin Inc., 1982), p.143.

9. Rahman, Mawdudur, and Halladay, Maurice, Accounting Information Systems : Principles, Applications, and Future Directions, (New Jersey; Prentice Hall, 1988), p.380.

10. Hermanson, Roger H., Leeb, Stephen E., and Strawser, Robert H., Auditing Theory and Practice, (Homewood: Richard D. Irwin, Inc., 1983), p.184.

The sum and substance of the discussions, so far made is that the internal auditor has to make suggestions to the management as to how to run the business efficiently and effectively, to avoid wastages, the internal auditor acts as a watch-dog, for ascertaining that there is a good system of accounting which provides information which is necessary for preparing true and fair financial statement and to prevent and detect errors and frauds for cost control and cost reduction purposes.

REVIEWAND ANALYSIS OF THE INTERNAL AUDIT SYSTEMS IN THE ZFCL

Review and analysis of the management weakness pointed out by the internal audit report of one of the selected fertilizer factories covering three years. Some of the questions raised by the internal auditors could be explained by the concerned managers on being asked, but majority of the questions the managers could not give satisfactory report to the auditors.

There is a separate audit department in the BCIC's head quarter to perform internal audit work for its enterprises. The audit department is a separate division controlled by the Director (Finance).

For easy and better understanding, explaining and co-ordinating of the audit querries and replies of the internal audit reports and to make necessary action plan, Bengali Language is used on, perhaps since 1976.

Here the researcher reviewed the internal audit reports of the Zia Fertilizer Company Limited as a sample basis.

It is the usual practice of the BCIC to conduct the internal audit work after the completion of the financial period but prior to external audit work. The internal audit team as per instruction of the head office audited the enterprise concerned and reported to the enterprise head with a copy to the BCIC head office. The enterprise concerned after getting the audit querries replied accordingly.

The period of internal audit, number of querries, memo and date of BCIC head office and the factory concerned may be presented in a tabular form (Table-8.01).

The internal audit report of the Zia Fertilizer Company Limited for the above mentioned period disclosed that there were many irregularities, misuse of assets and inventories which caused a raise in the production cost. Without internal audit work, these Loopholes could not have been detected. The internal auditor as a watch-dog can minimise these and control cost provided the management is serious in removing or reducing the irregularities mentioned in the internal audit reports and takes steps accordingly. There is evidence that management has tried to reduce the frequency and seriousness of the irregularities for the purpose of reducing the cost. The frequency has been showing a decreasing trend.

Table - 8.01

Statement showing the Internal Audit of
Zia Fertilizer Company Limited

Period of Audit	Nos. of Querries	Head Office Memo	Reply by the Factory
December, 1983 to December, 1984	62 Appendix-8.01	Audit Department 311.08(1) 705 dt. 13.10.86	ZFCL/Int.Audit/005 /126 dt. 2.9.87
Janua , 1985 to June, 1985	38 Appendix-8.02	Audit Department 311.08(2)/689 dt. 1.10.87	ZFCL/Int.Audit/005/178 dt. 26.4.88
July, 1985 to December, 1985	25 Appendix-8.03	Audit Department 311.08(3)/409 dt. 22.6.87	ZFCL/Int.Audit/005/138A dt. 9.11.87
January, 1986 to June, 1986	40 Appendix-8.04	Audit Department 311:08(4)89 dt. 12.1.88	Yet to receive

CHAPTER - IX

FINDINGS AND CONCLUSIONS

The analysis of the eight hypotheses may be presented chronologically:

1. In this study the cost of production of fertilizer per metric ton had been increasing year after year despite the commitment of the government to ensure distribution of fertilizer among the farmer at a reasonably fair price. The data supported this hypothesis. In the selected fertilizer factories, cost of production of different kinds of fertilizer viz. Urea, TSP, and Ammonium Sulphate is increasing though there are some minor exceptions. The trend of increasing cost of production of different kinds of fertilizer produced in different fertilizer factories may be shown below (Table-9.01).

2. Acceptance and use of cost control and cost reduction techniques like Budgetary Control and Standard Costing by enterprise personnel is half hearted and ineffective rather than systematic and well designed. The data supported this hypothesis. Though budgets are prepared before the commencement of the financial year of the selected fertilizer factories but the budgets, it has been observed in actual practice, are subject to revision before the end of the financial year.

Table - 9.01

Statement showing the cost of production of different kinds of fertilizer in different factories

(Cost per metric ton in Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86
A. Urea:					
NGFF	2,307.73	2,576.98	2,636.58	3,107.39	4,354.94
UFFL	1,809.37	1,599.06	1,759.45	2,362.93	2,201.18
ZFCL	Commissioned on 1983-84		3,689.84	3,301.10	4,071.36
B. TSP:					
TSPC	6,292.32	6,281.15	6,203.27	6,888.23	7,396.91
C. Ammonium Sulphate:					
NGFF	2,684.42	2,647.70	2,591.55	3,170.13	4,252.10

Reference: Table-4.10.

In many cases dissimilarity between the budget and the revised budget has been observed. Under the circumstances, a question may peep through in the mind of general public as to whether, the revised budget is prepared to minimise the unfavourable variances to avoid public criticism. That is why the researcher finds that though there is a budgetary control system in existence yet the same is not found effective and well designed. Similarly, Standing Costing is not followed properly and elementwise. Both the Budgetary Control and Standard Costing techniques for controlling and reducing cost, if used in a systematic and well designed manner, will automatically gives us the planned results.

a. Cost control measures like Value Analysis and Suggestion Scheme widely used in the mature economies have not received any mentionable recognition in Bangladesh fertilizer factories. In the Value Analysis System, the data did not show any significant indication to support this hypothesis concerned. Value Analysis system is practiced in the sample factories e.g. packing materials is produced at the plant itself. The decision, whether jute bag or synthetic bag should be manufactured or bought, depends on value analysis, is practised.

The suggestion scheme as referred to above supported the hypothesis, based on observation and data collection is that workers, supervisors and executives do not bother for any suggestions. Fertilizer factories are automated and there is limited scope of suggestion scheme.

b. Break-Even Analysis is not used as a cost control device meaningfully. The data supported this hypothesis. The management is not concerned with break-even analysis rather they move with target of production. Investigation by the researcher discloses that for many years National Gas Fertilizer Factory, Urea Fertilizer Factory Limited and Zia Fertilizer Company Limited produced above the Break-Even point and earned profit but Triple Superphosphate Complex Limited produced below the Break-Even point and sustained loss. In our country, right from the farmers to leaders are always interested to increase fertilizer production. Though there is a demand for fertilizer but production was not satisfactory. It caused production below the Break-Even point. If

there will be a Break-Even Point production by which we can control cost accordingly.

c. Cost planning through efficient and effective procurement of production inputs is lacking i.e. five P's of procurement are not followed strictly though there is a full-fledged department of Material Planning and Inventory Control (MPIC). The data indicated evidence of support for this hypothesis. In the matter of procurement of materials and inputs, the five P's of efficient procurement namely - purchase of right input at the right price from the right source, at the right time and in right quantity is not given due consideration.

d. Principles of efficient Material Planning viz. Minimum Limit, Maximul Limit and Re-ordering level is not maintained properly. The data indicated support for this hypothesis. Inspite of repeated instructions from external auditor to take into account Minimum Limit, Maximum Limit, Re-ordering Limit in Store Bin Card of one of the selected fertilizer factories, no action has yet been taken into consideration.

e. While placing orders for purchase of imported inputs, lead time is not considered carefully. There was evidence to support this hypothesis. It was found that the Triple Superphosphate Complex Limited, the only fertilizer factory was dependent on imported raw materials resulting in production stoppage for non-availability of imported materials. This indicates that at the time of import orders lead time was not considered carefully.

f. While purchasing inputs from domestic market, there was a tendency for emergency purchase at cash which raised purchase price. The data supported this hypothesis. It was found that there was a tendency for emergency purchase at cash which gave the personal gain of the personnel and which in turn raises purchase price.

g. While purchasing inputs Economic Order Quantity (EOQ) is not considered. This evidence appears from the earlier analysis. In all of the fertilizer factories under study some were not utilizing the benefit of Economic Order Quantity by which one could get maximum quantity with minimum carrying and other costs.

h. Perpetual Inventory system and Always Better Control (ABC) system for materials, work in progress and finished stock was not used properly. This hypothesis is supported by earlier analysis.

i. Management of inventory items such as stores, spares and accessories and finished goods is weak, which raises the cost and adversely affects profitability of fertilizer factories. The data indicated support for this hypothesis. Stores, spares and accessories and finished goods required proper inventory unless pilferage, theft, misuse etc. which raise cost and adversely affected profitability. Only proper management of inventory can give us fruitful results.

3. There is no system of cost audit in Bangladesh. The introduction of which may reduce their costs. This hypothesis is supported by the discussion made earlier. The government of India prescribed the cost audit as compulsory by amending the Companies Act with the object to detect error, fraud, misappropriation and to help the management in prescribing procedures and rules to prevent and reduce the chances of irregularities. The policy makers in the enterprises should think over the matter and now it is on the government to get the required legal sanction for cost audit.

4. Costs are not segregated into fixed and variable categories though it was done several years ago. This hypothesis is derived from discussions so far made earlier. The Bangladesh Chemical Industries Corporation since its inception costs are presented into itemwise and continued upto 1980-81, from 1981-82 to 1984-85 costs are classified into fixed and variable categories, and from the year 1985-86 costs are grouped into Material Cost, conversion cost, manufacturing cost and so on.

5. Overhead expenditures are not subjected to scrutiny and analysis for exploring the scope for cost reduction. Our data indicated that a successful scrutiny and analysis can give us scope for cost reduction in factory overhead, administrative overhead and also in the selling and distribution overhead. In producing Urea fertilizer Natural Gas Fertilizer Factory Limited reduced its factory overhead to the lowest, Urea Fertilizer Factory Limited reduced its administrative overhead to the lowest, and

Zia Fertilizer Company Limited reduced its selling and distribution overhead to the lowest among the other fertilizer factories.

6. Responsibility accounting is not enforced and the various expenses of the factory are not properly grouped into suitable cost centre. The data did not indicate any definite association. In the factory level, each factory is divided into various department, each department may be called individual cost centre and again each department or cost centre is controlled by the departmental head who is responsible for his department. So, we can say, responsibility accounting is enforce in the enterprises and also in the corporation's head quarter.

7. Emphasis on production alone, neglecting marketing which promotes inventory build up of finished goods also increases interest cost. There was evidence to support this hypothesis. It was found that sometimes production was stopped due to non-lifting of finished goods which increased cost of production and on the other hand increased interest cost of the working fund.

8. Cost consciousness among the people employed and connected with the fertilizer industry in Bangladesh has not been developed. The data indicated to support this hypothesis. There was no evidence that people in the fertilizer industry in general gave top most priority to economic benefits and cost savings.

CONCLUSIONS

In the conclusion it can be stated that fertilizer industry is the premier manufacturing industry of Bangladesh, and has a key position in her national economy. But, although the area constituting Bangladesh has for long been a reserve of natural gas, water, i.e. raw materials for fertilizer, its fertilizer manufacturing industry was established only after 1960. The industry was set up in Bangladesh (then East Pakistan) as a domestic industry, and it was intended progressively to be replaced as an export industry also Fertilizer has been the largest argicultural input for the country in the past and is still the dominant input and the market is in domestic and abroad. In this, the achievements of two and a half decades in the face of major problems such as foreign exchange difficulties and the lack of entrepreneurs. The present capacity of the industry is about 1800 thousand metric tons, capable of satisfying the home demand and exporting to earn foreign currency.

The success achieved by Bangladesh in expanding her production capacity. The success was not the result of a greater degree of competitiveness of the fertilizer manufacturing industry of Bangladesh.

Capacity utilisation and production cost per metric ton were found to have been generally the more important determinants. Prices of inputs of the industry increased substantially in the period after Liberation. As production costs in UFFL is substantially lower than NGFF and ZFCL for the mentioned five years for producing Urea fertilizer. While all the factories operated under very similar economic

environment in each year it would seem that there was scope for reducing costs in factories with performances towards the upper end of the cost scale relatively easily, without having to undertake a thorough industrial reorganisation.

Analyses of cost-output relationships have not included capital costs, which in any case account for a small proportion of the cost of production of fertilizer. No conclusive evidence one way or other regarding economies of scale in the industry has emerged from this study. We must be really cost conscious if we desire optimum result in terms of production and production cost from the industry out of this competitive situation.

In the present form of financial audit, the accuracy and fairness of the financial statements prepared are validated and the conventional Balance Sheet and Profit and Loss Account do not give complete picture of the efficiency of management in running a plant or an organisation. It however, fails to give us the clear information about cost and cost information. The need for both cost accounting and cost audit were more pronounced with the increasing rate of industrialization. It is for this reason that in some of the countries in the world, the importance of a separate Cost Audit has been recognized. In the neighbouring country of India, the government prescribed the Cost Audit and has made cost records as compulsory by amending Companies Act. An effective Cost Audit plan, if implemented in our fertilizer industry as well as public sector industries, can of course help in this competitive situation.

The present study is intended as a step in gaining an insight into the dynamic workings of the world fertilizer economy with special emphasis on Bangladesh. The present study also brings about some interesting features about cost control and cost reduction functions of fertilizer industry in Bangladesh. One advantage of this approach to policy making is that it places the analysis in a dynamic setting and provides an initial framework for policy analysis.

It is suggested that occasionally the working of the fertilizer factories should be reviewed to find out the ways and means to reduce cost of production. Such reviews should examine how management of fertilizer factories perceives its planning, organizing, directing, co-ordinating and controlling functions for different manufacturing processes. This will allow a more comprehensive model to project the cost structure before hand which could be used for policy simulation. Interfirm comparison is also suggested for better cost control and cost reduction in the factories, and for that, award of reward to good performers should be provided.

Finally, it may be a judicious policy for a highly capital intensive and high technology oriented fertilizer industry to organize occasionally seminars with participants from developed and developing countries around Bangladesh. Such conferences may provide a forum for exchange of thoughts and cross fertilization of ideas and Bangladesh Fertilizer Industry is likely to be benefited in the areas of cost effectiveness.

A P P E N D I C E S

Appendix - 3.01

Statement showing fertilizer production in Bangladesh for the last ten years (1976-77 to 1985-86)

(Quantity in MT)

Particulars	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
A. Urea:						
NGFF	77,446	61,427	54,637	1,04,594	99,201	92,542
UFFL	2,08,075	1,51,037	2,36,123	2,56,612	2,45,482	2,52,863
ZFCL	-	-	-	(Commission in 1983-84)		62,495
PUFF	-	-	-	-	-	-
	2,85,521	2,12,464	2,90,760	3,61,206	3,44,683	4,07,900
B. TSP:						
TSPC	38,006	41,274	62,287	71,118	71,461	57,888
C. Ammonium Sulphate:						
NGFF	9,261	9,553	5,325	9,852	9,860	11,566
D. Total (A+B+C):	3,32,788	2,63,291	3,58,372	4,42,176	4,26,004	4,77,354

Contd.....

Appendix-3.01 continued

Particulars	1982-83	1983-84	1984-85	1985-86	Total
A. Urea:					
NGFF	87,166	88,044	95,282	80,314	8,40,653
UFFL	2,83,844	2,57,164	2,31,744	3,06,690	24,29,634
ZFCL	1,38,242	3,79,039	4,14,528	4,25,329	14,19,633
PUFF	-	(Commission in 1985-86)		29,944	29,944
	5,09,252	7,24,247	7,41,554	8,42,277	47,19,864
B. TSP:					
TSPC	68,603	81,243	55,192	1,00,758	6,47,830
C. Ammonium Sulphate:					
NGFF	12,282	11,027	9,634	10,004	98,364
D. Total (A+B+C):	5,90,137	8,16,517	8,06,380	9,53,039	54,66,058

Notes: NGFF = Natural Gas Fertilizer Factory Limited.
UFFL = Urea Fertilizer Factory Limited.
ZFCL = Zia Fertilizer Company Limited.
TSPC = Triple Superphosphate Complex Limited.
PUFF = Polash Urea Fertilizer Factory.

Sources:
1. Annual Reports, Natural Gas Fertilizer Factory Limited, Fenchuganj, Sylhet, 1983-84, 1984-85, 1985-86.
2. Annual Reports and Accounts, Urea Fertilizer Factory Limited, Ghorasal, Narsingdi, 1985-86.
3. Annual Reports, Zia Fertilizer Company Limited, Ashugonj, Brahmanbaria, 1983-84, 1984-85, 1985-86.
4. Annual Reports, Triple Superphosphate Complex Limited, North Potenga, Chittagong, 1983-84, 1984-85, 1985-86.
5. Annual Reports, Bangladesh Chemical Industries Corporation, Dhaka, 1976-77, 1977-78, 1978-79, 1979-80, 1980-81, 1981-82, 1982-83, 1983-84, 1984-85, 1985-86.
6. Ten Years of BCIC, Dhaka.

List of Directors showing the Boards of four selected enterprises.

