

RARE BOOK

A METHOD FOR DESIGNING AN INCENTIVE
SYSTEM FOR THE JUTE INDUSTRY OF
BANGLADESH IN PARTICULAR AND FOR THE
NATIONALIZED INDUSTRIES IN GENERAL.

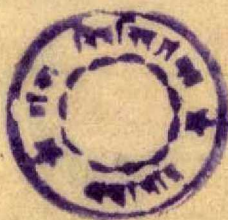
MAIN WORK
AND
DISSERTATION PROPER

A. MOMIN CHOWDHURY

Dhaka University Library



A209366



RB
658.314
MOM

ACKNOWLEDGEMENT.

I gratefully acknowledge with thanks, my indebtedness to Mr. M. Serajul Islam, Director, BMDC, for kindly permitting me to pursue this study, to Dr. V.G.E. Powell, Dr. I.A.H. Ascar (UNIDO expert for BJMC, Dacca), Dr. M. Habibullah, Professor V.L. Thomas of the Manchester University, Dr. M. F. Zaman and Dr. Hamida Akhtar Begum, Deptt. of Psychology of the University of Dacca and Dr. B. Hoda of the Rajshahi University for their kind and generous suggestions, criticisms and guidance whenever I wanted it from them, at all phases of the study. To Prof. B. Winid of the University of Warsaw (Poland), I owe much for his suggestions on the applications of the statistical methods in this study.

My special gratitude goes to Dr. A.G. Lank, C.E.I., University of Geneva and Dr. Jeremiah J. O'Connell, C.E.I., University of Geneva, Professors of Organisational Development and Organisational Behavior, for their valued criticism and guidance while designing the first, 7-rank, AIP Survey Questionnaire.

My sincere thanks to Mrs. Sabiha Khatoon for her valuable co-operation, during the survey.

I cannot forget to extend my thanks to Mr. A. Wahab Khan, Mr. Shamsul Hoque, Mr. Md. Sanaullah and Mr. Sakhawat Ali for their help in getting the materials typed and for other typographical works.

This vast amount of work could not be handled within such a short time, if my wife, Nargis would not often go sleepless - just to keep me tight on my table, if necessary, with several cups of tea every night. How can I forget my gratitude to her !

ঢাকা বিশ্ববিদ্যালয় প্রকাশিত

অনুবোধন সূচী

X 209366

A. Momin Chowdhury.

TABLE OF CONTENTS.

<u>CONTENTS</u>	<u>PAGES</u>
ABSTRACT ...	I - IV
INTRODUCTION TO THE STUDY ...	1 - 5
<u>MAIN WORK AND DISSERTATION PROPER</u>	
<u>CHAPTER - 1 : Problem searching and Identification of the problem area.,</u>	6 - 17
1.1. Strength and weakness of the Jute Industry of Bangladesh.	6
1.2. The present organisational environment of the Jute Industry of Bangladesh.	10
1.3. The Efficacy of the Present Incentive System.	15
1.4. Chapter Summary.	16
<u>CHAPTER - 2: Review of Previous works and literature.</u>	
2.1. Some previous works on various aspects of the Industry.	18
2.2. Current Methods of measuring absolute and relative productivity.	21
2.3. Some noted theories on motivation and productivity.	23
2.4. Chapter Summary.	29
<u>CHAPTER - 3: Problem definition, hypotheses, methodology and general discussion.</u>	
3.1. The Rationale of the choice of study.	31
3.2. Problem definition and objective of the study.	32
3.3. The Hypotheses.	33
3.4. The methodology and General Discussion.	36
3.5. Limitations of the Study.	51

<u>CHAPTER - 4 :</u>	COLLECTION AND ANALYSIS OF DATA	56
	Selection and Rejection of Measures.	59
<u>CHAPTER - 5 :</u>	RESULTS OF ANALYSIS	
5.1.	Construction of Production Preference Schedule of Incentives and Benefit Preference Schedule of Incentives.	67
5.2.	Construction of Severity of Incongruence Table.	70
5.3.	Results of comparison of predicted data with historical ones.	75
<u>CHAPTER - 6:</u>	<u>SUMMARY AND CONCLUSION</u>	
	THESES, THEORY AND SUB-HYPOTHESES RESULTING FROM THE STUDY.	
6. 1.	Introduction.	76
6. 2.	Hypotheses for the present Study.	78
6. 3.	A General Theory on Incentives, Productivity Labour problems and Labour Management Relations.	80
6. 4.	Theses resulting from the present study.	81
-	- For the design of an incentive system for the jute industries of Bangladesh.	
-	- For Locating the areas of labour problems with the nature and severity of those prob- lems.	83
6. 5.	Sub-hypotheses resulting from the study, for future researches in the line.	84
6. 6.	Methodology, discussion and conclusion.	86

A P P E N D I XCALCULATIONS AND TABLES.

	<u>Pages</u>
<u>APPENDIX - A</u> :	
1. Tables and calculations relating to Chapter one.	93 - 115
2. Tabulation of test data; Test of content validity, the reliability, the predictive efficiency of the scale and the randomness of the sampling; Determination of the sample size and the sampling plan.	116 - 128
3. Variance Analysis for the mean attitudinal scores made by subjects in each and all the sub-samples.	129 -142
4. Selection of items/measures by using a Selector M with critical values applicable to Hartley's maximum F-Ratio....	129 -142
5. Conversion of the mean attitudinal scores into their centile values and derivation of the Mean Centile Scale for the mean attitudinal scores.	143
6. Determination of the weighted average predictive efficiency of the scale.....	145
7. Conversion of the mean attitudinal scores into their corresponding percentage changes in production.	146
8. Checking the validity of the method of conversion of the attitudinal scores into percentage change in production: Comparison between predicted data and historical data: Counter-checking by another method.....	147 160-168
9. Cost Benefit Analysis for measures selected	148 - 159
10. Derivations and calculations for framing the sub-hypotheses.	169 - 184
<u>APPENDIX - B</u> :	
List of references and Bibliography,....	185 - 189
<u>APPENDIX - C</u> :	
The AIP Survey Questionnaires(7-rank and 8-rank).	190 - 201
<u>APPENDIX - D</u> :	
Bio-data of the present research-worker....	202 - 211

TABLE OF CONTENTS(contd.)

APPENDIX - A

CALCULATIONS AND TABLES.

1. Tables and calculations relating to Chapter one.....	93 - 115
2. Tabulation of test data; Test of content validity, the predictive efficiency of the scale and the randomness of the sampling; Determination of the sample size and the sampling plan.	116 - 128
3. Variance Analysis for the mean attitudinal scores made by subjects in each and all the sub-samples.....	129 - 142
4. Selection of items/measures by using a Selector M with critical values applicable to Hartley's maximum F-Ratio.	129 - 142
5. Conversion of the mean attitudinal scores into their centile values and derivation of the Mean Centile Scale for the mean attitudinal scores	143 -144
6. Determination of the weighted average predictive efficiency of the scale	145
7. Conversion of the mean attitudinal scores into their corresponding percentage changes in production.....	146
8. Checking the validity of the method of conversion of the attitudinal scores into percentage change in production: Comparison between predicted data and historical data: Counter-checking by another method	147 160 - 168
9. Cost Benefit Analysis for measures selected.....	148 - 159
10. Derivations and calculations for framing the sub-hypotheses...	169 - 184

APPENDIX - B

List of References and bibliography	185 - 189
--	-----------

APPENDIX C

The AIP Survey Questionnaires(7-rank and 8-rank).....	190 - 201
---	-----------

APPENDIX - D

Bio-data of the present research-worker	102 -211.
--	-----------

A METHOD
FOR DESIGNING AN INCENTIVE SYSTEM FOR THE JUTE INDUSTRIES
OF BANGLADESH IN PARTICULAR AND THE NATIONALIZED INDUS-
TRIES IN GENERAL.