Natural Gas Fertilizer Factory Limited		Urea Fertilizer Factory Limited	
1. Mr. Giasuddin Ahmed Director (Tech. & Engg.) BCIC.	Chairman	1. Mr. Mohammad Toha Director (Finance) BCIC	Chairman
2. Mr. S. A. Salik Deputy Secretary Ministry of Industries Government of Bangladesh	Director	2. Mr. G. A. Motin Secretary BCIC	Director
3. Mr. M. M. Eunus Managing Director Jamuna Fertilizer Project	Director	3. Mr. M. M. Eunus Managing Director Jamuna Fertilizer Project	Director
4. Mr. Z. U. Ahmed Chief of Personnel BCIC	Director	4. Mr. M. A. Hamid Managing Director PUFF	Director
5. Mr. Hasanul Murshed General Manager NGFF	Director	5. Mr.Md. Siddiqure Rahman Sr. Gen. Manager (Prod.) BCIC	Director
6. Mr. M. A. Sahid Chief, FMC BCIC	Director	6. Mr. Ekramul Haque Khandaker Managing Director UFFL	Director
7. Mr. A. R. Mollah Chief Auditor BCIC	Director		

Contd.....

Appendix-4.01 continued

Triple Superphosphate Complex Limited		Zia Fertilizer Company Limited	
1. Mr. Giasuddin Ahmed Director (Tech. & Engg.) BCIC	Chairman	1. Mr. A.K.M. Mosharraf Hossain Chairman BCIC	Chairman
2. Mr. G. A. Motin Secretary BCIC	Director	2. Mr. Mohammad Toha Director (Finance) BCIC	Director
3. Mr. K. R. Karim Ex-Executive Director TSPC	Director	3. Mr. Giasuddin Ahmed Director (Tech. & Engg.) BCIC	Director
4. Mr. K. M. Hossain Sr. Gen. Manager (Pur.) BCIC	Director	4. Mr. Mofazzel Hossain Deputy Secretary External Resources Division Ministry of Finance Government of Bangladesh	Director
5. Mr. Lutfur Rahman Sr. Gen. Manager Branch Office BCIC	Director	5. Mr. A.B.M. Saleh Jahur Deputy Secretary Ministry of Industries Government of Bangladesh	Director
6. Dr. Shafiqur Rahman Managing Director TSPC	Director	6. Mr. A. Momin Managing Director CUFF	Director
7. Mr. A.F.M. Badiur Rahman MOI	Director	7. Mr. S.A.S.S. Alam Managing Director ZFCL	Director

Sources : 1. Natural Gas Fertilizer Factory Limited, Annual Report 1986-87, (Fenchugonj), p.9.

2. Urea Fertilizer Factory Limited, Annual Report 1986-87. (Ghorasal), p.4.

3. Triple Superphosphate Complex Limited, Annual Report 1986-87,(Chittagong),p.11.

4. Zia Fertilizer Company Limited, Annual Report 1986-87, (Ashugonj), p.3.

Appendix - 4.02

BUDGET ANALYSIS OF NGFF (1983-84):

The Unit-wise (i.e. Urea & Ammonium Sulphate Plant) comparative statement of budget and actual usage for the year 1983-84 has been noted below:

UREA PLANT

Taka in Lacs

Particulars	As per Budget	Flexible	Actual	Variance	Favourable/ Unfavourable
	85,000 MT	88,044	88,044 MT		(F/U)
Income:					
Sales of Urea	2,931.65	3,036.63	2,214.96	(-) 821.67	U
Misc. Income	6.00	6.21	9.68	3.47	F
Total Income:	2,937.65	3,042.84	2,224.64	(-) 818.20	
Expenditures:					
1) Variable Cost:					
Raw materials	554.28	574.13	585.80	(-) 11.67	U
Chemicals	86.92	90.03	102.80	(-) 12.77	U
Packing Materials	293.03	303.52	197.29	106.23	F
Oil & Lubricant	30.00	31.74	36.89	(-) 5.15	U
Spares & Accessories	30.00	31.74	29.69	2.05	F
Maintenance stores	6.00	6.21	7.48	(-) 1.27	U
Factory overhead	72.74	75.34	67.25	8.09	F
Selling and Dist. Expenses	2.47	2.56	5.21	(-) 2.65	U
Total Variable Cost:	1,075.44	1,115.27	1,032.41	82.86	F

Contd.....

Appendix-4.02 continued

Particulars	As per Budget	Flexible	Actual	Variance	Favourable/ unfavourable
ii) Fixed Cost:					
Wages & Allowances (Workers)	192.17	192.17	244.97	(-) 52.80	U
Salaries & Allow. (Staffs)	58.04	58.04	72.93	(-) 14.89	U
Salaries & Allow. (Officers)	66.62	66.62	90.12	(-) 23.50	U
Spares and accessories	24.00	24.00	20.25	3.75	F
Maintenance stores	3.00	3.00	4.49	(-) 1.49	U
Insurance	5.50	5.50	2.75	2.75	F
Head Office Overhead	42.71	42.71	33.22	9.49	F
Factory depreciation	387.28	387.28	283.58	103.70	F
Factory overhead	22.04	22.04	10.37	11.67	F
Oil & lubricant	24.00	24.00	20.26	3.74	F
Overhauling expenses	120.00	120.00	138.68	-18.68	U
Selling and Dist. expenses	3.46	3.46	0.03	3.43	F
Admn. overhead	69.91	69.91	84.63	-14.72	U
Interest & financial charges	282.67	282.67	282.65	0.02	F
Total fixed cost:	1,301.40	1,301.40	1,288.93	12.47	F
Total cost (i+ii)	2,376.84	2,416.67	2,321.34	95.33	F

Though production unit have exceeded the budget estimates but the expenses have exceeded the flexible budget in maximum head of expenditure of both variable and fixed costs. We suggest that the management should have been more alert in controlling the expenses through budget.

AMMONIUM SULPHATE PLANT

Particulars	As per Budget	Flexible Budget	Actual	Variance	Favourable/ Unfavourable
Production	11,000MT	11,027MT	11,027MT		
Sales	309.38	310.14	276.88	-33.26	U
Expenditure:					
i) Variable cost:					
Raw material	202.74	203.24	187.08	16.16	F
Chemicals	1.19	1.19	1.13	0.06	F
Packing materials	23.80	23.85	17.48	6.37	F
Spares and accessories	7.45	7.47	5.85	1.62	F
Power purchase	2.91	2.92	2.76	0.16	F
Maintenance & stores	1.68	1.68	1.73	-0.05	U
Factory overhead	2.96	2.96	0.83	2.13	F
Selling and Dist.	0.19	0.19	0.08	0.11	F
	242.92	243.50	216.94	26.56	F
ii) Fixed Costs:					
Wages & allowances (Workers)	6.72	6.72	8.71	-1.99	U
Salaries & allow. (Staffs)	6.46	6.46	7.63	-1.17	U
Salaries @ allow. (Officers)	5.30	5.30	7.17	-1.87	U
Spares & accessories	4.68	4.68	3.91	0.77	F
Maintenance & stores	1.25	1.25	1.15	0.10	F
Insurance	0.25	0.25	0.24	0.01	F
Depreciation	14.18	14.18	10.57	3.61	F
Factory overhead	9.19	9.19	12.21	-3.02	U
Head Office overhead (levy)	5.08	5.08	4.15	0.93	F
Selling & Dist.Over.	0.05	0.05	Nil	0.05	F
Interest & Fin.charge	4.10	4.10	4.19	-0.09	U
Administrative Over.	9.20	9.20	8.91	0.29	U
	66.46	66.46	68.84	-2.38	U
Total (i+ii)	309.38	309.96	285.78	24.18	F

Fixed costs have exceeded the budget estimates which is always discouraging.

Appendix - 4.03

BUDGET ANALYSIS OF NGFF (1985-86)

The unitwise (i.e. Urea & Amonia Sulphate Plant) Comparative Statement of budget & actual usage for the year 1985-86 has been noted below:

UREA PLANT

(Figure in Lac)

Particulars	As per Budget	Flexible Budget	Actual	Variance
Production Units	80,000.000 MT	80,313.875 MT	80,313.875 MT	-
(A) Local Sales	3,602.61	3,602.64	3,428.13	- 174.51
(B) Expenditure:				
(i) Variable Cost:				
Raw materials	758.16	761.13	738.10	+ 23.03
Chemicals	112.00	112.44	115.96	+ 3.52
Packing materials	344.00	345.35	307.62	+ 37.73
Casual labour	29.60	29.72	12.19	+ 17.53
Duty on electricity	64.00	64.25	61.68	+ 2.57
Oil & lubricants	38.47	38.62	39.77	- 1.15
Spares & accessories	47.04	47.22	49.74	- 2.52
Stores & consumption	25.00	25.09	26.11	- 1.02
Head Office levy	54.04	54.25	51.42	+ 2.83
Total Variable Cost (A):	1,477.31	1,478.07	1,402.59	+ 75.48
(ii) Fixed Cost:				
Wages and allowances (Workers)	308.04	308.04	397.88	- 89.84
Salaries and allowances (Staffs)	94.29	94.29	100.49	- 6.20
Salaries and allowances (Officers)	133.62	133.62	158.72	- 25.10
Spares and accessories	27.44	27.44	29.82	- 2.38
Insurance	4.50	4.50	3.11	+ 1.39
Maintenance and stores	15.00	15.00	35.23	- 20.23

Contd....

Appendix-4.03 continued

Depreciation	404.67	404.67	585.14 -	180.47
Factory overhead	49.33	49.33	20.05 +	29.28
Administrative overhead	109.11	109.11	98.81 +	10.30
Overhauling expenses	150.00	150.00	104.48 +	45.52
Selling and Distribution overhead	10.92	10.92	9.23 +	1.69
Interest and financial overhead	361.55	361.55	552.08 -	190.53
Total Fixed Cost (B) :	1,668.47	1,668.47	2,095.04 -	426.57
Total Cost (A+B) :	3,140.78	3,146.54	3,497.63 -	351.09

AMONIA PLANT

(Figure in Lacs)

Particulars	As per Budget	Flexible Budget	Actual		Variance
Production	8,000.00MT	10,004.16MT	10,004.16MT		-
(A) Local Sales	260.32	260.32	286.76	+	26.44
Expenditure:					
(i) Variable Cost:					
Raw materials	201.02	251.38	267.49	-	16.11
Chemicals	2.17	2.71	1.24	+	1.47
Packing materials	23.13	28.92	23.52	+	5.40
Casual labour	1.20	1.50	0.65	+	0.85
Power consumption	3.53	4.41	4.07	+	0.34
Spares & accessories	5.40	6.76	6.80	-	0.04
Stores consumption	2.92	3.65	2.85	+	0.80
Head Office overhead	3.90	4.88	4.30	+	0.50
Total Variable Cost:	243.27	304.21	310.92	-	6.71
(ii) Fixed Cost:					
Wages and allowances (Workers)	12.55	12.55	19.41	-	6.86
Salaries and allowance (Staffs)	8.71	8.71	10.51	-	1.80
Salaries & allowances (Officers)	9.78	9.78	10.34	-	0.56
Spares and accessories	3.60	3.60	4.53	-	0.93
Stores consumption	2.51	2.51	1.89	+	0.62
Insurance	0.25	0.25	0.17	+	0.08
Depreciation	24.14	24.14	30.39	-	6.25
Factory overhead	14.30	14.30	20.75	-	6.45
Administrative overhead	10.00	10.00	10.13	-	0.13
Selling & Dist.	4.00	4.00	0.40	+	3.60
Interest and financial charges	5.33	5.33	5.94	-	0.61
Total Fixed Cost:	95.17	95.17	114.46	-	19.29
Total Cost:	338.44	399.38	425.38	-	26.00

Appendix - 4.04

Statement showing fertilizer target and actual production with capacity utilization in Bangladesh for the last ten years (1976-77 to 1985-86) fertilizer-wise.

Year	Urea				T S P			
	Production target MT	Actual MT	% of Target achieved %	% of Capacity utilized %	Production target MT	Actual Production MT	% of Target achieved %	% of Capacity utilized %
1976-77	2,80,000	2,85,521	101.97	64.89	50,000	38,006	76.01	25.00
1977-78	2,23,000	2,12,464	95.28	48.29	40,000	41,274	103.19	27.15
1978-79	2,87,000	2,90,760	101.31	66.08	70,000	62,287	88.98	40.98
1979-80	3,40,000	3,61,206	106.24	82.09	80,000	71,118	88.90	46.79
1980-81	3,30,000	3,44,683	104.45	78.34	75,000	71,461	95.28	47.01
1981-82	3,35,000	3,45,405	103.11	78.50	85,000	57,888	68.10	38.08
1982-83	3,35,000	3,71,010	110.75	84.32	75,000	68,603	91.47	45.13
1983-84	7,30,000	7,24,247	99.21	74.82	90,000	81,243	90.27	53.45
1984-85	7,10,000	7,41,554	104.45	76.61	55,000	55,192	100.35	36.31
1985-86	8,20,000	8,12,333	99.07	83.92	100,000	100,758	100.76	66.29
Total:	43,90,000	44,89,183	102.26	75.02	720,000	647,830	89.98	42.62

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Appendix-4.04 continued

Year	Ammonium Sulphate				Total			
	Production target MT	Actual production MT	% of target achieved %	% of Capacity utilized %	Production target MT	Actual production MT	% of target achieved %	% of Capacity %
1976-77	8,000	9,261	115.76	77.18	3,38,000	3,32,788	98.46	55.10
1977-78	9,000	9,553	106.14	79.61	2,72,000	2,63,291	96.80	43.59
1978-79	6,000	5,325	88.75	44.38	3,63,000	3,58,372	98.73	59.33
1979-80	9,000	9,852	109.47	82.10	4,29,000	4,42,176	103.07	73.21
1980-81	9,000	9,860	109.56	82.17	4,14,000	4,26,004	102.90	70.53
1981-82	9,000	11,566	128.51	96.38	4,29,000	4,14,859	96.70	68.69
1982-83	9,000	12,282	136.47	102.35	4,19,000	4,51,895	107.85	74.82
1983-84	11,000	11,027	100.25	91.89	8,31,000	8,16,517	98.26	72.13
1984-85	9,500	9,634	101.41	80.28	7,74,500	8,06,380	104.12	71.23
1985-86	8,000	10,004	125.05	83.37	9,28,000	9,23,095	99.47	81.55
Total:	87,500	98,364	112.42	81.97	51,97,500	52,35,377	100.73	68.67

Reference: Prepared by the researcher from Annual Reports and Audit Reports.

Appendix - 4.05

Statement showing target and actual production with capacity utilization of urea fertilizer

(Factory-wise)

Year	NGFF				UFFL			
	Production target MT	Actual production MT	% of Target achieved %	% of Capacity utilized %	Production target MT	Actual production MT	% of Target achieved %	% of Capacity utilized %
1976-77	60,000	77,446	129.08	77.45	2,20,000	2,08,075	94.58	61.20
1977-78	70,000	61,427	87.75	61.43	1,53,000	1,51,037	98.72	44.42
1978-79	52,000	54,637	105.07	54.64	2,35,000	2,36,123	100.48	69.45
1979-80	90,000	1,04,594	116.22	104.59	2,50,000	2,56,612	102.64	75.47
1980-81	90,000	99,201	110.22	99.20	2,40,000	2,45,482	102.28	72.20
1981-82	85,000	92,542	108.87	92.54	2,50,000	2,52,863	101.15	74.37
1982-83	85,000	87,166	102.55	87.17	2,50,000	2,83,844	113.54	83.48
1983-84	85,000	88,044	103.58	88.04	2,65,000	2,57,164	97.04	75.64
1984-85	85,000	95,282	112.10	95.28	2,25,000	2,31,744	103.00	68.16
1985-86	80,000	80,314	100.39	80.31	3,00,000	3,06,690	102.23	90.20
Total :	7,82,000	8,40,653	107.50	84.07	23,88,000	24,29,634	101.74	71.46

Contd.....

Appendix-4.05 continued

Year	ZFCL				TOTAL			
	Production target MT	Actual production MT	% of Target achieved %	% of Capacity utilized %	Production target MT	Actual production MT	% of Target achieved %	% of Capacity utilized %
1976-77	-	-	-	-	2,80,000	2,85,521	101.97	64.89
1977-78	-	-	-	-	2,23,000	2,12,464	95.28	48.29
1978-79	-	-	-	-	2,87,000	2,90,760	101.31	66.08
1979-80	-	-	-	-	3,40,000	3,61,206	106.24	82.09
1980-81	-	-	-	-	3,30,000	3,44,683	104.45	78.34
1981-82	-	-	-	-	3,35,000	3,45,405	103.11	78.50
1982-83	Commissioned on 1983-84			-	3,35,000	3,71,010	110.75	84.32
1983-84	3,80,000	3,79,039	99.75	71.79	7,30,000	7,24,247	99.21	74.82
1984-85	4,00,000	4,14,528	103.63	78.51	7,10,000	7,41,554	104.45	76.61
1985-86	4,40,000	4,25,329	96.67	80,55	8,20,000	8,12,333	99.07	83.92
Total:	12,20,000	12,18,896	99.91	76.95	43,90,000	44,89,183	102.26	75.02

Reference: Prepared by the researcher from Annual Reports and Audit Reports.

Appendix - 4.06

Natural Gas Fertilizer Factory Limited
Fenchugonj, Sylhet

Statement showing production cost (Urea Plant)

(In lac taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Yearly Average
A. FIXED COST:						
Salaries and wages	276.89	276.68	408.02	411.48	657.09	406.03
Stores, spares and accessories	52.15	45.20	163.42	55.06	65.05	76.18
Insurance	4.90	3.38	2.75	3.48	3.11	3.53
Depreciation	387.39	348.13	283.58	364.88	585.14	393.82
Factory overhead	4.20	8.30	10.37	45.12	20.05	17.61
Admn. overhead	77.77	69.85	84.63	98.05	98.81	85.82
Interest and financial charges	62.11	289.42	282.65	369.89	552.08	311.23
Total Fixed Cost:	865.41	1040.96	1235.42	1347.96	1981.33	1294.22
B. VARIABLE COST:						
Raw materials	470.83	570.89	585.80	755.43	738.10	624.21
Chemicals	130.37	83.53	102.80	104.49	115.96	107.43
Packing materials	507.43	408.33	197.29	481.78	307.62	380.49
Power, Fuels, Oil and lubricant	-	-	57.15	64.35	101.45	44.59
Stores, spares and accessories	78.23	67.53	37.17	56.08	75.85	62.97
Contract labour	-	-	-	20.07	12.19	6.45
Factory overhead	25.99	21.84	67.25	71.96	104.48	58.31
Selling and Distribution Overhead	5.46	9.95	5.25	6.70	9.23	7.32
Head Office Overhead	51.90	43.22	33.22	51.96	51.42	46.34
Total Variable Cost	1270.21	1205.29	1085.93	1612.82	1516.30	1338.11
C. TOTAL PRODUCTION COST (A+B)	2135.62	2246.25	2321.35	2960.78	3497.63	2632.33

Sources:

1. Natural Gas Fertilizer Factory Limited, "Audit Reports: 1981-82, 1982-83, 1983-84, 1984-85, 1985-86", Sylhet.
2. Natural Gas Fertilizer Factory Limited, "Annual Reports: 1983-84, 1984-85, 1985-86", Sylhet.
3. Bangladesh Chemical Industries Corporation, "Annual Reports: 1981-82, 1982-83, 1983-84, 1984-85, 1985-86", Dhaka.
4. Bangladesh Chemical Industries Corporation, "Ten Years of BCIC", Dhaka.

Appendix - 4.07

Natural Gas Fertilizer Factory Limited
Fenchugonj, Sylhet

Statement showing production cost
(Ammonium Sulphate Plant)

(Amount in Lac Taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Yearly Average
A. FIXED COST:						
Salaries and wages	17.14	16.84	23.51	27.60	40.26	25.07
Stores, spares and accessories	13.80	6.23	5.06	5.15	6.42	7.33
Insurance	.04	.04	.24	.11	.17	.12
Depreciation	14.92	14.16	10.56	18.41	30.39	17.69
Factory overhead	8.22	8.30	12.21	16.57	20.75	13.21
Administrative overhead	10.03	9.89	8.91	10.83	10.13	9.96
Interest and financial charges	6.64	4.22	4.19	4.48	5.94	5.09
Total Fixed Cost:	70.79	59.68	64.68	83.15	114.0	78.47
B. VARIABLE COST:						
Raw materials	179.60	214.26	187.08	175.76	267.49	204.84
Chemicals	1.40	1.21	1.13	1.00	1.24	1.20
Packing materials	26.22	32.75	17.48	25.12	23.52	25.02
Power and fuel, oil lubricant	2.25	2.23	2.76	6.22	4.07	3.51
Stores, spares and accessories	20.69	9.39	7.58	6.36	9.65	10.73
Contact labour	-	-	-	.82	.65	.30
Factory overhead	.95	.96	.83	1.11	-	.77
Selling and distribution overhead	4.44	.13	.08	1.06	.40	1.22
Head Office Overhead	4.14	4.58	4.15	4.81	4.30	4.39
Total Variable Cost:	239.69	265.51	221.09	222.26	311.32	251.98
C. TOTAL PRODUCTION COST (A+B)	310.48	325.19	285.77	305.41	425.38	330.45

Sources:
1. Natural Gas Fertilizer Factory Limited, "Audit Reports: 1981-82, 1982-83, 1983-84, 1984-85, 1985-86", Sylhet.
2. Natural Gas Fertilizer Factory Limited, "Annual Reports: 1983-84, 1984-85, 1985-86", Sylhet.
3. Bangladesh Chemical Industries Corporation, "Annual Reports" 1981-82, 1982-83, 1983-84, 1984-85, 1985-86", Dhaka.
4. Bangladesh Chemical Industries Corporation, "Ten Years of BCIC", Dhaka.

Appendix - 4.08

Urea Fertilizer Factory Limited
Ghorasal, Narsingdi

Statement showing production cost

(in Lac taka)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Yearly Average
A. FIXED COST						
Salaries and wages	210.76	220.66	344.89	345.72	591.15	342.64
Stores, spares and accessories	145.19	105.68	101.95	85.80	105.94	108.91
Insurance	-	-	9.58	5.47	11.46	5.30
Depreciation	786.19	422.61	427.00	766.31	1,505.83	781.59
Factory overhead	75.10	272.73	319.61	423.05	-	218.10
Administrative O'head	68.00	55.23	70.79	83.68	202.16	95.97
Selling and distribution overhead	2.45	2.61	2.36	3.94	-	2.27
Interest on financial charges	93.89	59.85	111.88	112.36	160.35	107.67
Total Fixed Cost:	1381.58	1139.37	1388.06	1826.33	2576.89	1662.45
B. VARIABLE COST:						
Raw materials	1,150.85	1,333.84	2,312.50	1,324.99	1,613.53	1,547.14
Chemicals	-	-	-	344.75	296.95	128.34
Packing materials	1,163.27	1,084.09	-	1,263.23	1,187.73	939.66
Power and fuel, oil and lubricant	478.40	326.76	333.52	209.55	537.00	377.05
Stores, spares and accessories	272.15	275.83	154.89	146.62	244.24	218.75
Contract labour	32.30	32.65	31.74	32.09	31.99	32.15
Factory overhead	7.28	22.27	48.35	38.19	25.73	28.36
Selling and distribution overhead	4.30	174.59	152.40	178.78	123.86	126.79
Head Office overhead	85.10	149.44	103.22	111.41	112.89	112.41
Total Variable Cost:	3193.65	3399.49	3136.62	3649.61	4173.92	3510.65
C. TOTAL PRODUCTION COST (A+B)	4,575.23	4,538.84	4,524.68	5,475.94	6,750.81	5,173.10

Sources:

1. Urea Fertilizer Factory Limited, "Audit Reports: 1981-82, 1982-83, 1983-84, 1984-85, 1985-86", Ghorashal, Narsingdi.
2. Urea Fertilizer Factory Limited, Annual Report and Accounts: 1985-86, Ghorashal, Narsingdi.
3. Bangladesh Chemical Industries Corporation, Annual Reports: 1981-82, 1982-83, 1983-84, 1984-85, 1985-86, Dhaka.
4. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, Dhaka.

Appendix - 4.09

Triple Superphosphate Complex Limited
North Potenga, Chittagong

Statement showing production cost

(Taka in Lac)

Particulars	1981-82	1982-83	1983-84	1984-85	1985-86	Yearly Average
A. FIXED COST:						
Salaries and wages	153.28	163.49	264.90	247.18	434.97	252.76
Stores, spares and accessories	-	24.00	39.37	-	-	12.67
Insurance	5.61	9.11	10.44	11.75	12.22	9.83
Depreciation	-	183.85	238.30	283.85	389.89	219.18
Factory overhead	32.18	59.23	41.61	20.99	136.22	58.05
Administrative overhead	108.14	64.10	86.21	102.84	130.13	98.28
Selling and distribution overhead	.33	.11	.05	.11	-	.12
Interest and financial charges	158.06	229.93	99.60	301.33	286.08	215.00
Total Fixed Cost:	457.60	733.82	780.48	968.05	1,389.51	865.89
B. VARIABLE COST:						
Raw materials	2,607.96	2,977.20	3,460.70	2,269.78	5,086.15	3,280.36
Chemicals	20.36	21.58	15.44	12.03	23.42	18.57
Packing materials	164.23	194.21	220.62	158.97	290.49	205.70
Power, fuel, and oil lubricant	131.85	181.10	393.61	231.53	383.26	264.27
Stores, spares and accessories	220.03	153.48	126.73	106.12	137.42	148.76
Contract labour	-	-	13.39	14.01	-	5.48
Factory overhead	23.55	36.77	24.45	19.83	105.75	42.07
Selling and distribution overhead	2.38	2.08	4.30	2.25	4.21	3.04
Head Officeroverhead	14.54	8.82	-	19,18	32.77	15.06
Total Variable Cost:	3,184.90	3,575.24	4,259.24	2833.70	6063.47	3983.31
C. TOTAL PRODUCTION COST (A+B)	3,642.50	4,309.06	5039.72	3801.75	7,452.98	4849.20

Sources: 1. Triple Superphosphate Complex Limited, "Audit Reports: 1981-82, 1982-83, 1983-84, 1984-85, 1985-86", Chittagong.

2. Triple Superphosphate Complex Limited, "Annual Reports: 1983-84, 1984-85, 1985-86", Chittagong.

3. Bangladesh Chemical Industries Corporation, "Annual Reports: 1981-82, 1982-83, 1983-84, 1984-85, 1985-86, Dhaka.

4. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, Dhaka.

Appendix - 4.10

Zia Fertilizer Company Limited
Ashugonj, Brahmanbaria

Statement showing production cost (Amount in Lac Taka)

Particulars	1983-84	1984-85	1985-86	Yearly Average
A. FIXED COST:				
Salaries and wages	269.87	309.32	470.94	350.04
Stores, spares & accessories	103.36	73.41	120.26	99.01
Insurance	123.95	129.80	187.90	147.22
Depreciation	4,385.52	6,226.18	6,792.05	5,801.25
Factory overhead	468.76	794.11	438.12	567.00
Administrative overhead	112.49	114.38	217.50	148.12
Intterest and financial charges	5,331.66	2,194.77	4,067.48	3,864.64
Total Fixed Cost:	10,795.61	9,841.97	12,294.25	10,977.28
B. VARIABLE COST:				
Raw materials	1,667.23	1,850.11	2,654.46	2,057.27
Chemicals	143.05	172.03	416.73	243.94
Packing materials	1,102.42	1,488.92	1,324.10	1,305.15
Power & fuel, oil & lubr.	26.83	19.99	11.16	19.32
Stores, spares and accessories	155.04	110.12	292.09	185.75
Contract labour	38.33	37.37	66.05	47.25
Selling & distribution overhead	12.86	13.58	17.90	14.78
Head Office overhead	44.55	149.89	239.92	144.78
Total Variable Cost:	3,190.31	3,842.01	5,022.41	4,018.24
C. TOTAL PRODUCTION COST (A+B)	13,985.92	13,683.98	17,316.66	14,995.52

Sources:
1. Zia Fertilizer Company Limited, Audit Reports: 1983-84, 1984-85, 1985-86, Ashugonj, Brahmanbaria.
2. Zia Fertilizer Company Limited, "Annual Reports: 1983-84, 1984-85, 1985-86", Ashugonj, Brahmanbaria.
3. Bangladesh Chemical Industries Corporation, Annual Reports: 1983-84, 1984-85, 1985-86" Dhaka.
4. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, Dhaka.

Appendix - 6.01

Natural Gas Fertilizer Factory Limited
Fenchugonj, Sylhet

Statement of Down-time

(Figures in Days)

Causes of Down-time	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	Average
1. Power trouble	13	18	8	8	19	21	37	-	13	20	16
2. Mechanical trouble	84	113	144	34	41	36	30	36	29	33	58
3. Shortage of spare parts	29	30	14	-	-	-	-	-	-	-	7
4. Shortage of raw materials	12	-	6	-	5	14	15	26	-	-	8
5. Shortage of skilled manpower	-	-	-	-	-	-	-	-	-	-	-
6. Non-lifting of finished goods	-	-	-	-	-	-	-	-	-	-	-
7. Schedule shut down	-	-	20	7	-	28	18	58	14	47	19
Total Days :	138	161	192	49	65	99	100	120	56	100	108

Appendix - 6.02

Urea Fertilizer Factory Limited
Ghorasal, Narsingdi

Statement of Down-time

(Figures in Days)

Causes of Down-Time	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	Average
1. Power trouble	5	39	20	24	-	5	9	6	6	10	13
2. Mechanical trouble	59	104	42	64	41	71	32	60	24	53	55
3. Shortage of spare parts	-	-	-	-	-	-	-	-	-	-	
4. Shortage of raw-materials	2	-	25	2	3	-	-	-	6	2	4
5. Shortage ofskilled manpower	-	-	-	-	2	-	-	-	-	-	-
6. Non-lifting of finished goods	-	-	-	-	-	-	-	-	-	-	-
7. Schedule Shutdown	77	60	24	-	67	40	36	28	-	19	35
Total Days :	143	203	111	90	113	116	77	94	36	84	107

Appendix - 6.03

Zia Fertilizer Company Limited
Ashugonj, Brahmanbaria

Statement of Down-Time

(Figures in Days)

Causes of Down-time	1983-84	1984-85	1985-86	Average
1. Power trouble	3	1	4	3
2. Mechanical trouble	17	41	41	33
3. Shortage of spare parts	-	-	-	-
4. Shortage of raw-materials	-	-	-	-
5. Shortage of skilled manpower	-	-	-	-
6. Non-lifting of finished goods	-	-	-	-
7. Schedule shutdown	35	35	35	35
Total Days:	55	77	80	71

Appendix - 6.04

Triple Superphosphate Complex Limited
North Potenga, Chittagong

Statement of Down-time

(Figures in Days)

Causes of Down-time	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	Average
1. Power trouble	24	20	12	4	11	6	5	7	2	17	11
2. Mechanical trouble	88	179	113	58	54	108	71	129	84	58	94
3. Shortage of spare parts	-	-	-	-	-	-	-	-	-	-	-
4. Shortage of raw materials	108	35	79	75	71	74	22	-	2	50	52
5. Shortage of skilled manpower	-	-	-	-	-	-	-	-	-	-	-
6. Non-lifting of finished goods	-	-	10	15	48	51	-	38	-	-	16
7. Schedule Shut-down	-	-	-	47	-	-	129	23	162	46	41
Total Days :	220	234	214	199	184	239	227	197	250	171	214

Appendix - 7.01

QUESTIONNAIRE

Department of Accounting
University of Dhaka

Ph.D. Programme : Efficacy of Cost Control and Cost Reduction Measures in the Fertilizer Industry of Bangladesh.

(The answers will be kept strictly confidential and used for purely academic purposes).

A. PERSONAL

1. Name : .....

2. a) Designation : .....

   b) Factory/ Head Office : .....

3. Experiences in the Bangladesh Chemical Industries Corporation:

   a) Fertilizer Factory : ..... years

   b) Other Factories : ..... years

   c) BCIC Head Office : ..... years

4. Academic Qualifications (Professional qualification, if any):

5. Trainings:

Institutions	Period of Training	Subject of Training

B. COST DATA

Questions	Answers Tick (✓) one				
	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
	A	B	C	D	E
1. Costing records of our fertilizer factory is satisfactory.	A	B	C	D	E
2. There is no scope for any material being used wastefully.	A	B	C	D	E
3. There is no scope for any material being pilfered.	A	B	C	D	E
4. There is scope for reducing purchase price of materials through more effective purchase policy and procedure.	A	B	C	D	E
5. There are substitute materials which can be obtained at a lower cost.	A	B	C	D	E
6. Workers in the factory are very much careful in the use of materials	A	B	C	D	E
7. Supervisors in the factory are alert to ensure that no loss of material occurs.	A	B	C	D	E
8. Factory supervisors are very much interested to ensure proper utilization of labour for keeping the cost down.	A	B	C	D	E
9. Heads of departments are very much careful in the proper utilization of office manpower for keeping the cost to the minimum.	A	B	C	D	E
10. Sincere effort is made to mimimise overtime work.	A	B	C	D	E
11. Engineering department is very much careful in keeping the repair and maintenance expenses of office equipments, buildings, transport vehicles and factory plants and machines to the minimum	A	B	C	D	E

Contd...