A B S T R A C T

The study presents a methodology for designing an effective and dynamic incentive system for the nationalized industries of Bangladesh, particularly for the jute industries ----leaving the organisational environment, as it is, and without trying to keep it within any defined conditions. The results obtained are relative, in the sense that the prediction is valid for the conditions of the environment, prevailing during the study period, specially, during the survey period, viz., 1978 - 80. For any other period of time and environmental conditions, the same methodology may be applied to get the Preference Schedule of Incentives, in order of ranks, either of the predicted increase in production or of the predicted net annual benefit, to be derived from the application of the selected incentives. For developing this methodology, a 7-rank survey questionnaire with 30 questions has been used for the test-run and an 8-rank questionnaire, a mild modification of the earlier, and with 33 questions has been used for the final survey. Final sampling has been done with 10 subsamples, with each around 20 subjects, and covering the managers, supervisors and workers ---- in general and region-wise. Total attitudinal score by all the subjects in each sub-sample, for the whole battery of the 33 incentives were added and then was divided by 33 and by the number of subjects in the sub-sample, and thus, the over-all mean attitudinal score was found out. The standard deviation of this mean for the test sample has been used to calculate the required sample size. The total of the scores for each item by all subjects in each subsample have been divided by the number of subjects in the subsample, to get the item mean score, of the subsample. The ratio of the variances of the overall mean score and of the items mean score gave the F_{i-o} , the ratio of variances of the means for each item in each subsample. The maximum ratio of these F_{i-o} 's for each item, in all the sub-samples, compared with the corresponding value of Hartley's F-maximum ratio gives the

selection or rejection of the item or the measure in question as an incentive under the prevalent environmental conditions. The item mean score, converted into its centile values and then multiplied by the Weighted Average Predictive Efficiency of the AIP Scale used, gives the net predicted change in production.

The predictive efficiency of the AIP scale used for the study was determined via the coefficient of correlation of the two halves of responses made by the subjects in each subsample, determined by using the Split-half technique (pp 144). Historical data for same, similar or equivalent measures obtained from available sources for the same period and under the same environmental conditions were compared by measuring the percentage difference between the total changes in production of the two series and by rank difference method (pp 75). The reliability of measuring the % net change in production, from the predicted gross % change in production by using the weighted average predictive efficiency of the scale, has been tested by comparing the results of the % net change obtained by multiplying the % gross change by the co-efficient of attribute and the contingency co-efficient; here also, the % difference of the totals and their correlation by rank difference method have been calculated (pp 147). The analysis of data resulted in the preparation of a Preference Schedule of Incentives in order of ranks, towards which all levels of connected peoples, i. e. managers, supervisors and workers, showed their indifference (and hence selected unanimously), under the environmental conditions, prevalent during the study period (1978 - 1980).

Net Annual Benefit analysis has then been carried out for the measures of the Production Preference Schedule of Incentives and this yielded the final, Benefit Preference Schedule of Incentives, which is a more logical one for implementation purpose. The measures thus suggested, with a Coefficient of Variation of $\pm 5\%$ of the net change predicted, are as follows :

Under the present organisational environment of the industry,

- 1) Management and technical training for all Management staff of the jute industry would increase its total production by 17% and the Net Annual Benefit accruing therefrom will be in the tune of Taka 19.85 crores or more (pp 151 and 152).
- 2) Giving impartial, judicious promotions upto the post of general manager, would increase production by 80,000 tons/yr., yielding a NAB* of Tk. 18.5 crores or more (pp 154).
- 3) Ensuring that every superior leaves and gives clear job instruction for all subordinates would increase production by 75,000 tons/yr., yielding a NAB of Tk. 16.93 crores or more (pp 151).
- 4) By making all working places of workers cleaner and cooler, production would increase by 57,500 tons/yr., yielding a NAB of Tk. 16.08 crores or more (pp 158).
- 5) By ensuring good behavior from all superiors to all subordinates, production would increase by 62,500 tons/yr., yielding a NAB of Tk. 13.28 crores or more (pp 152).
- 6) By installing preventive maintenance system in all the jute mills, production would increase by 90,000 tons/yr. yielding a NAB of Tk. 11.56 crores or more (pp 153).
- 7) By allowing the departmental heads to set their production targets, production would increase by 52,500 tons/yr. yielding a NAB of Tk. 10.25 crores or more (pp 154).
- 8) By replacing the old and deteriorated machineries of all mills production would increase by 82,500 tons/yr., yielding a NAB of Tk. 6.00 crores or more (pp 148).

Results of the study also indicate that the industry could afford to spend Tk. 20.00 crores per year on housing of workers, and can offer

* NAB stands for Net Annual Benefit.

IV

a cost-of-living allowance of Tk. 23,40 crores/yr. to all working in the industry (pp 155).

The study thus offers a method which may be applied from time to time, to any industry in general, and the jute industry in particular, in any prevalent environment, to design a dynamic incentive system and to predict the possible outcome or yield of that incentive system, to be installed for increasing the productivity of the said industry or for affording any socio-political justice or welfare measure.

The study finally offers us a general theory on incentives, productivity, labour-management relations and labour problems in the nationalized industries of Bangladesh, which may equally be applicable to the industrial sector in general.

The study also indicates the possible determinants of attitudes of managers, supervisors and workers toward incentives and productivity, and thence offers, a possible method for determining the maximum and minimum effective salary/wage to be offered under any prevalent organisational environment of the industry. It indicates the necessity as well as the means of adjusting any existing Salary-Wage-Incentive Structure to the optimum benefit of the industry and its people, at any point of time.

A METHOD
FOR DESIGNING AN INCENTIVE SYSTEM FOR THE JUTE INDUSTRY
OF BANGLADESH IN PARTICULAR AND THE NATIONALIZED INDUS-
TRIES IN GENERAL

INTRODUCTION TO THE STUDY

In introducing the study to its reader, a word of caution is necessary. The field of this study, namely, behavioral accounting and more specifically, quantification of attitudes, is, to the experience of the present worker, a quite disputed and explosive. Many in the field seem to hold a pessimistic view about the possibility of any successful exploration in it. But despite many doubts and an eye of suspicion in its success, the present study, is an outcome of a sincere effort in this particular direction — directing its applicability for the design of a flexible incentive system for the jute industry of Bangladesh in particular, and for the nationalized industries in general, with particular attention on the predictability of the change in the overall productivity of the industry.

The objective of the present study was to develop a method for designing an incentive system; the results obtained are relative and not at all absolute. Hence, which of the measures has been unanimously suggested by the various levels of people in the industry, is of much less concern, than the method of arriving at that selection. Moreover, comparison of the predicted result, with the available historical measures (page 75) leaves little doubt on the reliability of the method of that selection of those measures.