Appendix-7.01 continued

Questions	A	B	C	D	E
12. Transport/Traffic department are very much careful to keep use of fuel expenses to the minimum.	A	B	C	D	E
13. Every body sincerely tries to keep the cost of electricity to the minimum.	A	B	C	D	E
14. Staffs in the office are very much careful in the use of office stationery.	A	B	C	D	E
15. Enterprise head is very much interested in keeping the over-head expenses to the minimum.	A	B	C	D	E
16. Our inventory management, stock taking and recording of incoming and outgoing spare parts and tools are quite effective for cost control purposes.	A	B	C	D	E
17. Office heads are interested in keeping the cost of drugs to the minimum.	A	B	C	D	E
18. Costs of fertilizer factories can be reduced if a system of cost audit is introduced.	A	B	C	D	E
19. Budgt is now used for effectively controlling costs.	A	B	C	D	E
20. Actual expenditures on various heads are timely compared with the budgeted expenditures to take remedial action.	A	B	C	D	E

C. COST REDUCTION

(Appendix-7.01 continued)

Questions	Answers: Cost Reduction is possible				
	0%	5%	10%	15%	More than 15%
	A	B	C	D	E
1. Cost of raw materials can be reduced.	A	B	C	D	E
2. Cost of chemicals can be reduced.	A	B	C	D	E
3. Cost of packing materials can be reduced.	A	B	C	D	E
4. Salaries and wages of workers can be reduced.	A	B	C	D	E
5. Salaries and wages of staffs can be reduced.	A	B	C	D	E
6. Salaries and wages of officers can be reduced.	A	B	C	D	E
7. Factory overhead can be reduced.	A	B	C	D	E
8. Administrative overhead can be reduced.	A	B	C	D	E
9. Selling and distribution overhead can be reduced.	A	B	C	D	E

D. SUGGESTIONS

1. Please recommend five steps that may help fertilizer factories in keeping cost to the minimum (control and reduction).

i)

ii)

iii)

iv)

v)

Appendix - 7.02

Natural Gas Fertilizer Factory Limited
Fenchugonj, Sylhet

Particulars of the Respondents

Designation	Qualifications	Experiences			Training		No. of Personnel	Remarks on Foreign Training
		Fertilizer Factory	Other factory	BCIC Head Office	Domestic	Foreign		
		Years	Years	Years	Months	Months		
A. ACCOUNTS PERSONNEL:								
Additional Chief Accountant.	B.Com.,ACA	4	-	-	-	-	1	
Deputy Chief Accountant	B.Com.	30	-	-	1	-	1	
Asstt. Chief Accountant	B.Com.	19	-	-	1	-	1	
Accounts Officer	B.Com.	15	-	-	1	-	2	
	Matriculation	21	-	-	-	-	1	
							6	
C. NON-ACCOUNTS PERSONNEL:								
General Manager	B.Sc.Engg. (Chem.)	12	9	-	2	13	1	3 months - Egypt, 6 months - West Germany
Deputy General Manager	B.A.	3	7	3	6	-	1	2 months - Japan, 2-USA
Chief Engineer	Dip.in-Engg.	27	-	-	1	7	1	7 months-Japan: Maintainance system on Fertilizer Industry.
Dy. Chief Engg. Elec.	Dip.in-Engg.	21	-	-	-	-	1	
Addl. Chief Operational Manager	B.Sc.	28	-	-	3	3	1	3 months-Japan: Advance techniques of Japanese Fertilizer Industry.
Deputy Chief Chemist	B.Sc.	26	-	-	-	-	1	
Deputy Chief Chemist	B.Sc.	25	2	-	2	--	1	
							7	
D. Total Respondents (A+B)							13	

Urea Fertilizer Factory Limited
Ghorashal, Narsingdi

Particulars of the Respondents

Designation	Qualification	Experiences			Training		No. of Personnel	Remarks on Foreign Training
		Fertilizer Factory Years	Other factory Years	BCIC Head Office Years	Domestic Months	Foreign Months		
A. ACCOUNTS PERSONNEL								
Chief Accountant	B.Com.,ACA	7	-	-	-	-	1	
Dy.Chief Accountant	M.Com.,FCMA	5	3	5	3	-	1	
	B.Com.,C.A. Final Gr-II	2	6	4	1	-	1	
	B.Com.	1	10	10	4	-	1	
Assistant Chief Accountant	M.Com.,ACMA	2	-	6	9	-	1	
	B.Com.	20	-	-	1	-	1	
Accounts Officer	B.Com.	17	-	-	1	-	1	
		3	7	3	3	-	1	
	Matriculation	20	-	-	1	-	2	
							10	
B. NON-ACCOUNTS PERSONNEL								
Chief Operation Manager	M.Sc. (Applied Chem)	27	-	-	-	18	1	2-months-Japan, Fertili-industry. 6 months:India
Chief Commercial Manager	B.Sc.,MBA	2	18	-	-	6	1	6 months: The Netherland: Advanced Marketing Management and Physical distribution.
Chief (MPIC)	B.Sc.,AMIE, DPM	17	7	3	-	18	1	6 months: Japan, 12 mns. USA; International Fertilizer Development Centre.
							3	
C. Total Respondents (A+B)							13	

Appendix - 7.04

Triple Superphosphate Complex Limited
North Potenga, Chittagong

Particulars of the Respondents

Designation	Qualifications	Experiences			Trainings		No. of Personnel	Remarks on Foreign Training
		Fertilizer Factory	Other Factory	BCIC Head Office	Domestic	Foreign		
		Years	Years	Years	Months	Months		
A. ACCOUNTS PERSONNEL								
Chief Accountant	B.Com., M.Com.(Prel)	2	23	1	5	-	1	
Addl.Chief Accountant	B.Com.	4	22	-	13	-	1	
Dy. Chief Accountant	B.Com.,ACMA	6	7	-	2	-	1	
	Intermediate (PIIA-Prel.)	8	9	-	1	-	1	
Asstt. Chief Accountant	B.Com.	4	10	-	1	-	1	
Accounts Officer	B.Com., CA Course completed	5	11	-	1	-	1	
	B.Com., LL.B	3	14	-	-	-	1	
	B.Com.	17	-	-	1	-	1	
		13	-	-	2	-	1	
	Intermediate	22	-	-	1	-	2	
		6	9	-	2	-	1	
							12	

Contd.

Appendix-7.04 continued

Designation	Qualifications	Experiences			Training		No. of Personnel	Remarks on Foreign Training
		Fertilizer factory	Other factory	BCIC Head Office	Domestic	Foreign		
		Years	Years	Years	Mns	Mns		
B. NON-ACCOUNTS PERSONNEL								
Chief Operation Manager	B.Sc.Engg. (Chem.)	12	4	1	2	-	1	
Additional Chief Admn. Manager	M.Sc.	9	6	-	2	-	1	
Additional Chief Engineer (Mech.)	Dip.in Engg.	21	-	-	-	1	1	1-month: USA, International Fertilizer Development Centre
Manager (Purchase)	B.Com.	2	20	-	3	-	1	
Chemist	B.Sc.	18	2	-	1	-	1	
Chemist in-charge of R&DC Department	B.Sc.	2	21	-	1	-	1	
Assistant Chemist	M.Sc.,Ph.D.	9	2	-	1	-	1	
							7	
C. TOTAL RESPONDENTS (A+B)							19	

Appendix - I

Zia Fertilizer Company Limited
Ashugonj, Brahmanbaria
Particulars of Respondents

Designation	Qualifications	Experiences			Trainings		No. of Personnel	Remarks on Foreign Trainings
		Fertilizer factory	Other factory	BCIC Head Office	Domestic	Foreign		
		Years	Years	Years	Months	Months		
A. ACCOUNTS PERSONNEL								
Chief Accountant	B.Com., ACA	9	-	-	-	4	1	4 months-Clasgo: Strathdyde Business School - Accounting and Finance for developing countries.
Addl. Chief Accountant	M.A., FCMA	10	-	-	-	-	1	
	M.Com.	6	5	2	4	-	1	
	B.Com., C.A. (Course completed)	2	4	6	2	-	1	
Deputy Chief Accountant	B.Com., FCMA	7	-	-	5	-	1	
	B.Com., ACMA	5	-	-	-	-	1	
	B.Com., PIIA (Course Completed)	2	5	7	-	-	1	
	B.Com.	21	-	-	6	-	1	
		11	-	-	-	-	1	
		8	-	13	-	-	1	
Assistant Chief Accountant	B.Com., C.A. (Course Completed)	9	-	-	5	-	1	
	B.Com.	2	13	-	2	-	1	
		4	9	-	1	-	1	
Accounts Officer	M.Com., ICMA P-II	10	-	-	1	-	1	
	M.Com.	8	-	-	-	-	1	
	B.Com.	18	-	-	5	-	2	
		8	-	-	1	-	3	
	B.A.	18	-	-	2	-	1	
							21	

Appendix- 7.05 continued

Designation	Qualification	Experiences			Trainings		No. of Personnel	Remarks on Foreign Training
		Fertilizer Fact.	Other factory	BCIC Head Office	Domestic	Foreign		
		Yrs.	Yrs	Yrs	Months	Months		
A. NON-ACCOUNTS PERSONNEL								
Managing Director	M.Sc. (Chem.)	12	15	-	-	23	1	7 months-Japan: Govt. Institute of Research, Tokyo. 1-month Philippines: Asian Institute of Management, Manila.
General Manager (MPIC)	Dip-in-Engg.	17	10	-	-	-	1	3 months-Australia: International Training Institute, Sydney. 12 months-USA: International Fertilizer Development Centre, Alabama.
Chief Commercial Manager	M.Com.	1	20	-	-	-	1	
Chief Engineer	B.Sc. Engg. (Mech.)	10	9	-	-	19	1	17 months: West Germany. 2-months: Australia. ½ months-Japan.
Chief (Utility Plant)	M.Sc. (Chem)	26	-	-	-	5	1	5 months: Netherland
Additional Chief C[illegible]ation Manager	B.Sc.	28	6	-	-	21	1	13 months-Japan; 3-months-USA; 3 months-Indonesia.
Additional Chief Admn. Manager.	M.A.	3	8	7	2	2	1	12-months: Czechoslavakia.
Assistant Chief Engineer (Tech.)	Dip-in-Engg.	12	5	2	-	11	1	4-months: Japan, 4-months, Indonesia, 3-months: Australia.
							8	
C. TOTAL RESPONDENTS (A+B)							29	

Appendix - 8.01

Internal Audit Report of the Zia Fertilizer Company Limited for the period from December 1983 to December, 1984.

BCIC Head Office Memo: Audit Dept. 311.08(1)705 dt. 13.10.1986.
Reply: ZFCL/Int.Audit/005/126 dt. 02.09.1987.

1. In respect of the case against Fosterwheeler Company (contracting Company).

2. The project incurred a loss of Tk.36,45,270.00 in order to manufacture Polythene bags from Polythene Pellets and in the process 92.26 tons of Polythene Pellets were misused.

3. An amount of Tk.1,38,75,935.05 was paid as Customs Duty and Sales Tax (refundable) and the same was not claimed and recovered timely. The claim for refund of deposited Customs Duty on two purchase orders were not effected timely for which the factory sustained huge loss.

4. Deposited Customs Duty and Sales Tax paid in excess of Tk.69.82 crores has remained unrealised.

5. A quantity of 350 MT of Polythene Pettets was transported by Railway Wagon from the Chittagong Port a quantity of 9.343 MT was shown as transit shortage which is valued to Tk.4,03,243.00. The amount should be realised subject to investigation.

6. An amount of Tk.26,26,545.00 has been deposited as Customs Duty and Sales Tax which is paid in excess and so refundable. But the same has not been realised till the date of auditing and for which an amount of interest to the tune of Tk.5,41,000.00 has accrued thereon.

7. An amount of Tk.1,174.00 as T.A. bill has been paid to Mr. S.M. Anowar Sadat, Assistant Engineer which is paid in excess and so realisable.

8. An amount of Tk.1,174.00 has been paid to Mr. Naser Alam, Assistant Engineer in excess of his T.A. Bill which is realisable.

9. An amount of Tk.23,372.34 has been paid as 2 increments to the persons who are not freedom fighters, nor they are associates even they have no connection to the freedom fighting. These people do not even fall within the scope of the notification in which the facilities for the freedom fighters has been defined. This amount should be realised.

10. M/S. Toki and Boki Ltd., Osaka, Japan failed to supply 50 MT Potasium Carbonate as per contract for which the factory incurred a loss of Tk.35,000.00 against a shortfall of 1973.4 kg. of Urea valued at Tk.11,59,000.00.

11. The factory incurred a loss of some lacs of Taka as 24,300 gallons of Lub oil was sold on negotiation without calling any tender.

12. The factory incurred a loss of Tk.1,05,375.00 as the spares were imported not according to the specification and which could not be utilized by the factory.

13. The factory incurred a loss of Tk.246.00 for the wrong calculation of mileage on travelling bill.

14. The factory suffered a loss of Tk.23,92,235.00 arising out of handling loss of 619 MT of Urea in the sales of 3,52,854.05 MT during January, 1984 to December, 1984. So there should be control measure on handling loss.

15. There was negligence of duties for the employees concerned did not put the connected documents to the Sadharan Bima Corporation for clearing a short receipts and wastage of 1.74 MT in the import of 200 MT of Granular Sodium.

16. A quantity of 800 MT of sweeping Urea is lying unsold and being damaged, price of which comes to Tk.20,00,000.00.

17. There was a loss of Tk.81,932.44 for the claim was not accept by the Sadharan Bima Corporation.

18. Upto 31-12-1984 an amount of 8,21,49,410.40 has been claimed as insurance under I.A.R. Policy and against it only Tk.1,61,92,975.00 has been accepted by the insurance authority for which an amount of Tk.6,50,54,247.40 is lying unsettled has not been accounted for.

19. i) Store Accounting System is not regular. So there should be control over the Store Accounting System of the ZFCL.

ii) Regarding the furniture worth of Tk.1,62,334.15 to be entered in the Store Account on 31-12-1984.

iii) Modification of accounts head is necessary.

20. Store-in-Transit on 31-12-1984 an amount of Tk.9,79,03,675.87 is lying un-adjusted, it should be adjusted.

21. i) Regarding the loan of 6,000 kg. Polythene Pellets worth of Tk.2,40,000.00 to M/S. Bengal Building Corporation.

ii) A quantity of 12,000 kg. of Polythene Pellets have been given as loan to UFFL and it has not been realised upto 30-6-1985, realising should be effected soon.

22. i) A quantity of 86 Drums of Perfector - T 46 Lub oil is lying unsold upto 30-6-1985. Sale of which should be effected soon.

ii) A quantity of 260 Drums of Perfector - T 46 Lub oil is lying unaccounted for in the store from the period of Foster Wheeler.

iii) Unused different stored lub oils should be sold immediately.

iv) 505 Barrels of Condemset Oil (By-product) is lying unsold in the store, sale of which should be effected soon.

23. Re-factory goods of different kinds worth of Tk.1,04,90,027.60 is lying unused. If these are not necessary for the factory, it should be sold out to increase the working capital of the factory.

24. i) Accessories of different sold out equipments are lying in the stores, which should be sold out immediately.

ii) Tyres and Tubes worth of about Tk.7.41 lacs are lying in the store since 1981. Tyres and Tubes which are more than requirement should be sold out to show a decrease in the store inventory.

iii) Welding Electrods worth of Tk.47.43 lacs are lying in the store which are not to be used by the factory, should be sold out.

iv) Chemicals connected with production worth of a large amount are lying over a long period in the store, usage of the same is very slow. If this is stored this way for a long time; its efficacy will be ruined, should be disposed of with the concurrence of the utilising department.

v) Many goods purchased by the Foster Wheeler for the project are lying in excess afterconstruction of the project (Erection Surplus), should be disposed of immediately.

vi) Many goods worth of a big amount are lying in excess in the store, should be disposed of early.

vii) Most valuable cable worth of a big amount are lying in the Store in excess should be disposed of.

25. The factory incurred a loss of Tk.14,800.00 as 148 bags of Cement lying in the stone find condition.

26. In the bagging Store 40,232 Hasian bags are damaged and 10,834 bags are found in shortage which amounts to Tk.7,65,990.37.

27. i) There should be control on spare parts.

ii) Issuance of goods in excess of to the Workshop and were received by the Workshop.

28. The physical count as on 30.6.85 at the store is yet incomplete.

29. There is an irregularity to the effect that there are many items without number and code are lying unlisted in the store.

30. Goods worth of Tk.2,77,82,061.00 was sold out to Bangladesh Army at Tk.13,89,099.00 (at 5%) the sale proceeds should be adjusted.

31. Regarding the refund of security amounting to Tk.2,33,777.80 to M/S. Fazle Azim Engineering Ltd. (Ref. Cheque Voucher No.472 dt. 1-10-84).

32. (i) Debit Note of unnecessary/inexcess have not been sent to the sister concern of the project. Debit Notes should be sent immediately.

(ii) There is an amount of Tk.30,86,079.44 lying unrealised against the goods sold to different sister concerns through Debit Notes.

33. There is a violation of government order relating to the provision of housing facilities to the 70 employees of the factory and adjustment of their salaries as per new national scales and realisation of house rent as per slab basis.

34. Workers discharging duties on shift basis are provided with fixed wages, inspite of that, their earned leave have been calculated 2 days in place of 1 day. This is an irregularity.

35. Officers/staffs/workers residing in the housing colony have been issued furniture from the factory, rent for the same are not realised.

36. During 1984-85 Gas for domestic use worth of Tk.11,15,000.00 has been consumed by the employees. The gas charge at fixed rate should be realised from the users.

37. Electricity consumed by the employees of the factory, should be realised from them at the fixed rate.

38. Actual expenses exceeds the budgeted figures for the period from December 1983 to June 1984 and from July 1984 to December 1984 were 84% and 23% respectively. Expenses over the budgeted figures should be controlled.

39. Without putting up an expense bill an amount of Tk.250.00 maternity bill was paid as irregularity in the system.

40. Refundable many goods were taken out of the factory gate through temporary gatepass, but the goods have not been realised yet. Recovery should be effected.

41. Out of 60 vehicles belonging to Zia Fertilizer Company Limited, 2 cars have been sold out, 2 cars running in Dhaka out of list and of the rest 56 vehicles, some are in running condition, some are awaiting repair in the workshop. Some are beyond repair with normal cost should be repaired or disposed of.

42. An amount of Tk.2,95,847.85 being the fuel cost of the Dhaka Office of the factory affairs to be expensive. Undated coupons and disagreement of coupon number and finally control over the fuel cost should be maintained.

43. In medical head an amount of Tk.283.50 has been overpaid.

44. There is an irregularity in a medical bill as the prescription was made by an eye specialist but the quantity of medicine was increased by somebody else.

45. Without ascertaining the fixed selling price of Canteen foods, subsidy can not be accounted, but within a period of 3 months the subsidy was increased to Tk.3,000.00. This is an irregularity.

46. (i) Medicines worth of Tk.5,940.00 is lying in the store with date expired, action should be taken in time.

(ii) Physical count of medicines should be done at medical centre.

(iii) Medical equipments at the medical centre should be physically counted.

(iv) Regarding the accounts of medical equipments.

47. ZFCL has filed a case against the project constructor M/S. Foster Wheeler Ltd. for US$ 36,505,248.57 as compensations.

48. (i) Suits have been initiated against 22 Engineers for violating the contract for job after factory sponsored training.

(ii) For the auction of some damaged goods a case has been initiated against M/S. Shamshu Mia Sawdagar for an amount of Tk.4,00,000.00 in the Munsiff and Criminal courts.

49. There should be control over the Guest House expenses of ZFCL. There is a sum of Tk.557.00 lying recoverable from the guests.

50. Bank Reconciliation Statement.

51. In an account with the Singapore Branch of American Express International Banking Corporation, an amount of US$8,561.13 (Approx. Tk.2,18,309.00) is lying unutilized for 2 years, causing a loss of Tk.65,405.00. It should be transferred if not necessary.

52. In the current account of American Express International Banking Corporation, Dhaka (A/C No. 7170218) an amount of Tk.68,753.36 is lying unutilized for the last 3 years causing a loss of Tk.33,106.00. If unnecessary, the account should be closed and the balance should be transferred to other account.

53. As at 30.6.85 a debit balance of Tk.5,42,02,155.02 is found in the BCIC's Current Account, which needs reconciliation.

54. In the heads of Inter-Projects an amount of Tk.2,73,572.13 upto 31.3.85 is lying unrealised.

55. i) In the account of Sundry Debtors upto 31.3.85, an amount of Tk.2,34,14,015.41 is lying unrealised, it should be realised/ adjusted.

ii) In the purchase/expense head as on 31.3.85 an amount of Tk.15,87,060.14 is lying unrealised. As per compound interest basis the factory incurred a loss of Tk.2,36,671.00.

iii) An amount of Tk.1,34,022.65 upto 31.3.85 against travelling and daily allowance is lying unrealised.

iv) An amount of Tk.31,78,404.02 is lying unrealised from the Suppliers upto 31.3.85.

56. A quantity of 341.50 MT of Sulfuric Acid worth of Tk.25,00,000.00 was spent in excess. The matter should be investigated and persons responsible should be charged.

57. A quantity of 13119.40 lbs. Sulfuric Acid worth of Tk.9,587.40 was short received from TSP Complex. The amount should be realised from the Transport Contractor.

58. Regarding estates and land of the factory premises.

59. Fixed Assets Register of the factory is not properly maintained. It should be properly maintained.

60. Comparative study of Income and Expenditure with the budgeted figure for the year 1983-84.

61. Physical cash count.

62. General.

Appendix - 8.02

Internal Audit Report of the Zia Fertilizer Company Limited for the period from January 1985 to June 1985.

BCIC Head Office Memo. Audit Dept. 311.08(2) 689 dt. 1.10.87.
Reply: ZFCL/Int.Audit/005/178 dt. 26.04.88.

1. Loss of Tk.6,96,213.59 was due to short receipt of Polythene Pellets amounting to 17.113 MT. The amount should be realised from the Insurance company.

2. Goods worth of Tk.1,51,468.72 was given as loan to the Bengal Belting Corporation. The goods were not received, it should be recovered immediately.

3. The cloth for liveries was purchased from a higher bidder at higher rate for which the factory incurred a loss of Tk.36,329.03. According to purchase policy articles should be purchased from the lowest bidder.

4. An amount of Tk.1,60,47,585.56 is lying with the Customs Authority as Customs Duty refundable on account of import of Polythene Pellets. This amount should be realised.

5. Due to the damage of the Boiler feed water pump turbine an amount of Tk.48,93,210.80 was claimed to the Sadharan Bima. These Sadharan Bima has no good intention to pay the same till 01-02-83. It should be realised soon.

6. Advance against TA/DA vouchers and adjustment vouchers are not properly maintained. For this much more labour and stationeries are being wasted. Better system should be followed for the adjustment and settlement of bills.

7. A quantity of 69,000 kg. Potasium Carbonate imported from Korea of which a quantity of 10,550 kg. was short received/damaged causing the factory to incur a loss of Tk.3,16,500.00 (Ref. P.O. No. 1539 dt. 20.02.85). A claim should be lodged with Insurance Company.

8. The factory incurred a loss of Tk.14,800.00 as 148 bags of cement lying in the stonefind condition.

9. In the travelling allowance of the factory an amount of Tk.1,21,153.31 was in excess over the budgeted amount, it should be controlled.

10. 15 MT Polythene Pellets worth of Tk.3,45,702.00 is lying unutilized in the store and going to be damaged. Measures should be taken to dispose it of as per law.

11. Tyres and Tubes of Cars, Electric Generator and Washing Machines worth of Tk.18.50 lacs are lying in the store since the construction of the project began. Goods are being damaged. In order to save the factory from heavy losses, measures should be taken to dispose of the same.

12. In the advance for purchasing upto 30.6.84, an amount of Tk.7,61,492.91 is lying outstanding to the staffs and officers. This amount should be realised/adjusted.

13. Shops let out by the factory in the market, an amount of Tk.1,73,562.05 is lying unrealised as rent. The arear rent should be realised.

14. In violation of the factory rule, an amount of Tk.60.00 was paid as saline pushing charge. The sum is recoverable.

15. Spare parts worth of lacs of Taka are lying unutilized in the Store since the construction of the factory began. Measures should be taken to dispose of the same.

16. Customs Duty paid in excess amounting to Tk.69.82 crores on account of import of spare parts since construction began, has not yet been realised. The amount should be realised.

17. A total number of 16 ceiling fans with regulators were stolen from the factory's residential quarters worth of Tk.16,500.00. No trace of the stolen fans has yet been established.

18. There was a wastage of 1291 Machine hours/Man hours causing a shortfall of 86,000 MT of Urea in the production which can be valued at Tk.33,19,60,000.00 as a result the factory was deprieved of a profit of Tk.23,23,72,000.00.

19. 700 MT Sweeping Urea worth of Tk.26,80,000.00 are lying idle in the godown causing a blockade in the capital which is causing a loss in the interest earning.

20. As on 30.6.86 in the Store-in-Transit, an amount of Tk.5,81,87,772.27 is lying unadjusted. It should be adjusted.

21. An amount of Tk.50,93,542.56 is lying unrealised and unadjusted to different contractors and suppliers. It should be adjusted.

22. The factory suffered a loss of Tk.3,76,200.00 due to the cause that 52 residential accommodation was not let out for a year.

23. Out of 727 MT Polythene Pellets imported from abroad being a quantity of 23869.5 kg. was short received as a result the factory suffered a loss of Tk.4,84,665.87.

24. Regarding irregularity in calculation of overtime bills.

25. Irregularity in books and records of the Transport Department.

26. Payment of insurance premium of the nonworking vehicles lying in the workshop is a loss to the factory.

27. Many articles worth of many lacs of Taka were given as loan to various sister concern of the BCIC through gatepass. Till 1982 these articles have not been recovered. Action should be taken to recover.

28. Hiring charge of the factory vehicles used on payment basis were not realised since January 1985. Realisation of the same should be effected.

29. Advance against travelling bill upto 30.6.85 amounting to Tk.1,24,958.46 is lying unrealised/unadjusted which should be realised/adjusted immediately.

30. Upto 30.6.85 an amount of Tk.2,56,891.97 as advance against salary is lying unrealised/unadjusted. It is necessary to realise/adjust the same.

31. As on 30.6.85 goods worth of Tk.78,59,01,400.16 was lying in the Stores of ZFCL which is excessive. In the stored goods there are many unnecessary items. Arrangement should be made to minimise the same.

32. Medicines worth of Tk.11,629.00 lying in the Stores have expired. This is a loss to the factory.

33. Upto 30.6.85 an amount of Tk.17,12,789.07 is lying unrealised with the Sadharan Bima. Arrange should be made for the settlement of the same.

34. Goods in the different stores of the factory as at 30.6.85 were not physically verified. The physical verification should be done to ascertain the actual position.

35. In the Inter-project transfer, there is an amount of Tk.8,95,03,103.51 is lying which should be realised.

36. Bank Reconciliation Statement.

37. Physical cash count.

38. General.

Appendix - 8.03

Internal Audit Report of the Zia Fertilizer Company Limited for the period from July 1985 to December 1985.

BCIC Head Office Memo: Audit Dept. 311.08(3) 409 dt. 22.6.87.
Reply: ZFCL/Int.Audit/005/138A dt. 09.11.87.

1. Raw materials for the production was used in excess of actual ratio which resulted in the loss of Tk.52,76,060.50 of the factory. Over usage of raw materials should be controlled.

2. Goods imported from abroad amounting to 200 kg. (spare parts) was released from the Airport late for which a demurrage of Tk.1,826.00 was paid (Ref: PCD-269 dt. 6.8.85).

3. Lowest bidder was not given work order in time as such, the supplier did not supply goods. Subsequently an amount of Tk.25,324.00 was spent in excess for purchasing the same at a later date. It is a loss to the factory.

4. 10 pieces of Camring imported from Germany was not supplied as per sample caused a loss of Tk.8,679.00 to the factory. (Source: P.O. No. 1582, dt. 29.10.85).

5. Wire-less set is lying out of orders but royalty and licence fees is being paid. These sets should be surrendered.

6. 69,000 kg. Potasium was imported from Korea of which 10,550 kg. was damaged/short received. The damage/short received is worth of Tk.3,16,500.00. (Source: P.O. No. 1539 dt. 20.2.85).

7. An amount of Tk.580.00 was over paid to Mr. A.M. Joynal Abedin, Assistant Shipping Officer on account of travelling allowance as an irregular. The amount should be realised.

8. On account of rents of Ammonia Gas Cylender due to Bangladesh Blade Factory amounting to Tk.2,54,080.00 is lying unrealised, measures should be taken for realisation.

9. Spare parts/Nut bolts imported from Japan was damaged/short received which resulted in the losses of Tk.1,09,900.00 to the factory. (Source: P.O. No. 1523 dt. 22.11.84).

10. Non-realisation of Gas bill from the officers, employees and workers being in Housing Colony of the factory, caused a loss of Tk.4,95,770.00 for a period from July-December 1985. The amount is recoverable.

11. Inter-project transfer account upto 31.12.85 shows that a huge amount of Taka is lying unrealised which is causing an interest loss of Tk.1,03,69,758.00 for the factory. Measures to realise the amount should be effected immediately.

12. Physical verification of Air Coller, Freeze and Furnitures used in the Housing Colony was not done, and rent of the same was not realised from the users, as such the factory suffered a heavy loss.

13. Fire incidents occured in the Compressor House of the factory many times, which resulted in the closure of the factory for 36 days for which the factory suffered heavy losses, it should be probed by higher authority.

14. Physical verification of the goods lying in the stores was not done, as a result without ascertaining the shortage/excess of goods, the accounts are being maintained. 100% physical verification of the stores should be carried out.

15. On account of advance against travelling bill upto 31.12.85 an amount of Tk.1,84,022.78 is lying unrealised/unadjusted.

16. An amount of Tk.14,24,383.99 on account of insurance claims upto 31-12-85 is lying unrealised/unadjusted. Efforts should be made to realise the same.

17. 200 MT Polythene Pellets imported from abroad of which 90 Bags worth of Tk.19,350.00 was short received. Claim for this amount should be put up before the Insurance Company for realisation of compensation.

18. In the account of advance against purchase, an amount of Tk.50,71,176.00 is lying unrealised/unadjusted from the different officers and employees. Realisation/adjustment should be done.

19. Valuable goods worth of many lacs of Taka was given as loan through gate passes. The goods have not been recovered yet. These should be recovered.

20. An amount of Tk.44,00,401.66 is lying unrealised/unadjusted from the Sundry Debtors of the factory upto 31.12.85. Positive measures should be taken for realization/adjustment.

21. Valuable vehicles and construction materials of the factory are lying unutilized and uncared which caused damage to the articles, resulting in the loss to the factory. Excess vehicles and construction materials should be disposed of.

22. Regarding the theft of 10 Electric Fan from the factory residential quarters.

23. Bank Reconciliation Statement.

24. Cash physical count.

25. General

Appendix - 8.04

Internal Audit Report of the Zia Fertilizer Company Limited for the period from January 1986 to June 1986

BCIC Head Office : Audit dept. 311.08(4)89 dt. 12.1.88.
Reply : Not yet received.

1. 7 Nos. of Tong Tester purchased from the market without calling for quotation has caused financial loss of Tk.56,000.00. Justification should be called for.

2. The factory suffered a loss of Tk.4,97,975.00 for the purchase of chart paper worth of Tk.6,33,225.00 on irregular way.

3. The factory incurred a loss of Tk.1,00,741.00 for the refund of the earnest money of M/S. Abu Bakr Siddique.

4. Purchase order was given to the highest bidder in place of the lowest bidder which resulted in the loss of Tk.8,726.00. The amount is recoverable from the incumbent officer.

5. Regarding the work and progress of the MPIC Department.

6. Arrangement for purchase principles and record keeping.

7. An amount of Tk.1,29,959.93 is lying unadjusted/unrealised since 1980-81 on account of contractor Royal Utilization Services. Realisation/adjustment should be done.

8. Refundable goods given out through gate passes, have not been recovered after a long period of time. No action for recovering has been taken so far.

9. Physical verification of goods stored in the Store Department of the factory is yet incomplete.

10. Duty paid against the import of 50 MT of Liner Loadensity Polythene Pellets amounting to Tk.8,47,189.02 which is refundable has not been realised till now from the Customs Authority.

11. Of the 1,67,000 kg. Polythene Pellets imported from Poland 4,705 kg. was short received for which the factory suffered loss of Tk.1,90,600.00.

12. Duty and Sales Tax amounting to Tk.69.82 crores paid in excess by Zia Fertilizer Company Limited has not been recovered. Necessary measures for the realization should be taken.

13. An amount of Tk.1,89,985.07 has been paid to only 20 employees for a period of 6 months from January 1986 to June 1986 which appears to be irregular and in all cases the overtime has been paid at a rate 2/3 times higher than salary should be controlled.

14. There is an irregularity found in the payment of travelling bill to the factory employees. Amount paid in excess should be realised.

15. 1000 MT of waste/sweeping Urea is lying unutilized in the bagging godown which has caused the factory to incur a loss of Tk.3,60,000/.

16. 20 MT Polythene Pellets worth of Tk.7,25,000.00 has been damaged due to the lack of care has caused a loss to the factory.

17. An amount of Tk.9,62,174.55 as Marine Insurance claim has not been realised. Steps for realisation, should be taken up.

18. Insurance claim of Tk.48,93,210.00 is being unrealised. Realisation should be carried out.

19. Insurance claim for Tk.66,43,290.00 is lying unrealised. Realisation should be effected soon.

20. During 1985-86 a total 1307.15 labour hours were wasted causing a shortfall in production of 81,915 MT of fertilizer worth of Tk.33,21,37,000.00. In the future, wastage of labour hours should be reduced.

21. During the year 1985-86 a quantity of 271.82 MT of Urea was lost in transit while loading on barge.

22. During the year 1985-86 a quantity of 4,25,329.24 MT of Urea in its production process, chemicals were in excess use, which resulted in the excess expenses of Tk.3,12,12,097.95 over the budget.

23. Physical verification of 6 items of the chemical groups was performed and there was irregularities found. Necessary action should be taken.

24. An amount of Tk.3,79,339.00 is lying unrealised from 13 persons as advance against purchase upto 30.6.86. Steps for adjusting the same should be taken.

25. An amount of advance against salary of the officers and staffs of the factory amounting to Tk.14,34,297.40 upto 30.6.86 is lying unrealised.