There is no such item in the survey questionnaire used for the study, that is irrelevant, if we do not keep the meaning of an incentive, limited to monetary or positive incentives only. All the 33 items of the 8-rank AIP survey questionnaire used in the present study, are very relevant to the industry and are much talked of, within and outside it. The management of the industry may like some incentive measure very much, but that may not be so liked by the workers who are the direct beneficiaries of any incentive system installed.

It was therefore thought unreasonable and inappropriate to think of designing the Survey Questionnaire according to the liking of the management only, and to keep the workers of the industry excluded from the study.

The methodology used has been a sample survey of attitudes of workers, supervisors and managers of the jute industry. The sampling work has been based on Exact Sampling Theory and the tools used were statistical — the principal one being the Analysis of Variance.

The analysis of data has been carried out on the basis of Exact Sampling Theory or Small Sampling Theory, with Student's *t* distribution and the Chi-Square distribution of the statistics.

The reasons for choosing the application of the Exact Sampling Theory for the analysis of data of this study are the following :

(i) The population is over 200,000 and even if, 1% of this population is to be sampled on the basis of the techniques of Large Sampling Theory, it would easily take away 5-6 years for data collection only, which is an impossible proposition.

(ii) Exact Sampling Theory coupled with the Analysis of Variance techniques is much more sophisticated and easier to handle such an almost-infinite population, to yield reasonably acceptable data within a reasonable time.

(iii) The randomness of sampling can be tested by the application of the χ^2 -test⁽⁴⁸⁾. This has been the only way to test the randomness of the near-replicated samples (of size around 20) used in the present study.

(iv) Scheduling a survey questionnaire with 33 measures, ⁽³⁵⁾, ⁽⁵²⁾ to a worker requires 2-3 hours. Hence it is practically impossible to record the attitude of workers for all these 33 measures, if the sample size is not kept small.

(48) Leabo, Dic A, "Basic Statistics"(pp 524) Richard D.Irwin Inc., 1972.

(v) Working with the Exact Sampling Theory does not necessitate the maintenance of a definite proportion between the actual population and the sample size chosen, and the results obtained ~~it holds~~ for large as well as small samples. The sample size for the worker strata has been determined on the basis of the calculated (required) sample size for supervisors (page 127) on the principle of $\frac{n_1}{\sigma_1} = \frac{n_2}{\sigma_2}$ as suggested by Moser (35), (52), whereby the required sample size for the workers were around 20, if the standard deviation of the sub-sample's mean score was very close to that of the test sample.

In the present study, the total number of workers sampled was 42, and the number of subsamples are 2. That is, the worker-strata has been sampled by 2 replicated subsamples — each of size 21.

The actual sample sizes and the standard deviations of their means (details tabulated on page 43) were as follows :

Test Sample(Supervisors)	Workers Sample 1	Workers Sample 2
1. Sample size 18	21	21
Standard Devia- tion of the mean score.		
2. Standard Devia- 0.59 tion of the mean score.	0.42	0.61
3. Mean Score. 3.87	4.34	4.21

(vi) Test - Retest*.

This was performed with the same group of managers (Sub-Sample S₃/NI) at an interval of 1 month. Test for the significance of difference between the mean score of the two sets has been used as the criteria. Results obtained was from the application of the formula mentioned on the next page.

(52) Moser, C.A.; "Survey Methods in Social Investigation" Heinemann, London, 1968.

(35) Goods, William J. and Hatt Paul K. "Methods in Social Research" McGrawHill, 1952.

*The group was in a training programme at the BMDC, for 3 months.

CHAPTER - I.

:PROBLEM SEARCHING AND IDENTIFICATION
OF THE PROBLEM AREA.

(pages 6 ~ 16)

- 1.1. Strength and weakness of the jute industry of Bangladesh.
- 1.2. The present organisational environment of the Jute Industry of Bangladesh.
- 1.3. The Efficacy of the Present Incentive System.
- 1.4. Chapter Summary.

(v) Working with the Exact Sampling Theory does not necessitate the maintenance of a definite proportion between the actual population and the sample size chosen, and the results obtained hold for large as well as small samples. The sample size for the worker strata has been determined on the basis of the calculated (required) sample size for supervisors (page 127) on the principle of $\frac{n_1}{\sigma_1} = \frac{n_2}{\sigma_2}$ as suggested by Moser (35), (52), whereby the required sample size for the workers were around 20, if the standard deviation of the sub-sample's mean score was very close to that of the test sample.

In the present study, the total number of workers sampled was 42, and the number of subsamples are 2. That is, the worker-strata has been sampled by 2 replicated subsamples — each of size 21.

The actual sample sizes and the standard deviations of their means (details tabulated on page 43) were as follows :

Test Sample(Supervisors)	Workers Sample 1	Workers Sample 2
1. Sample size 18	21	21
Standard Devia- tion of the mean score.		
2. Standard Devia- 0.59 tion of the mean score.	0.42	0.61
3. Mean Score. 3.87	4.34	4.21

(vi) Test - Retest*.

This was performed with the same group of managers (Sub-Sample S₃/NI) at an interval of 1 month. Test for the significance of difference between the mean score of the two sets has been used as the criteria. Results obtained was from the application of the formula mentioned on the next page.

(52) Moser, C.A.; "Survey Methods in Social Investigation" Heinemann, London, 1968.

(35) Goods, William J. and Hatt Paul K. "Methods in Social Research" McGrawHill, 1952.

*The group was in a training programme at the BMDC, for 3 months.

$$t = \frac{X_1 - X_2}{\sigma(x_1 - x_2) \sqrt{\frac{1}{N_2} + \frac{1}{N_1}}} \quad \text{where}$$

$$\sigma(x_1 - x_2) = \sqrt{\frac{N_1 s_1^2 + N_2 s_2^2}{N_1 + N_2 - 2}} \quad \text{and the criteria,} \quad (64)$$

t (calculated) is less than t (critical) for the same number of degrees of freedom and the same confidence level, has been used to test the following :

- 1) Reliability of the scale used
- 2) Insignificance of difference between the two questionnaires (i.e. the 7-rank test questionnaire and the 8-rank final questionnaire) used in the study.

(vii) The minimum sample size, with a minimum of leptokartik sampling distribution, theoretically required to work with any population, by applying the Exact Sampling Theory, is $10^{(55)}$, the sampling distribution tending to be normal as the sample size increases to 30.

The principal contribution made by the study is the devising of a method of synchronizing of attitudes of various levels or echelons of people in the industry ——— those for whom any incentive system is primarily meant. For doing this, a selector (termed as M) has been defined, developed and used for the final selection of incentives under any prevalent organisational environment of the industry. The noblest part of the whole contribution of this study is the evolution of a method of adjusting any incentive system, with the dynamic nature of the environment of the industry. The efficiency of the developed selector has been tested by comparing the predicted results with those from same, similar or equivalent measures obtained historically.

The study, quite expectedly, suffers from some shortcomings, notably, its confidence level ($\alpha = 0.05$), its margin of error ($\pm 5\%$), the assumptions made in making the sampling (discussed fully in

(55) Peatman, John D, "Introduction to Applied Statistics" (pp - 209, 284) Harper and Row, New York.