26. An amount of advance against TA/DA of the officers/staffs of the factory is lying unrealised amounting to Tk.1,24,182.83 upto 30.6.86. Realisation should be effected.

27. Recommendations are made to the effect that gas, electricity and furniture charge and rent should be realised from the officers, staffs and workers of the factory as per rule of the corporation.

28. Advances made to the suppliers upto 30.6.86 amounting to Tk.34,73,610.69 is lying unrealised. Effective steps should be taken for the realisation.

29. Upto 30.6.86 a large amount of lying unrealised on account of debtors and others. Steps for realisation should be taken.

30. Non-realisation rents of factory owned market amounting to Tk.45,044.77 is lying unrealised. It should be realised.

31. There is an irregularity found in the purchase of goods worth of Tk.72,609.00. No appropriate action has been taken against the suppliers as a result there is a loss to the factory.

32. Irregularities in the adjustment of advances.

33. An amount of Tk.37,633.18 was debited which requires proper verification.

34. An advance amounting to Tk.20,149.50 is lying with Mr. Mostafa Hossain, Assistant Purchase Officer till 30.6.86 unrealised. Measures should be taken for realisation.

35. There is progress in the reconciliation of the Head Office's current account.

36. The factory incurred a loss of Tk.14,800.00 as 148 bags of cement lying in the Stone find condition.

37. An amount of Tk.136.59 lacs has been spent in excess of budget allocation during the year 1985-86.

38. Bank Reconciliation Statement.

39. Cash physical count.

40. General.

BIBLIOGRAPHY

1. Abdullah, A.A., "Distributional Aspects of the Fertilizer Pricing Policy", The Bangladesh Development Studies, Vol.XIV, No.1, (Dhaka: The Bangladesh Institute of Development Studies, 1986).

2. _____, "The Fertilizer Subsidy - Cost and Returns", The Bangladesh Development Studies, Vol.XIII, No.3&4, (Dhaka: The Bangladesh Institute of Development Studies, 1985).

3. Abdullah, A.S.M., "Cost Report as an Aid to Cost Control", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1981).

4. _____, "Analysis and Evaluation of Standards and Budgets as Cost Control Devices", The Dhaka University Studies, Part-C, (Dhaka: University of Dhaka, 1980).

5. _____, "Inventory Management", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1980).

6. _____, "A Critical Evaluation of Integrated Accounting System Practised in Textile Mills in Bangladesh", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1979).

7. Afzal, Md. Anwarul, "Diagnosis and Remedies : The Public Sector Sickness", The Bangladesh Observer, (Dhaka: 8th February, 1987).

8. Ahmed, Hamid Uddin, "Inventory Management and Control", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parisad, 1981).

9. Ahmed, Mahbub, Evaluation of Financial Statement as a Communication Device in Bangladesh, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1982).

10. Ahmed, Muzaffar, "The Prospects and Problems of Nationalised Industries", Management, Business and Economics, (Dhaka: The Institute of Business Administration, 1975).

11. _____, "Development Planning and Public Sector Enterprises in Bangladesh", Management, Business and Economics, Vol.1, No.2, (Dhaka: The Institute of Business Administration, 1975).

12. Ahmed, Muzaffar, "Cost Reduction by Value Analysis", The Cost and Management, (Dhaka: Institute of Cost and Management Accountants of Bangladesh, 1982).

13. Ahmed, Q. Kholiquzzaman, "The Jute Manufacturing Industry of Bangladesh 1947-1974", Unpublished Ph.D. Thesis, (London, 1976).

14. _____, "The Management of Nationalised Industries Sector in Bangladesh : Some Comments on the First Five Year Plan Proposals", Political Economy, Vol.1, No.1, (Dhaka: Bangladesh Economic Association, 1974).

15. _____, "An Analysis of the Profitability of the Jute Manufacturing Industry of Bangladesh in the Post-Liberation Period, Research Report No.10, (Dhaka: The Bangladesh Institute of Development Studies, 1973).

16. _____, "A Note on Capacity Utilisation in the Jute Manufacturing Industry of Bangladesh", The Bangladesh Economic Review, Vol.1, No.1, (Dhaka: The Bangladesh Institute of Development Studies, 1973).

17. Ahmed, Q. Kholiquzzaman and Chowdhury, Anwaruzzaman, "What has been happening to productivity in manufacturing sector of Bangladesh ? A Case Study of Selected Industries", (Dhaka: The Bangladesh Institute of Development Studies, 1972).

18. Ahmed, Raisuddin, "Price Support versus Fertilizer Subsidy for Increasing Rice Production in Bangladesh," The Bangladesh Development Studies, Vol.VI, No.2, (Dhaka: The Bangladesh Institute of Development Studies, 1978).

19. Ahmed, Z.U., "Social Cost-Benefit Analysis", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1984).

20. _____, "Cost Reduction with Special Reference to Jute Mills", The Business Review, (Dhaka: University of Dhaka, 1978).

21. Alagh, Yoginder, K., "Pricing Planning and Strategy in Public Enterprises", Public Enterprises, (Ljubljana: International Center for Public Enterprises in Developing Countries, 1987).

22. Alamgir, Mohiuddin, "Some Aspects of Bangladesh Agriculture: Review of Performance and Evaluation of Policies", The Bangladesh Development Studies, Vol.3, No.3, (Dhaka: The Bangladesh Institute of Development Studies, 1975).

23. Alamgir, Mohiuddin, and Berlage, L.J., "Foodgrain (Rice and Wheat) Demand, Import and Price Policy for Bangladesh", The Bangladesh Economic Review, (Dhaka: The Bangladesh Institute of Development Economics, vol.1, No.1, 1973).

24. Ali, A., "Problems of Wage and Salary Administration", Management Development, (Dhaka: The Bangladesh Management Development Centre, 1972).

25. Ali, Md. Omar, "Least Cost Production - With Reference to Bangladesh", Maneggiare, (Chittagong: University of Chittagong, 1980).

26. Ali, Muhammad Raushan, Achievement Motivation and Industrial Productivity in Bangladesh, (Dhaka: University of Dhaka, 1979).

27. Alimullah, K., Inventory Management in East Pakistan, (Dhaka University: Bureau of Economic Research, 1970).

28. Amanullah, Mohammad, "Human Problems of Management", Management Development, (Dhaka: The Bangladesh Management Development Centre, 1972).

29. Amarchand, D., "Management Development and Training : Its Role in Public Enterprises Development", Management Development and Training in Public Enterprises, (New Delhi: Ajanta Publications, 1983).

30. American Accounting Association, The Accounting Review, Vol.xxvii, No.2.

31. American Economic Foundation, "Lowering Costs through Human Engineering".

32. American Institute of Certified Public Accountants, Accounting Terminology Bulletin No.4, (USA: 1977).

33. Anderson, Henry R., and Raiborn, Mitchel H., Basic Cost Accounting Concepts, (Boston: Houghton Mifflin Company, 1977).

34. Anthony, Robert N., Management Accounting Principles, (Illinois: Richard D. Irwin, Inc., 1970).

35. _____, Planning and Control System : A Frame for Analysis, (Boston: Harvard University, 1965).

36. Anthony and Walsch, Fundamentals of Management Accounting, (Illinois: Richard D. Irwin, Inc., 1974).

37. Aphiluddin, Md., "Being Cost Minded", The Bangladesh Observer, (Dhaka: December 9, 1986).

38. _____, "Controlling through Budgeting", The Cost and Management, (Dhaka: The Institute of Cost and Management Accountants of Bangladesh, 1982).

39. Argyris, Chvis, The Impact of Budget on People, (New York: The Controllership Foundation, 1952).

40. Arora, S.P., and Soni, T.S., Cost Accounting, (New Delhi: Pitamber Publishing Company, 1983).

41. Asian Development Bank, Agriculture in Asia : Statistical Appendices, (Manila: 1985).

42. Asian Development Bank, Rural Development in Asia and Pacific, (Manila: 1984).

43. _____, Appraisal of the Chittagong Urea Fertilizer Project in the People's Republic of Bangladesh (Dhaka: (Dhaka: 1981).

44. _____, Appraisal of Ashugonj Fertilizer Project in the People's Republic of Bangladesh, (Dhaka: 1975).

45. Azim, Hasem, M. Anwarul, Masud, Syed and Khan, Shamsul Hoque, "Industrial Operation Towards High Efficiency", Management Development, (Dhaka: The Bangladesh Management Development Centre, 1981).

46. Bakar, Shaikh Abu, "Inventory Management in Jute Mills under Khulna Zone in Bangladesh for the period from 1973-74 to 1981-82", unpublished Ph.D. Thesis, (Rajshahi University, 1987).

47. Backer, Morton, and Jacobsen, Lyle E., Cost Accounting : A Managerial Approach, (New York: McGraw-Hill Book Company, 1964).

48. Bakht, Zahid and Rahman, Siddiqur, "Comparative Cost Structure — A Study of Selected Manufacturing Industries of Bangladesh", (Dhaka: The Bangladesh Institute of Development Studies, 1974).

49. Bangladesh Agricultural Development Corporation, Twenty Five Years of BADC : 1961 to 1986, (Dhaka: 1986).

50. _____, Fertilizer Newsletter (Monthly), (Dhaka: Upto June, 1986).

51. Bangladesh Chemical Industries Corporation, Ten Years of BCIC, (Dhaka: 1986).

52. _____, Annual Report, (Ten Years upto 1985-86), (Dhaka).

53. Bansil, P.C., Agricultural Problems of India, (New Delhi: Oxford & IBH Publishing Co., 1981).

54. Basu, B.K., An Insight into Auditing, (Calcutta: Book Syndicate Private Limited, 1981).

55. _____, Lectures on Management Accountancy, (Calcutta: Chatterjee Publishing Concern, 1979).

56. _____, "Cost Control", Survey, A Journal of the Indian Institute of Social Welfare and Business Management, (Calcutta: May, 1974).

57. Battey, J., (edited), Cost and Management Accounting for Students (New Delhi: Allied Publishers Private Limited, 1980).

58. Baquer, A.A.M., "Management for Self Reliance", The Dhaka University Studies, Part-C, Vol.2, No.1, (Dhaka: University of Dhaka, 1981).

59. Beaman, D. Stewart, and Laryea, Henry Okai, "Financial Aspects of Departmental Management-II", The Industrial Accountant, (Karachi: The Pakistan Institute of Industrial Accountants, 1971).

60. Becker, S., and Green, D., "Budgeting and Employee Behavior", Readings in Cost Accounting, Budgeting and Control, (Bombay: D.B. Taraorevala Sons & Co., 1970).

61. Beckett, John A., "The Art and the Science of Distribution Costing", NACA Bulletin, (USA: National Association of Cost Accountants, 1951).

62. Berudt, E.R., and Hesse, D.M., "Measuring and Assessing Capacity Utilisation in the Manufacturing Sector of Nine OECD Countries" European Economic Review, Vol.30, Oct. 1986.

63. Bhalla, G.S., "Theory and Practice in Public Enterprise Pricing – The Indian Experience", paper presented in the National Seminar of the Institute of Public Enterprise, (Hyderabad: March, 1982).

64. Bhattacharjee, Durgadas, "Managerial Performance of the Public Sectory Industry : A Review of Concepts and Trends of Performance of the Sugar Industry in Bangladesh", The Dhaka University Studies, Part-C, (Dhaka: University of Dhaka, 1985).

65. Bhattacharjee, Haripada, "Distribution Cost Accounting - Analysis and Measurement Techniques", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountant of Bangladesh, 1986).

66. Bhattacharyya, D.P., "Cost Control and Cost Reduction under Inflation", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the Institute of Cost and Management Accountants of Bangladesh, (Dhaka: 1981).

67. Bierman, Harold, and Dyckman, Thomas R., Managerial Cost Accounting, (New York: Macmillan Publishing Co., Inc., 1976).

68. Brown, J.L., and Howard, L.R., Managerial Accounting and Finance, (Estover: McDonald & Evans Ltd., 1984).

69. Burke, Ronald S., ICPM : Administrative Skills for the Managers, (Illinois: Dow Jones - Irwin, 1983).

70. Cashin, James A., and Polimeni, Ralph S., Cost Accounting, (London: McGraw-Hill International Book Company, 1981).

71. Cecil, Gillespie, Cost Accounting and Control, (Englewood Cliffs, 1957).

72. Centre for Development Science, Fertilizer Price Decontrol Study, (Dhaka: 1984).

73. Chakraborty, Hrishikesh, Management Accountancy, (Calcutta: Nababharat Publishers, 1977).

74. Chandra, Durgesh, Dynamics of Productivity, (New Delhi: South Asian Publishers Ltd., 1980).

75. Chatterjee, B.K., Marketing Management, (Bombay: Jaico Publishing House, 1982).

76. Chatterjee, B.K., Accounting and Finance for Managers, (Bombay: Jaico Publishing House, 1977).

77. China Hand Book Series : Economy, (Beijing: Foreign Languages Press, 1984).

78. Chowdhury, A.Momin, "A Method for Designing an Incentive System for the Jute Industry of Bangladesh in Particular and for the Nationalised Industries in General", unpublished Ph.D. Thesis, (Dhaka: University of Dhaka, 1981).

79. Chowdhury, G.S., "Managerial Problems of Nationalised Industries in Bangladesh", Management Development, (Dhaka: Bangladesh Management Development Centre, 1977).

80. Chowdhury, Nuimuddin, "A Social Cost-Benefit Analysis of the Tea Industry of Bangladesh", (Dhaka: The Bangladesh Institute of Development Studies, 1975).

81. Chowdhury, S.A., "Some thoughts on the Prevailing Industrial Policy of Bangladesh", Management Development, (Dhaka: Bangladesh Management Development Centre, 1983).

82. Chowdhury, S.K., "Selective Inventory Control", The Management Accounting, (1974).

83. Christensen, R.W., and Stevens, R., "How United States Improved Its Agriculture", USDA, ERS Foreign Agricultural Economic Report, No.76, (Washington, D.C., 1964).

84. Clarence, L., VanSickle, Cost Accounting, (New York: 1948).

85. Collier's Encyclopedia, Volume 8, (New York: 1956).

86. Couston, J.W., "Focus : Implications of Crop and Fertilizer Price Relationships in Developing Countries", (Nairobi: 1986).

87. Copeland, Ronald M., and Dascher, Paul E., Management Accounting, (New York: John Wiley & Sons, 1978).

88. Copell, Don F., Work Simplification Training, (USA: American Management Association, 1945).

89. Council for Agricultural Science and Technology, The U.S. Fertilizer Situation and Outlook, (Iowa: Iowa State University Press, 1974).

90. Crowningshield, Gerald R., Cost Accounting : Principles and Managerial Applications, (Boston: Houghton Miffin Company, 1979).

91. Daies, J.R., and Hughes, S., Managerial Economics, (Estover: Macdonald and Evans, 1977).

92. Dale, Ernest, Management: Theory and Practice, (New York: McGraw-Hill Book Company, 1973).

93. Davis, Ralph Currier, Industrial Organisation and Management, (New York: Harper & Brothers, 1957).

94. Deakin, E.B. and Maher, M.W., Cost Accounting, (Illinois: Richard D. Irwin, Inc., 1984).

95. Dean, Joel, "Cost Forecasting Price Policy", The Journal of Marketing, (1949).

96. Decoster, and Fertakis, "Budget Induced Pressure and Its Relationship to Supervisory Behavior", Journal of Accounting Research, 1968.

97. Desai, Gunvant M., Growth of Fertilizer Use in Indian Agriculture: Past Trends and Future Demand, (New York: Cornell University, 1968).

98. Dewett, K.K. and Chand, Adarsha, Modern Economic Theory, (New Delhi: Shyam Lal Charitable Trust, 1984).

99. Dlugatch, Irving, Dynamic Cost Reduction, (New York: A Ronald Press Publication, John Wiley & Sons, 1979).

100. Dobson, R.W., An Introduction to Cost Accounting, (London: Gee & Co., 1971).

101. Eckles, R.W., Carmichael, R.L., and Sarchet, R.R., Supervisory Management, (New York: John Wiley & Sons, 1981).

102. Eilon, Samuel, Management Control, (Oxford: Pergamon Press, 1979).

103. Fernandes, Praxy, (editor), Control Systems for Public Enterprises in Developing Countries, (Ljubljana: International Center for Public Enterprises in Developing Countries, 1982).

104. Fitzmaurice, E.F., "The Essence of Control- What It is and who does it", The Controller, (New York: The Controllers Institute of America, 1950).

105. Food and Agriculture Organisation of the United Nations, 1984 FAO Fertilizer Year Book, (Rome: 1985).

106. _____, Maximizing Fertilizer Use Efficiency, (Rome: 1983).

107. _____, Crop Production Levels and Fertilizer Use, (Rome: 1981).

108. Fuchs, Jerome H., Computerized Cost Control Systems, (New Jersey: Prentice-Hall, Inc., 1976).

109. Funk & Wagualls New Encyclopedia, Volume 9.

110. Gaynor, Edwin W., "Use of Control Charts in Cost Control", NACA Bulletin, (USA: National Association of Cost Accountants, 1954).