(64) Spigel, Murray R., "Theory and Problems of Statistics" McGraw-Hill, N.Y., 1972.

Chapter 4, under Methodology, Discussion and Limitation of the study), in making the cost-benefit analysis of possible effects of the selected measures, and in testing the reliability of the predictions obtained from the study(page 38)

However, inspite of all its limitations and short-comings, it is believed that the study offers us an extremely useful method of behavioral accounting or more specifically, the quantification of attitudes towards anything. It gives us a general theory of motivation, productivity, labour problems and labour-management relations. Moreover, it indicates the possible determinants of attitudes towards incentive and productivity, which, nevertheless, requires further study.

Of course, extreme caution will have to be taken while making use of this method for designing an incentive system for the jute industries of Bangladesh or for its nationalized industries in general.

CHAPTER - I.

:PROBLEM SEARCHING AND IDENTIFICATION
OF THE PROBLEM AREA.

(pages 6 ~ 16)

- 1.1. Strength and weakness of the jute industry of Bangladesh.
- 1.2. The present organisational environment of the Jute Industry of Bangladesh.
- 1.3. The Efficacy of the Present Incentive System.
- 1.4. Chapter Summary.

(6)

THE JUTE INDUSTRY OF BANGLADESH:
ITS STRENGTH AND WEAKNESS

While searching the problem and identifying the problem area, the jute industry of Bangladesh has been considered first, because, the Jute Industry of Bangladesh, through exports of its products, earns 40% - 60% of the total foreign exchange earnings of the country (page 10, column 6 Table - 1). Employing over 2.00 lakhs of people, it still makes the backbone of the economy. Debt servicing, buying foodgrains with cash foreign exchanges and a large share of country's imports are all cushioned off from sales proceeds from export of jute products. The health of the economy hinges much on how well the jute industry operates. The country scarcely has other opportunities than to invigorate the hard-pressed jute industry. A 1.0% change in the Labour Productivity may wellbring a net change of about 18% in the total production, whereas, an increase of about 50% in the total production may be required to save the industry from suffering any loss (please see page 110).

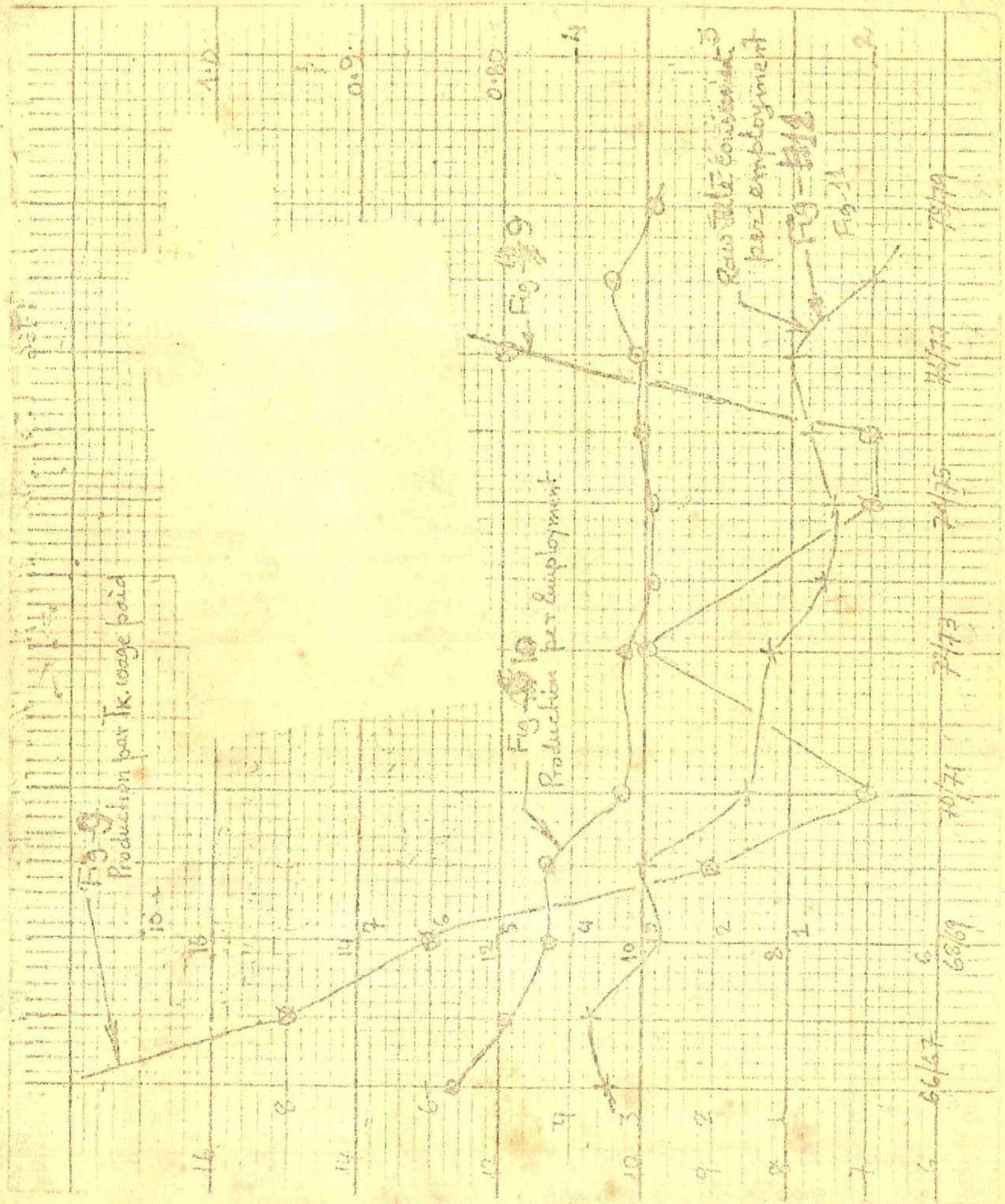
But alas! almost since inception the industry has been incurring chronic losses which is only increasing day by day. Table 1 (pp 106 - 113) depicts the history of the industry from 1964 through 1979-1980 covering all the important aspects of the industry. Column 1 shows total foreign exchange earnings in millions of dollars, column (2) - total foreign exchange earned by jute, at current price/at constant price, etc. and the headings are self-explanatory.

A close view of the table will reveal the following important facts, more relevant to the present study (pp 93 - 100):

- (1) The industry has always been incurring losses (column 24 & 25a). Bonus Vouchers, Cash subsidy and subsidy have always been given to cover some portion of the total loss, to some extent. Columns 26 through 30 reveal this very

clearly. Such measures could not save the industry from its heavy loss.

- (2) Jute goods production shows rather no upward trend (column 7 & 8⁽¹⁾) whereas, total employment maintained an increasing trend.
- (3) Production per Taka wage given gradually decreased from 7.31 lbs per Taka per year in 1966-1967 to 1.35 lbs per Tk. per year (column⁽¹⁾ 23).
- (4) Labour cost gradually increased, but the Labour Productivity decreased (columns 10 & 21⁽¹⁾).
- (5) Employment gradually increased, whereas, Labour Productivity gradually decreased (columns 8 & 21)⁽¹⁾.
- (6) Raw jute consumption per employed, gradually decreased over the years (columns 8 & 9 of Table -1) confirming decrease in labour-productivity.
- (7) Production per loom per year has varied from 34.66 (1965-66 to 22.21 (1978-1979). This is no proof of the decrease in looms productivity because, the industry produced 24.26 tons in (1970-1971) and 25.61 tons per loom per yr. in 1977-78 (Table -1, column -18; Table⁽¹⁾ -12).
- (8) Incentive Bonus Scheme For Jute Industry installed by the BJMC (Ref. No. BJMC/AC/56.35) in 1976 did not work to any significant extent as is evident from column 23 of Table-1 (pp 106-112); production per Tk. of wage + incentives paid deteriorated from 1.50 in 1976 - 77 to 1.35 in 1978-79. Another study, "Payment by Results"⁽²¹⁾ recently concluded by the Bangladesh Management Development Centre, also drew the same conclusion.
- (21) Bangladesh Management Development Centre, Dacca, "To study the System of Payment by Results In The Industrial Sector of Bangladesh and Some Asian Countries", Jan. 1981.
- (1) Refers to Table - 1 (pp 93 - 100)



e) Capital Structure: At present, practically the entire amount of the working capital is being financed from bank loan, with gradual increase in current liabilities. (Please see page -105).

f) Production/Quality Control:

The maintenance of a constant yardage value of, say, 3600 yds/ton for Hessian, indicates sheer absence of any rigorous production/quality control practice (Please see page 106 and 107).

g) Management Information System: 17,47. The management information system, if any, seems to be defective, as is shown by the discrepancy between the % conversion and % wastage figures from 1968-69 to 1977-78 (Please see page 108).

h) Management Philosophy/Organisational Behavior:

The authority - responsibility relationship does not seem to have been clearly defined. Accountability does seem to be limited to transfer only; Illegal recruitments⁽²⁹⁾ and transfer of managers⁽²⁹⁾ resulting in increased production etc. suggests such a conclusion. Maximum change in production due to such transfers etc. may come to about 56%⁽²⁹⁾ (Please see page 113).

i) Electrical Failures - an uncontrollable environmental factor: Frequent power failures cause losses to the tune of millions of Taka to the industry⁽⁶⁸⁾. Taka 950 millions worth production had been lost in the year 1979-80, only due to electrical failures and labour unrest⁽²⁹⁾. In 1978-79, loss in production due to electrical failures was about 7%⁽³⁰⁾ (Please see page 114).

(29) The Daily Ittefaq, "Transfer and Suspension of Managers in the Adamjee Jute Mills", Sept.13,1979.

(10)

THE PRESENT ORGANISATIONAL ENVIRONMENT
OF THE JUTE INDUSTRY: AN ANALYSIS

a) The Span of Control:

At present, there is no uniformity in the distribution of span of control of officers of various mills; it varies from 23-69 (Please see page 102).

b) The Organisation Structure:

The Organisation Structures of different mills vary widely. Head sardars are usually extremely imbalanced; in one of the sample structures studied, there are 50 Head Sardars and 100 Sardars under 12 Shift Incharges and 110 Supervisors, whereas, in the other sample structure studied, there were 6 Head Sardars under 12 Shop Floor Supervisors (Page-14)

c) Salary/Wage/Incentives Proportion:

1976-77 Figures⁽⁴⁷⁾ show that (Please see page 103) Total Employment by BJMC = 1,98,705 persons; Officers + employees in Head Office, Zonal offices and Directorates 914 persons.

Employment Ratio between Officers + employees and the workers is 0.45 whereas, the salary/wage (with fringe) ratio was 1.46. Average salary for Head Office (BJMC), Zonal Offices and Directorates come to be about 11,488 Tk./man/yr. For the Jute Industry as a whole this comes to be 3,611 Tk./man/year.

d) Employment Index⁽⁴⁷⁾: For workers, this increased from 100 in 1969-70 to 158.10 whereas, for all employees, the corresponding values were found to be increasing from 100 to 177.9, during the same period. (Please see page 104).

(47) Khan, Md. Moinuddin et al "A Study on Jute and Cotton Textiles", Jan. 1979, Ministry of Planning, Govt. of Bangladesh.

e) Capital Structure: At present, practically the entire amount of the working capital is being financed from bank loan, with gradual increase in current liabilities. (Please see page -105).

f) Production/Quality Control:

The maintenance of a constant yardage value of, say, 3600 yds/ton for Hessian, indicates sheer absence of any rigorous production/quality control practice (Please see page 106 and 107).

g) Management Information System: ^{17,47}. The management information system, if any, seems to be defective, as is shown by the discrepancy between the % conversion and % wastage figures from 1968-69 to 1977-78 (Please see page 108).

h) Management Philosophy/Organisational Behavior:

The authority - responsibility relationship does not seem to have been clearly defined. Accountability does seem to be limited to transfer only; Illegal recruitments ⁽²⁹⁾ and transfer of managers ⁽²⁹⁾ resulting in increased production etc. suggests such a conclusion. Maximum change in production due to such transfers etc. may come to about 56% ⁽²⁹⁾ (Please see page 113).

i) Electrical Failures - an uncontrollable environmental factor: Frequent power failures cause losses to the tune of millions of Taka to the industry ⁽⁶⁸⁾. Taka 950 millions worth production had been lost in the year 1979-80, only due to electrical failures and labour unrest ⁽²⁹⁾. In 1978-79, loss in production due to electrical failures was about 7% ⁽³⁰⁾ (Please see page 114).

(29) The Daily Ittefaq, "Transfer and Suspension of Managers in the Adamjee Jute Mills", Sept.13,1979.

(72)

J) Labour Policy and Labour Unrest.

Governments Labour Policy allows strikes and lock-outs⁽³¹⁾. Labour unrests or strikes caused a loss of production to the tune of about 5% of the industry's annual production (please see page 114), in 1978-79.

- k) Absenteeism. The March, 1979 figures⁽¹⁵⁾ from the BJMC show that 38% of 1,43,031 workers remain absent during the year. Loss in production due to the engagement of Padli workers come to be 5.6% (Please see pages 111 & 112).