111. Gedye, Rupert, Works Management and Productivity, (New Delhi: Allied Publishers, 1980).

112. Ghosh, Sailendranath, "Fertilizer Technology : Fractured Profile of Self-Reliance", Economic and Political Weekly, (Bombay: Vol.xxi, No.16, April 19, 1986).

113. Gilbert, R. Neal, "Operational Auditing Checks Effectiveness", Cost Containment in Hospitals, (London: Aspen Systems Corporation, 1980).

114. Glueck, William F., Management, (Illinois: The Dryden Press Hinsdale, 1980).

115. Goetz, Billy E., Role of Costs in Managerial Planning and Control, (Chicago: SAM Publication, 1947).

116. Gorder, H.F. Van, "Clerical Cost Control", NACA Bulletin, (USA: National Association of Cost Accountants, 1947).

117. Gordon, Myron J., "Cost Allocations and the Design of Accounting Systems for Control", The Accounting Review, (USA: American Accounting Association, 1951).

118. Government of the People's Republic of Bangladesh, Statistical Pocket Book of Bangladesh 1987, (Dhaka: Bureau of Statistics, 1988).

119. _____, 1986 : Statistical Year Book of Bangladesh, (Dhaka: Bureau of Statistics).

120. _____, Industrial Policy - 1986, (Dhaka: Ministry of Industries, 1986).

121. _____, Autonomous Bodies Budgets 1986-87, (Dhaka: Ministry of Finance, 1986).

122. _____, The Third Five Year Plan : 1985-90, (Dhaka: The Planning Commission, 1985).

123. _____, The Second Five Year Plan : 1980-85, (Dhaka: The Planning Commission, 1980).

124. _____, The First Five Year Plan, (Dhaka: The Planning Commission, 1973).

125. _____, Industrial Worker's Wage and Productivity Commission, (Dhaka: 1978).

126. Government of India, India 1986 : A Reference Annual, (New Delhi: Ministry of Information and Broadcasting).

127. Gray, Jack, and Ricketts, Don, Cost and Managerial Accounting, (New York: McGraw-Hill Book Company, 1982).

128. Greer, Howard Clark, "Cost Factors in Price-Making", The Harvard Business Review, (1952).

129. Grillo, Elmer V., Control Techniques for Office Efficiency, (New York: MacGraw-Hill Book Company, 1963).

130. Gul Afroz and Dilip Kumar Roy, "Capacity Utilization in Selected Manufacturing Industries of Bangladesh", The Bangladesh Development Studies, Vol.IV, No.2, (Dhaka: Bangladesh Institute of Development Studies, 1976).

131. Gupta, N.S., Principles and Practice of Management, (New Delhi: (Light & Life Publishers, 1979).

132. Habibullah, M., "Health Economics and Health Costs", The Dhaka University Studies, Part-C, (Dhaka: 1984).

133. _____, "Making Employees Cost-Minded", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the Institute of Cost and Management Accountants of Bangladesh, (Dhaka: 1981).

134. _____, Cost Structure of the Jute Industry in Bangladesh, (Dhaka University: Bureau of Economic Research, 1979).

135. _____, "Balancing Organisational Goals", The Dhaka University Studies, Part-A, (Dhaka: 1977).

136. _____, "Manpower Accounting", The Accountant, (Dhaka: Bangladesh Chartered Accountancy ChatraParisad, 1975).

137. _____, Industrial Efficiency and Profitability in Bangladesh, (Dhaka University: Bureau of Economic Research, 1974).

138. _____, Motivation Mix, (Dhaka University: Bureau of Economic Research, 1974).

139. _____, "Human Aspects of Accounting", The Dhaka University Studies, Part-A, (Dhaka: 1974).

140. _____, "Selling and Distribution Costs : A Study of Bangladesh Jute Industry", The Dhaka University Studies, Part-A, (Dhaka: 1973).

141. _____, "Accounting as a Tool of Solving Business Problems in a Developing Economy", The Dhaka University Studies, Part-A, (Dhaka: 1972).

142. _____, "A Case for Responsibility Accounting", The Industrial Accounting, (Karachi: The Pakistan Institute of Industrial Accountants, 1971).

143. _____, "Problems of Productivity in the Jute Industry of Pakistan", The Dhaka University Studies, Part-A, (Dhaka: 1969).

144. _____, Tea Industry of Pakistan, (Dhaka University: Bureau of Economic Research, 1964).

145. Habibullah, M., and Ahmed, Mahbub, Environmental Factors Affecting Operational Effectiveness of Nationalised Industries, (Dhaka: UNDP-ILO, National Management Development Programme, 1982).

146. Habibullah, M., Ghosh S.N. and Quddus, Management Motivation through Result-Based-Reward System, (Dhaka: UNDP-ILO, National Management Development Programme, 1981).

147. Habibullah, M., Ghosh, S.N., Helaluzzaman, A.K.M., Quddus M.A., and Chowdhury, M.H., A Study of Government Subsidy to Fertilizer, (Dhaka: Planning Commission, 1980).

148. Halder, P.K., "Analysis for Harmonizing between Two Extreme View of a Sheet of Balances and Going Concern Concept of Balance Sheet", unpublished Ph.D. Thesis, (Calcutta University, 1987).

149. Hamid, Abdul, "Issues and Problems of Personnel Management", Management Development, (Dhaka: Bangladesh Institute of Development Studies, 1983).

150. Hasan, M.N., "Cost Control and Cost Reduction under Inflation", paper presented in 'Cost Control and Cost Reduction' conference sponsored by the Institute of Cost and Management Accountants of Bangladesh, (Dhaka: 1981).

151. _____, "Cost and Budgetary Control Needed in Jute Industry", The Cost and Management, (Dhaka: The Institute of Cost and Management Accountants of Bangladesh, 1978).

152. Hashem, M. Abul, "Cost Control and Cost Reduction", The Cost and Management, (Dhaka: The Institute of Cost and Management Accountants of Bangladesh, 1979).

153. Harris, Richard, and Taylor, Jim, "The Measurement of Capacity Utilization", Applied Economics, (1985).

154. Harper, W.M., Cost Accounting, (London: Macdonald and Evans, 1977).

155. Hartley, Ronald V., Cost and Managerial Accounting, (USA: Allyn and Bacon Inc., 1983).

156. Haque, Anwarul, "System of Internal and External Control of Public Sector Industrial Enterprises in Bangladesh", Control Systems for Public Enterprises in Developing Countries, (Ljubijana: International Center for Public Enterprises in Developing Countries, 1982).

157. Haque, Mohammad Nurul, "Accounting - An Instrument of Control", Management Development, (Dhaka: Bangladesh Management Development Centre, 1977).

158. Heitger, L.E., Matulich, S., and Var, T., Managerial Accounting, (Canada: McGraw-Hill Ryerson Limited, 1983).

159. Henrici, Stanley B., Standard Costs for Manufacturing, (New York: McGraw-Hill Book Company Inc., 1947).

160. Hermanson, Roger H., Loe' Stephen E., and Strawser, Robert H., Auditing Theory and ctice, (Homewood: Richard D. Irwin, Inc., 1983).

161. Herzlinger, Regina E., and Calkins, David, "How Companies Tackle Health Care Costs : Part III, Harvard Business Review, Massachusetts: 1985).

162. Heyel, Carl (edited), The Encyclopedia of Management, (New York: Van Mostrand Reinhold Company, 1982).

163. Holmes, Arthur W., Basic Auditing Principles, (Homewood: Richard D. Irwin, Inc., 1970).

164. Hoque, Khandoker Baziul, "Some thoughts on the Development of Sugar Inventory in Bangladesh : Problems and Possibilities", The Dhaka University Studies, Part-C, (Dhaka: 1984).

165. Hoque, M. Mazammel, "Taxation Policy - as a Means of Domestic Resource Mobilisation", (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1985).

166. Hoque, Md. Jahirul, "Financial Planning and Control in the Public Sector Industries in Bangladesh", unpublished Ph.D. Thesis, (Dhaka University, 1981).

167. Horngren, Charles, T., Cost Accounting : A Managerial Emphasis, (USA: Prentice-Hall International, 1982).

168. Hossain, A.K.M., Mosharraf, "Fertilizer Industry : Blueprint for Tomorrow", The Bangladesh Observer, (Dhaka: 26th February, 1987).

169. _____, "Management of Public Enterprises", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parisad, 1983).

170. Hossain, Kobbad, "Fertilizer Strategies for Rice Production", proceedings of the workshop on 'Experiences with Modern Rice Cultivation in Bangladesh' held at the Bangladesh Rice Research Institute, Dhaka, March 1983.

171. Hossain, M. Mokarram, "A Study of Capacity Utilization in the Jute Mills of Khulna Zone : Its Effect on Volume, Cost of Production and Profitability", (Rajshahi University, 1987).

172. Hossain, Mahbub, "Price Response of Fertilizer Demand in Bangladesh", The Bangladesh Development Studies, Vol.xiii, No.3&4, (Dhaka: The Bangladesh Institute of Development Studies, 1985).

173. _____, "Agricultural Development in Bangladesh : A Historical Perspective", The Bangladesh Development Studies, Vol.XII, No.4, (Dhaka: The Bangladesh Institute of Development Studies, 1984).

174. _____, "Foodgrain Production in Bangladesh: Performance, Potential and Constraints", The Bangladesh Development Studies, Vol.viii, No.1&2, (Dhaka: The Bangladesh Institute of Development Studies, 1980).

175. Hossain, Mahbub, and Quasem, M.A., "Growth of Fertilizer Consumption in Two Villages of Bangladesh 1977-84", The Bangladesh Development Studies, Vol.XIV, No.1, (Dhaka: The Bangladesh Institute of Development Studies, 1986).

176. Howell, Robert A., and Soucy, Stephen R., "Cost Accounting in the New Manufacturing Environment", Management Accounting, (New Jersey: National Association of Accountants, 1987).

177. Husain, Syed Masud , Cost Audit : A Study in the Jute Industry of Bangladesh, (Dhaka University: Bureau of Business Research, 1985).

178. _____, "An Analysis of the Depreciation Cost in Bangladesh Jute Mills Corporation", The Dhaka University Studies, Part-C, (Dhaka: 1985).

179. Hussain, Abid, "Public Sector - Need for Reform", The Daily News, (Dhaka: 24th January 1988).

180. Hye, M.A., "Acceptance and Use of Budget by Managers of Nationalised Industrial Enterprises in Bangladesh", unpublished Ph.D. Thesis, (Dhaka University, 1982).

181. Hye, M., Hoque, M.J., Loqman, M., and Mahmud, M.M., "Idle Capacity in the Jute Mills of Bangladesh", (Chittagong University, Bureau of Business Research, 1979).

182. Institute of Cost and Works Accountants, An Introduction to Budgetary Control Standard Costing Material Control and Production Control, (London: 1950).

183. _____, Cost Reduction, (London, 1956).

184. Institute of Internal Auditors, Survey of Internal Auditing, 1968, Research Committee Report No.15, (New York: 1969).

185. International Fertilizer Development Center, Bangladesh Policy Options for the Development of the Fertilizer Sector, (Alabama, 1983).

186. _____, The Evaluation of the Bangladesh New Marketing System, (Alabama, 1982).

187. Islam, M.N., "Manpower Planning for Industrialization", Management Development, (Dhaka: Bangladesh Management Development Centre, 1972).

188. _____, "Quality Control - A Production Tool", Management Development, (Dhaka: Bangladesh Management Development Centre, 1972).

189. Islam, Rizanul, "Foodgrain Procurement, Input Subsidy and the Public Food Distribution System in Bangladesh : An Analysis of the Policy Package", The Bangladesh Development Studies, Vol.viii, No.1&2, (Dhaka: The Bangladesh Institute of Development Studies, 1980).

190. Iyer, Ramaswamy R., "Control Systems for Public Enterprises in Indus", Control Syster for Public Enterprises in Developing Countries, (Ljubljana: International Center for Public Enterprises in Developing Countries, 1982).

191. Jackson, J. Nugh, "Cost Accounting in the Education of Management", NACA Bulletin, (USA: National Association of Cost Accountants, 1946)

192. Jha, Dayanatha, and Sarim, Rakesh, "An Analysis of Levels, Patterns and Determinants of Fertilizer Use on Farms in Selected Regions of Semi-Arid Tropical India", (Andhra Pradesh: International Crops Research Institute for the Semi-Arid Tropics, 1981).

193. Johannasen, Hano, and Page, G. Terry, The International Dictionary of Business, (New Jersey: Prentice-Hall Inc., 1981).

194. Kappor, M.C., "Review of Researches on Marketing Management in Public Enterprises", paper presented in the National Seminar of the Institute of Public Enterprises, Hyderabad in March, 1982.

195. Kast, Fremont E., and Roseuzweing, James E., Organisation and Management, (New York: McGraw-Hill Book Company, 1979).

196. Keller, I. Wayne, "The Critical Areas of Material Cost Control", NACA Bulletin, (USA: National Association of Cost Accountants, 1948).

197. Kelly, E.W., "Marketing Needs Cost Control", The Controller, (USA: The Controllers Institute of America, 1953).

198. Keshava, G.P., "Information Needs for Research in Public Enterprises", paper presented in the National Seminar of the Institute of Public Enterprise, Hyderabad, March, 1982.

199. Khalid, A.B.M., "Effective Management through Accounting Aids", The Dhaka University Studies, Part-A, (Dhaka: 1976).

200. Khan, Alimullah, "Project Management in Bangladesh", Management Development, (Dhaka: The Bangladesh Management Development Centre, 1978).

201. Khan, Azizur Rahman, "A Study into the Causes of High Cost of Production of Manufactured Goods in Bangladesh", The Dhaka University Studies, Part-A, (Dhaka: 1974).

202. Khan, Md. Abbas Ali, "Government Policies Towards Labour in Bangladesh : A Historical Analysis", The Dhaka University Studies, Part-C, Vol.VII, No.2, (Dhaka: 1986).

203. Khan, Md. Muinuddin, "An Evaluation of Accounting Practices in Bangladesh", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1984).

204. Khan, R.A., and Heady, E.O., "Martinal Rates of Fertilizer Substitution for Land Derived from Experimental Production Function", (Islamabad, USAID, 1972).

205. Khanna, B.S., and Bansal, S.K., "Motivation through Responsibility Accounting", The Management Accountant, May, 1985.

206. Khera, S.S., "Public Sector Management", Management in Government, (New Delhi: Government of India, Ministry of Information and Broadcasting, 1979).

207. Killer, J.W., and Ferrara, W.L., Management Accounting for Profit Control, (New Delhi: McGraw-Hill Inc., 1966).

208. Kirkland, Don, "Cost Systems : How to Develop Them Effectively", Hand Book of Business Problem Solving, (New York: McGraw-Hill Company, 1980).

209. Kobayashi, Eiji, "Some Measures to Increase Foodgrain Production in India", Agricultural Policy and Food Self-Sufficiency, (New Delhi: Associate Publishing House, 1970).

210. Kohler, Eric L., A Dictionary for Accountant.

211. Lexicon Universal Encyclopedia, Vol.8/F, (New York: Lexion Publications Inc., 1983).

212. Lipman, Burton E., Successful Cost Reduction and Control, (Englewood Cliffs: Prentice-Hall Inc., 1978).

213. Lipsky, D., "Dimensional Principle in the Analysis of Variance", NAA Bulletin, (USA: National Association of Accountants, 1960).

214. Longenecker, Justin G., Principles of Management and Organisational Behaviour, (Ohio: Charles E. Merrill Publishing Co., 1977).

215. Loqman, Md., "Management Use of Accounting Information in Financial Decisions and Control of Nationalised Industries in Bangladesh", unpublished Ph.D. Thesis, (Dhaka University, 1984).

216. Lucas, D. Paul, Accounting Desk Book for Manufacturing Companies, (Englewood Cliff: Prentice-Hall, Inc., 1979).

217. Lynch, Richard M., and Williamson, Robert W., Accounting for Management : Planning and Control, (New York: McGraw-Hill Book Company, 1983).

218. Magee, C.C., Financial Accounting and Control, (London: George Allen and Unwin Ltd., 1968).

219. Mahmud, Monjur Morshed, "Accountability of Public Industrial Enterprises in Bangladesh", unpublished Ph.D. Thesis, (Chittagong University, 1984).

220. Mahmud, Wahiduddin, "Development Strategy and the Problem of Food Supply in Bangladesh", The Bangladesh Development Studies, Vol.viii, No.1&2, (Dhaka: The Bangladesh Institute of Development Studies, 1980).

221. Mallik, Enayet H., "The Need Function of Inspection in Industry", Management Development, (Dhaka: Bangladesh Management Development Centre, 1972).

222. Mallya, N.N., Public Enterprises in India, (New Delhi: National Publishing House, 1971).

223. Manik, M. Waheeduzzaman, "Managing Human Resources for Organizational Productivity : A Diagnostic Approach", Management Development, (Dhaka: Bangladesh Management Development Centre 1984).

224. Matz, Adolph, and Usry, Milton, Cost Accounting : Planning and Control, (USA: South-Western Publishing Co., 1980).

225. McCullers, Levis D., & Daniker, R.P. Van, Introduction to Financial Accounting, (California: MeLville Publishing Company, 1975).