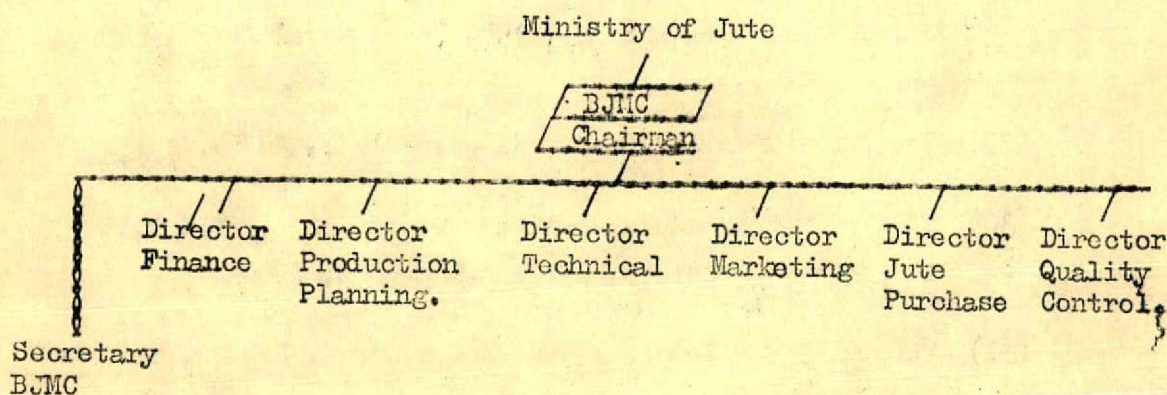
-
- (15) Bangladesh Jute Mills Corporation, "Production Efficiency For The Month of March, 1979", Statistical Deptt, BJMC, Dacca.
- (29) The Daily Ittefaq, Dacca, dated, July 7, 1979.
- (30) The Daily Bangladesh Observer, Dacca dated, Aug. 5, 1978; Oct 14, 1979, Oct 21, 1979 and March 5, 1980.
- (31) The Daily Bangladesh Times, Dacca dated, Feb. 2, 1980 and Feb. 29, 1980.
- (68) The Weekly Begum, Dacca, dated Oct. 28, 1979.

(13)

Organisation Structure of the Corporation (BJMC)
and two sample enterprises.

In "A Study on Organogram of the BJMC" by Md. Saidul Islam, (44) the researcher expresses very clearly, the present organisation structure of the Bangladesh Jute Mills Corporation.

Ministry of Jute, represent the people who are the owners of the Jute Mills. The BJMC works, more or less, as the managing agent or the Board of Governors for the jute Mills. BJMC manages all the jute mills — on lines approved by the Ministry of Jute. The simplified structure of the BJMC will be as under :

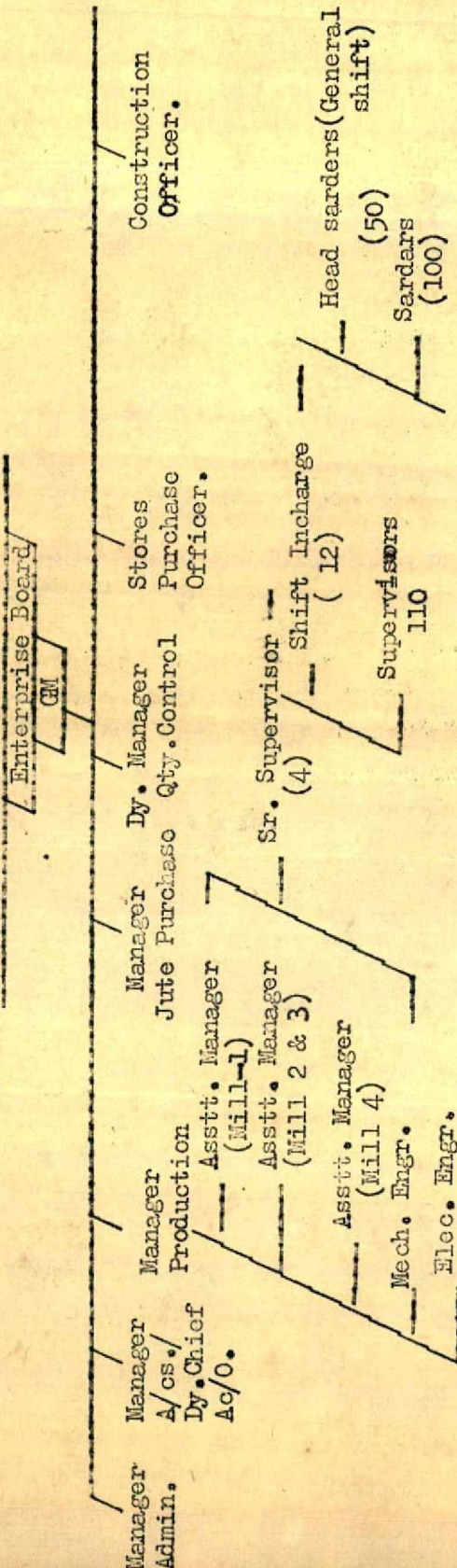


BJMC Board of Directors, under its supervision, forms in "Enterprise Board" for each of the enterprises under the BJMC who manages the affairs of the enterprise, according to the rules set by the BJMC and the Ministry. This board has the enterprise head as one of its members; head of administration/accounts become the member-secretary; BJMC nominates the Chairman. Besides, this board has representation from the Govt. and financial institutions, too.

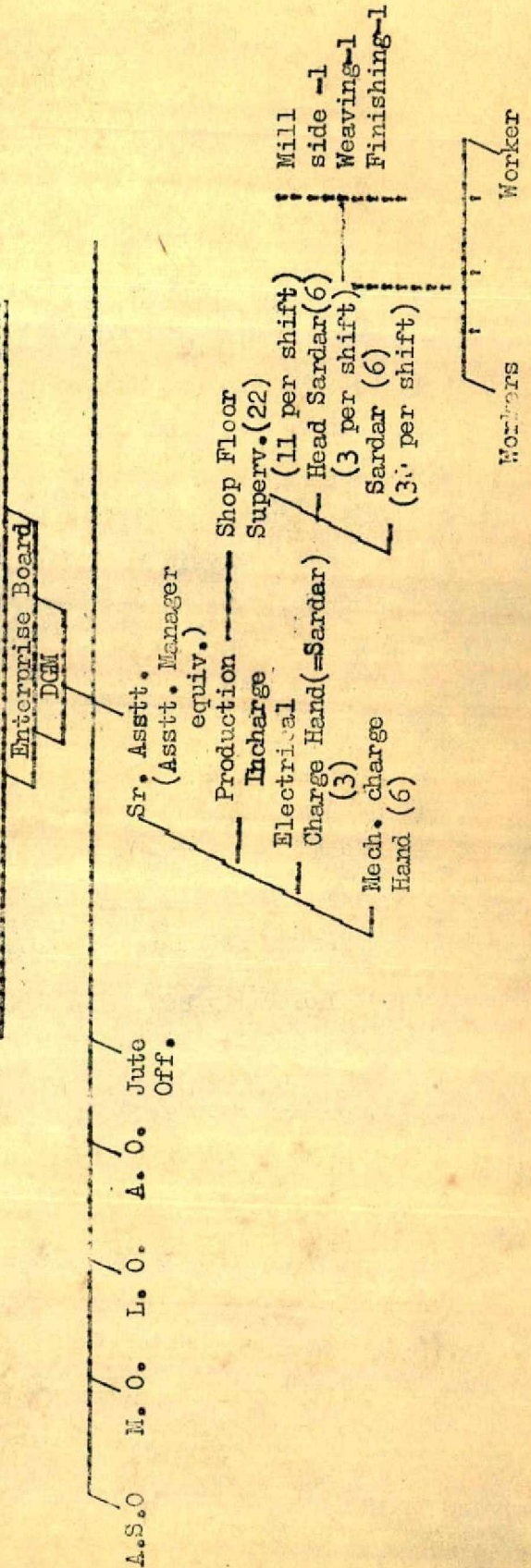
(44) Islam, Md. Saidul, "A study on the Organogram of the BJMC", Bangladesh Management Development Centre, Dacca, June 1979.

Figure - 14

"A" ORGANISATION STRUCTURE OF A SAMPLE
JUVE WILL OF BJMC



"B". ORGANISATION STRUCTURE OF A SAMPLE JUTE MILLS BJMC



(15)

THE EFFICACY OF THE PRESENT
INCENTIVE SYSTEM INSTALLED
BY BANGLADESH JUTE MILLS CORPORATION
PORATION

The incentive system employed by the BJMC does not lend itself to any definite conclusion about its efficacy. As was claimed by the BJMC, Cash incentives at the present rate, through reduction in wastage increases the total production of the industry by 11.5%⁽³⁰⁾. Whereas, another study by the BMDC ⁽²¹⁾, shows that there is no correlation between the cash incentives and the labour productivity of the jute industry. The trend analysis in 1.1 earlier, also supported this latter finding. It cannot, thus be said with confidence that the present incentive system of the BJMC, has worked or will work to yield any significant result (pp 115)

(21) Bangladesh Management Development Centre, Dacca.

" To Study The System of Payment by Results
In The Industrial Sector of Bangladesh and some
Asian countries", Jan., 1981.

(30) The Daily Bangladesh Observer, Dacca dated Sept. 5, 1978.

1. 4. Summary

While searching for the problem and trying to identify the problem area, we find that the jute industry has been suffering from some basic problems; its labour productivity and the over-all productivity have been gradually decreasing and that the present incentive system seems to have remained unsuccessful due to one reason or the other.

It thus seems that one of the most prospective problem areas will be the design of a proper incentive system that may remain dynamic and capable to adapt itself under any environmental conditions of the industry. It may perhaps be more practical and reasonable to keep the environment as dynamic and flexible as possible and not to try to control it artificially, while designing any such incentive system, because, in practice, many of the environmental factors, specially the external ones, can hardly be controlled or kept static.

A review of previous works and literature may be very helpful at this stage, to see whether any other works exist in the same problem area. The results of the review have been presented in the next chapter.

CHAPTER - 2

REVIEW OF PREVIOUS WORKS AND LITERATURE.

Pages 18 - 30)

2. 1. Some previous works on various aspects of the Industry.
2. 2. Current Methods of measuring absolute and relative productivity.
2. 3. Some noted theories on motivation and productivity.
2. 4. Chapter Summary.

CHAPTER - 2.

REVIEW OF PREVIOUS WORKS AND LITERATURE.

2.1. A review of the important previous works on the various aspects of the jute industry of Bangladesh reveals that the productivity of the industry is heavily dependent on and is seriously affected by the following factors :-

- i) Personnel problems and labour-management relations prevalent in the industry, ⁽²⁵⁾
- ii) The motivation mix or the composition of Maslows needs hierarchy, for the managers, ⁽³⁷⁾
- iii) The reward based incentive system installed under the present organisational environment of the industry, ⁽²¹⁾
- vi) The equipment conditions, working conditions, quality of raw materials, supervisory behaviour, ⁽⁴⁹⁾ and leadership pattern ⁽⁷⁾, the financial structure of the industry.

-
- (7) Akhtar, Begum Hamida and Anwar Md. Nurul, "Patterns of Leadership Behaviour and Labour Productivity" Journal of Psychology, Vol.7, University of Dacca.
 - (21) BMDC, Dacca, "To Study The System of Payment By Results In the Industrial Sector of Bangladesh and some Asian countries" Jan., 1981.
 - (25) Chowdhury, A. Momin, "Some Personnel Problems Problems of the Jute Industry of Bangladesh"
The Management Development
Vol. 7, No. 2, Oct. - Dec. 1978, Dacca.
 - (37) Habibullah, M. "Motivation Mix",
Bureau of Economic Research
University of Dacca, 1974.
 - (40) Habibullah, M., "Some Aspects of Productivity In The Jute Mills of Bangladesh",
Bureau of Economic Research, University of Dacca.

Ahmed, Quazi Kholiquzzaman⁽⁴⁾ in his doctoral study observed interzonal differences in labour productivity, that in his study was highest for Khulna and lowest for Chittagong.

Armitage and Norton Report,⁽⁵⁴⁾ made an investigation on the costs and productivity of the Jute industries in Pakistan and concluded that the principal causes of lower productivity of the industry were faulty management, lack of skill of labour and ineffective management techniques.

In 'Motivation Mix,⁽³⁷⁾ Habibullah, M. studied the applicability of Maslows' Need Hierarchy model on industrial managers in Bangladesh and the study presents a profile of the perceived needs of Bangladesh business managers. The study highlights the direction and the magnitude of motivational measures, for raising the productivity of the managerial people. This study did not consider workers, It was never applied by the jute industry.

However, the study concluded that Bangladeshi managers emphasised the following motivating elements :

- (i) Democratic and supporting boss.
- (ii) Attractive Pay.
- (iii) Fringe Benefits.
- (iv) Appreciation of work and recognition.
- (v) Sound Management Practices.

(4) Ahmed, Quazi Kholizuzzaman, "The Jute Manufacturing Industry of Bangladesh (1947 - 74)" Ph.D. Thesis, 1976, London School of Economics.

(54) Pakistan Jute Mills Association, "Armitage and Norton Report", June 1968, Dacca.

- (vi) Operational autonomy.
- (vii) Power and authority.
- (viii) Removal of Production Hindrances.
- (ix) Job Security.
- (x) Promotion Prospects.
- (xi) Opportunity for participation and growth.

In "Some Aspects of Productivity in the Jute Industry of Pakistan" (40) Habibullah, M. focussed upon the variables that correlated with the variation in the productivity level of industrial workers, under controlled, identical conditions of equipment, working conditions, supervisory behaviour and quality of raw materials. This study finds the following factors that are responsible for low productivity of the jute industry.

- (i) Inadequate maintenance of machines and equipments.
- (ii) Failure to make timely repairs, due to lack of adequate supply of quality spare parts.
- (iii) Authoritative attitude of supervisors.
- (iv) Lack of attention by management, to training of workers.
- (v) Imbalance of machineries.

Akhtar, Begum. Hamida (7) et al, in their study of "Patterns of Leadership Behaviour and Industrial Productivity", examined the effects of the dimensions of leadership, namely, structure and consideration, on group productivity in a jute mill of Bangladesh. Their conclusions were about dimensions in leadership effectiveness. Production was higher in groups having high structure leaders regardless of their degree of consideration.

The present researcher, in a research based article, (25) finds the following personnel problems, hampering the over-all productivity of the industry:

(1)

- (i) The authority tussle between the Administrative Officer, and the Labour Officer, the General Manager and the Unions.
- (ii) Disproportionate span of control.
- (iii) High rate of absenteeism.
- (iv) Non-uniformity of grades and scales of pay between some officers and assistants :
- (v) Insufficient/technical and managerial training.
- (vi) Antagonism/apathy of local workers to non-local workers.
- (vii) Inefficient and inexperienced management.
- (viii) Gigantic administrative machinery.
- (ix) Least, profit orientation.
- (x) Easy way of shifting responsibility.

In general, it may be observed that no such study has yet been made covering all the echelons of people in the nationalized industries of Bangladesh, together; no such study has yet been made that studied the ways and means of developing any incentive system, consisting not only of monetary measures, but also of all other measures --- that all the echelons of people (Managers, supervisors and workers) would like equally.