226. McNesby, E.J,, "Basic Cost Concepts and Terminology", Controller's Hand Book, (Illinois: Down Jones-Irwin, 1978).

227. Meigs, Walter B., Whittington, O. Ray, and Meigs, Robert F., Principles of Auditing, (Homewood: Richard D. Irwin Inc., 1982).

228. Miah, Md. Uttam Ali, "Why Cost Control and How to Control", paper presented in 'Cost Control and Cost Reduction' seminar sponsored by the Institute of Cost and Management Accountants of Bangladesh, (Dhaka: 1981).

229. _____, "Budget and Budgetary Control in Industrial Enterprises", The Cost and Management, (Dhaka: The Institute of Cost and Management Accountants of Bangladesh, 1980).

230. Milward, G.E., An Approach to Management, (London: Macdonald & Evans, 1946).

231. Mishra, B.L., and Marothia, D.K., "Possibilities of Fertilizer Substitution for Land in Paddy Production", The Bangladesh Development Studies, Vol.III, No.2, (Dhaka: The Bangladesh Institute of Development Studies, 1975).

232. Mohiuddin, Md., "Inventory Management", paper presented in the seminar sponsored by the Institute of Cost and Management Accountants of Bangladesh, Dhaka, December 14&15, 1985.

233. _____, "Why Cost Control and How to Control", paper presented in the 'Cost Control and Cost Reduction' Conference sponsored by the Institute of Cost and Management Accountants of Bangladesh, (Dhaka: 1981).

234. Mohiuddin, Kazi Golam, "Making Management Cost-Conscious", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1975).

235. Momin, Abdul, "CUFP - Another Bold Step", The Bangladesh Observer, (Dhaka: December, 1985).

236. Moniruzzaman, Md., "Accountability of Public Enterprises in Bangladesh", Management Development, (Dhaka: Bangladesh Management Development Centre, 1981).

237. Mondol and Others, "A Survey of Cost Control Methods Used by Industrial Units in the Khulna Region", (Rajshahi University, 1975).

238. Moore, Franklin G., Manufacturing Management, (Ontario: Richard D. Irwin Inc., 1969).

239. _____, Production Control, (New York: McGraw-Hill Book Company, 1959).

240. Mote, U.L., Paul, S., and Gupta, G.S., Managerial Economics: Concepts and Cases, (New Delhi: Tata Mcgraw-Hill Publishing Company Limited, 1978).

241. Mussowir, M.A., Commentary on 'Cost Audit' seminar sponsored by the Institute of Cost and Management Accountants of Bangladesh, (Dhaka: 1985).

242. Muqtada, M., "The Seed-Fertilizer Technology and Surplus Labour in Bangladesh Agriculture", The Bangladesh Development Studies, Vol.3, No.4, (Dhaka: The Bangladesh Institute of Development Studies, 1975).

243. Muqtader, A.N.M. Abdul, "Inventory Planning and Control in Jute Industry in Bangladesh", unpublished Ph.D. Thesis, (Chittagong University, 1987).

244. Nag, Amal Bhushan, "Quantifiability and Objectivity in Accounting", Hishab Bijnan, (Chittagong University, 1980).

245. Narain, Laxmi, Public Enterprise in India, (New Delhi: S. Chand & Co. Ltd., 1975).

246. National Association of Cost Accountants, The Analysis of Manufacturing Cost Variances, Research Series No. 22 (USA, 1952).

247. National Industrial Conference Board, Budgetary Control in Manufacturing Industry, (New York, 1931).

248. Natural Gas Fertilizer Factory Limited, Annual Report (Five Years Upto 1985-86), (Fenchugonj, Sylhet).

249. _____, Annual Audit Report (Five Years Upto 1985-86), (Fenchugonj, Sylhet).

250. _____, Annual Budget (Five Years upto 1985-86), (Fenchugonj, Sylhet).

251. Nelson, R.E. and Goldman, H.J., "Cost Control : How to Make It Work (Using the Best of Zero-Base Budgeting and other Approaches)", The Hand Book of Business Problem Solving, (New York: McGraw-Hill Book Company, 1980).

252. Neuner, John J.W., Cost Accounting : Principles and Practice, (Illinois: Richard D. Irwin, Inc., 1952).

253. Newman, William H., Administrative Action : The Techniques of Organisation and Management, (New Jersey: Prentice-Hall, Inc., 1963).

254. Nickerson, Charence B., Managerial Cost Accounting and Analysis, (New York: McGraw-Hill Book Company, 1962).

255. Nigam, R.S., Narang, S.P., and Sehgoal, B.C., Advanced Cost Accounting, (New Delhi: S. Chand & Co. Ltd., 1981).

256. Noble, Carl E., "Calculating Control Limits for Cost Control Data", NACA Bulletin, (USA: National Association of Cost Accountants, 1954).

257. Noor, M. Sajjad, "Fertilizer Use Extension and Its Management", The Bangladesh Observer, (Dhaka: 5th February, 1986).

258. Onsi, Mohamed, "Quantitative Models for Accounting Control", The Accounting Review, (Quoted in 'Information Analysis in Management Accounting' edited by Anderson, D.L., and Ram, D.L., John Wiley & Sons, New York, 1978).

259. Owler, L.W.J., and Brown, J.L., Wheldon's Cost Accounting, (London: Macdonald & Evans Ltd., 1984).

260. Parker, R.H., Macmillan Dictionary of Accounting, (London: Macmillan Press, 1984).

261. Parkinson, C.N. and Rustomji, M.K., Realities in Management, (Bombay: IBM Publishing Company, 1983).

262. Parry, Michael, and Khan, Ferdous, A Survey of Published Accounts in Bangladesh, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1984).

263. Parvin, P. Shah, Cost Control and Information Systems, (New York: McGraw-Hill Book Company, 1981).

264. Paul, Duane A., Kilmer, Richard, Altobello, Maridyn and Harrington, David N., The Changing U.S. Fertilizer Industry, (Washington, D.C., 1977).

265. Paul, Manoj Kumar, "Audit-Value for Money?" The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parisad, 1985).

266. Paul, Pradip Kumar, "The Changing Profile of the Accounting Functions - A Bird's Eye View", The Accountant, (Dhaka: The Bangladesh Chartered Accountancy Chatra Parisad, 1985).

267. Peirce, James L., "The Budget Comes of Age", The Harvard Business Review, (New York, 1954).

268. Petersen, Elliott, "Setting Cost Reduction Goals", Advanced Management, 1950.

269. Pugsley, John, paper presented in the 32nd Annual International Cost Conference of the National Association of Cost Accountants, The Management Review. (USA: 1951).

270. Quasem, M.A., "Supply and Distribution of Fertilizers in Bangladesh", Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh. (Washington, D.C., 1985).

271. _____, "Factors Affecting the Use of Fertilizer in Bangladesh", The Bangladesh Development Studies, Vol.VI, No.3, (Dhaka: The Bangladesh Institute of Development Studies, 1978).

272. Quasem, M.A. and Khan, S.A., Impact of the New System of Distribution of Fertilizer and Irrigation Machines in Bangladesh, (Dhaka: The Bangladesh Institute of Development Studies, 1984).

273. Rahman, Alimur, "Capacity Utilisation in the Large-Scale Manufacturing Industry in Bangladesh", Ph.D. Thesis (University of Sussex, 1978).

274. Rahman, Mawdudur, "A Notes on Controls and Accounting in Nationalised Corporation in Bangladesh", Management, Business and Economics. (Dhaka: The Institute of Business Administration, 1978).

275. _____, "Budget Behaviour Managerial Approach to Budgetary Control", Management, Business and Economics. (Dhaka: The Institute of Business Administration, 1977).

276. _____, "An Empirical Investigation into Management Use of Accounting Information and the Influence of Selected Jobs Related Traits and Organisational Correlates", unpublished Ph.D. Thesis,(Manchester: Manchester Business School, 1976).

277. Rahman, Mawdudur, and Halladay, Maurice, Accounting Information Systems : Principles, Applications, and Future Directions, (New Jersey: Prentice Hall, 1988).

278. Rahman, M.L., SAARC Facts and Economic Development. (Dhaka: SARC Association, 1986).

279. Rahman, Taibur, "Safety Problems in Fertilizer Industry and their Optimum Solutions", Management Development. (Dhaka: Bangladesh Management Development Centre, 1973).

280. Ramanadham, V.V. (edited), The Efficacy of Public Enterprises. (Bombay: Allied Publishers Private Limited, 1963).

281. Ramu, S. Shiva, "Designing a Research Policy for Public Enterprises", paper presented in the National Seminar of the Institute of Public Enterprises,(Hyderabad, March 1982).

282. Rathe, Alex W., Management Controls in Business, the proceedings of a symposium held at System Development Corporation, Santa Monica, California, July 29-31, 1959.

283. Rayburn, Letrica Gayle, Principles of Cost Accounting : Managerial Applications. (Illinois: Richard D. Irwin Inc., 1983).

284. Richards, Max D., Readings in Management, (New York: South-Western Publishing Co.).

285. Robert T. Spouse and Maurice Moonitz, Accounting Research Study. (New York: American Institute of Certified Public Accountants, 1962).

286. Roscoe, Edwin Scott, and Freak, Dorman G., Organisation for Production, (Homewood: Richard D. Irwin, Inc., 1971).

287. Ryall, Dictionary of Costing, (quoted by B.K. Bhar, Cost Accounting : Methods and Problems, (Calcutta: Academic Publisher, 1972).

288. Salam, Md.Abdus, "Inflation - The Great Problem", The Accountant. (Dhaka: Bangladesh Chartered Accountancy Chatra Parisad, 1980).

289. Samad, M.A., "Focus on : Fertilizer Production and Consumption in Bangladesh", Fertilizer Focus, (London: FMB Publications Ltd., June 1986).

290. Sarker, T.L., Mishra, R.K., and Ravishanker, S., (edited), Public Enterprises in India, (Bombay: Himalaya Publishing House, 1986).

291. Satter, M.A., "Fertilizers : Not too Much, Not too Less", The New Nation, (Dhaka: August 29, 1986).

292. Schiff and Lewin, "The Impact of People and Budgets", The Accounting Review, 1970.

293. Schlatter, C.F., and Schlatter, W.J., Cost Accounting, (New York: 1960).

294. Sen, Dilip Kumar, "Depreciation Accounting : Is it a Problem for Research in a Developing Country like Bangladesh?" The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parisad, 1986).

295. Shaha, Abhinaya Chandra, "An Analytical View of Liquidity and Profitability of Rajshahi Silk Factory", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1984).

296. _____, "Working Capital Management in the Jute Mills of Dhaka Zone, Bangladesh", The Rajshahi University Studies, Vol.XI, No.1, (Rajshahi, 1978).

297. _____, "A Study of Some Problems of Working Capital Management in the Jute Mills of Dhaka Zone", unpublished Ph.D. Thesis, (Baroda: M.S. University).

298. Shaha, Saroj Kumar, "Accounting System in Planned Economy", The Dhaka University Studies, Part-C, (Dhaka, 1987).

299. Shahidullah, Md., "Methods of Cost Control and Cost Reduction in the Nationalised Industrial Sector", The Accountant, (Dhaka: Bangladesh Chartered Accountancy Chatra Parishad, 1975).

300. Sherlekar, S.A., Industrial Organisation and Management, (Bombay: Himalaya Publishing House, 1979).

301. Shillinglaw, Gordon, Cost Accounting : Analysis and Control, (Illinois: Richard D. Irwin, Inc., 1961).

302. Siddique, Abu Hossain, "Compression of Salary Structures of Higher Level Executives in Bangladesh", The Dhaka University Studies, Part-C, (Dhaka, 1985).

303. Smiddy, Harold F., Managers and Cost Control, SAM, 1949.

304. Sobhan, Rehman, and Ahmed, Muzaffer, Public Enterprise in an Intermediate Regime : A Study in the Political Economy of Bangladesh, (Dhaka: The Bangladesh Institute of Development Studies, 1980).

305. Srinivasan, A.V., Critical Path Analysis : A System Approach, (New Delhi: Affiliated East-West Press Ltd., 1976).

306. Stedry, A.C., Budget Control and Cost Behavior, (New Jersey: Prentice-Hall Inc., 1960).

307. Steinmetz, Lawrence L., and Todd, H. Ralph, First-Line Management : Approaching Supervision Effectively, (Texas: Business Publications, Inc., 1979).

308. Talukder, Md. Yusuf, "Inflation Accounting for Management Planning and Control", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1982).

309. _____, "Why do we Need Inflation Accounting", The Bangladesh Accountant, (Dhaka: The Institute of Chartered Accountants of Bangladesh, 1980).

310. Tandon, B.C., Management of Public Enterprises, (Allahabad: Chaitanya Publishing House, 1978).

311. Tandon, B.N., Practical Auditing, (New Delhi: S. Chand & Company Ltd., 1985).

312. Tandon, P., "Control Systems and Accountability in the Public Enterprise", Control Systems for Public Enterprises in Developing Countries, (Ljubljana: International Center for Public Enterprises in Developing Countries, 1982).

313. Terry, George R., A Guide to Management, (Illinois: Richard D. Irwin, Inc., 1981).

314. _____, Principles of Management, (Ontario: Richard D. Irwin, Inc., 1977).

315. The Bangladesh Observer, "Cost and Competition" (Dhaka: Editorial, January 27, 1987).

316. _____, "Stake in Agriculture", (Dhaka: Editorial, January 7, 1987).

317. _____, "Maintenance Management", (Dhaka: Editorial, December 3, 1986).

318. _____, "Need and Supply of Food", (Dhaka: Editorial, November 6, 1986).

319. _____, "Time, Cost and Justice", (Dhaka: Editorial, February 28, 1986).

320. _____, "Instrument of Control", (Dhaka: Editorial, December 22, 1985).

321. _____, "Cost of Production", (Dhaka: Editorial, November, 1985).

322. _____, "Fertilizer for Winter Farming", (Dhaka: Editorial, October 22, 1985).

323. _____, "Fertilizer Plants in Private Sector Proposed", (Dhaka: September 11, 1985).

324. The Daily Inqilab, (Dhaka: 11th June, 1988).

325. The Encyclopedia Americana, Vol.II, (USA: Grolier Incorporated International Head Quarters, 1983).

326. The New Nation, "Fertilizer and Incentive Prices", (Dhaka: Editorial, 28th April, 1986).

327. Thomas, Philip S., Personnel Policies in Public Enterprises, (Ahmedabad, Government of India, 1979).

328. Thomas, S. Dudick, Cost Control for Industries, (New Jersey: Prentice-Hall Inc., 1962).

329. Triple Superphosphate Complex Limited, Annual Report, (Five Years upto 1985-86), (North Potenga, Chittagong).

330. _____, Annual Audit Report (Five Years upto 1985-86), (North Potenga, Chittagong).

331. _____, Annual Budget, (Five Years upto 1985-86), (North Potenga, Chittagong).

332. United Nations, Fertilizer Manual, (New York: 1980).

333. United Nations Industrial Development Organisation, Recent Developments in the Fertilizer Industry, (New York: 1972).

334. _____, Fertilizer Industry, (New York, 1969).

335. Urea Fertilizer Factory Limited, Annual Report (Five Years upto 1985-86), (Narsingdhi, Ghorasal).

336. _____, Annual Audit Report, (Five Years upto 1985-86), (Narsingdhi, Ghorasal).

337. _____, Annual Budget, (Five Years upto 1985-86), (Narsingdhi, Ghorasal).

338. Voitsberger, D.M., "Standard Costs and Cost Standards", Modern Management, 1945.

339. Vries, Barend A. de, "High Cost of Industry in Developing Countries - Causes and Remedies", Modern Management, (Chittagong: East Pakistan Management Association, 1970).

340. Vroom, Victor H., "Motivation in Management", American Foundation for Management Research.

341. Walsh Jr., Internal Auditing, Business Policy Study No.III, (USA: National Industrial Conference Board Inc., 1963).

342. Woolf, Emile, Auditing Today, (Englewood Cliffs: Prentice Hall International, 1982).

343. World Bank, The World Bank Annual Report 1986, (Washington, D.C., 1986).

344. _____, A Survey of the Fertilizer Sector in India, (Washington, D.C., 1979).

345. _____, A Programming Approach to Fertilizer Sector Planning, (Washington, D.C., 1978).

346. _____, Bangladesh : Food Policy Review, (Washington, D.C., 1977).

347. _____, A Planning Study of the Fertilizer Sector in Egypt, (Washington, D.C., 1977).

348. Wright, M.G., The Director's Guide to Accounting and Finance, (London: McGraw-Hill Book Co., 1976).

349. Yorston, Smyth, and Brown, Advanced Accounting, (Quoted by Bhabatosh Benerjee, "Cost Accounting", The World Press Private Ltd., Calcutta, 1981).

350. Zia Fertilizer Company Limited, Annual Report, (Three Years Upto 1985-86) (Ashugonj, Brahmanbaria).

351. _____, Annual Audit Report (Three Years upto 1985-86), (Ashugonj, Brahmanbaria).

352. _____, Annual Budget (Three Years upto 1985-86), (Ashugonj, Brahmanbaria).