2.2. Current Methods of Measuring Productivity changes.

Current methods of absolute and relative measurement of productivity. These methods may be divided in the following main categories:-

- 1) Financial ratio approach⁽³³⁾ Important works have been done by Risk,
(59) Bahiri, ⁽¹¹⁾ Martin, ⁽⁴⁹⁾ Ball ⁽¹²⁾ and the I.F.C. ⁽²³⁾.

(25) Chowdhury, A. Momin, "Some Personnel Problems of the Jute Industry of Bangladesh" Vol. 7, No. 2 1978, The Management Development, Dacca.

(22)

- 2) Factor Productivity Approach⁽²⁴⁾ ---- In this approach, inputs are divided into Labour input and capital input. Mendrick⁽⁴⁶⁾ Read,⁽⁶³⁾ Vito⁽⁶⁷⁾ Chia-Hou,⁽²⁴⁾ Farrel⁽³⁴⁾ etc. have made valuable contributions in this direction.
- 3) Empirical Approach⁽³³⁾ ---- Significant amount of work has also been done in this direction by Bowery and Lupton⁽²²⁾, Amey⁽⁸⁾ Easterfield⁽³²⁾, Rice⁽⁵⁸⁾, Robertson⁽⁶⁾, Berl⁽⁷³⁾ and Rostos⁽⁶¹⁾ etc.

Prediction of changes in productivity ⁽³³⁾ Eilon, et. al. describes 3 important current methods for prediction of changes in productivity. These methods are ----

- a) Sensitivity Analysis ---- to establish the extent to which various criteria, as well as the system as a whole, are affected by a given incremental change of each variable.
- b) Deterministic Appraisal Method ---- to explore the effects of simultaneous changes in several variables. This analysis undertakes an assumed set of changes to trace their combined effects on the various components of the model.
- c) Risk Simulation Method ---- to predict changes by ranges of values, rather than by single estimates.

Methods presently available for measuring and predicting changes in productivities operate on the basis of an adequate understanding of the past behaviour, based on which, the analyst can attempt to make predictions about the future and about the possible consequences of certain alternative actions that may be taken.

All these methods are, more or less, based on trend analysis of productivity changes.

(24) Chia-chu Hou, "Role of Productivity in Asian Economic Growth" Asian Productivity Organisation, 1970.

(33) Eilon, Samuel, et al, " Applied Productivity Analysis For Industry" Pergamon Int'l Library, London, 1976.

Measuring productivity with the help of financial ratios, requires measurement of fixed investment which depends on the accounting procedures adopted by the particular organisation, for determining its fixed assets.

These procedures may vary from replacement costs of the plant, or reliance on inflation accounting, to gradual write-offs due to depreciation; each will have a significant impact on the computed productivity of the capital ratio.

A fundamental issue in any productivity analysis is that of measurement: how to measure multi-inputs and multi-outputs and how to determine plant capacity and utilization in a multiproduct system which involves sequential processing. Diverse conceptions tend to produce different findings. But each is relevant and significant to fulfil the desired objectives.

There is, therefore, a need for a multidimensional process. In as much as, any particular measurement of productivity or of its changes depends on the objectives to be fulfilled, developing any new method for predicting changes in productivity will also require clarification of the objectives guiding such efforts. It may also be recognized that different purposes are likely to require comparably differentiated measures.

2.3. Some noted theories^{(27), (36)} on motivation and productivity and their implications on the design of any incentive system for raising productivity

There are quite a good number of theories on motivation and productivity; each one of these has in its turn, some important implications on the design of any effective incentive system. The following are the important ones :

(36) Gellerman, Saul W., "Motivation and Productivity"

AMA, 1963.

(37) Chowdhury, A.Momin, "Management: Philosophies, Theories, Principles and Techniques", (under Publication) ERA PUBLISHERS, Dacca-7.

(24)

1. Freud's personality theory of motivation.

Freud concludes that by about 5 years of age, most of the broad outlines of the future personality are pretty well drawn. As the young child grows up, his instincts and environments are in constant contrast, gradually emerging as a stable personality pattern.

This theory implies that motivation of people will require the application of personality oriented incentives ---- differing from individual to individual.

2. Adler's power motive theory of motivation.

Adler holds that adults have conscious and subconscious power motives ---- motives to possess the ability to require others to behave in ways that suit one's purpose.

This develops in him, some Inferiority Complex and a strong desire for compensation.

Thus, according to this theory, incentives will have to be power oriented, if it is to become a successful motivator.

3. Whites' competence motive theory of motivation.

According to this theory, one of the main springs of human motivation is an interest to know his environment and to have a mastery over it, for getting what one wants from it. This is his competence motive.

In adults, the competence motive is very likely to express itself as a desire for job mastery and professional growth.

Thus, according to this theory, the incentive that possesses the ability to provide such opportunities will be more successful in motivating the subjects.

4. Whytes' money theory of motivation.

This theory suggests that money as an incentive is neither simple nor strong in its effect to affect the thinking and behaviour of production workers. As incentive, it is most effective where conflicts between the management and the workers are not too severe and where both groups feel the necessity of some unification of both groups' understanding. The impact of monetary incentives on motivation cannot be isolated from the worker's other motives.

Thus, money may not be a successful motivator where the above conditions exist.

The condition of the Bangladesh Jute Industry does not seem to be fit for the application of money as an Incentive (please see pp 135).

5. Schachters' affiliation motive theory of motivation.

When man loses control over his working environment, he feels insecure, loses pride and importance. He tries to recover these losses by affiliating himself with the formal or informal groups formed within the organisation, from time to time. These groups can create enormous pressure on him and such pressure may be helpful or harmful for the purpose of increasing his productivity.

Thus incentives should try to give him the feeling of security, pride and importance.

6. McClellands' achievement motivation Theory.

According to this theory, some people are more achievement oriented than others. People with a higher achievement orientation, feel a need for achieving something, even when the monetary value of that achieved is not something very great.

If a man is not achievement oriented, he can hardly be motivated by any incentive system, for higher productivity or accomplishment unless his achievement needs are developed by proper, intensive motivation training.

7. Maslows' need hierarchy theory.

According to Maslow, there are five basic needs that motivate people to work. These need are physiological need, safety need, love need, esteem need and need for self-actualization ---- felt in the ascending order of ones position in his organisation. Man tries to meet his most proponent needs first. Average man in the society is, most often, partially satisfied and partially unsatisfied. As man goes up in his needs hierarchy he remains increasingly unsatisfied. Most of a mans behaviour is multi-motivated.

8. Horzborg - Myer maintenance - motivation theory.

According to this theory, employee needs may be classified into two broad categories :

- a) Maintenance or Hygeine needs ----- comprising of demand for physical facilities, economic demands, social demands, demand for status and security.
- b) Motivational needs, calling for growth, achievement, responsibility and recognition.

9. Meaningful work theory of motivation.

A worker gets highly motivated if his works become more meaningful to him. i.e. if he can assume a significant part in the managerial functions associated with his job i.e. in planning, organizing and controlling the work he does.

10. Myers' manager motivation conditions theory.

Motivation of managers is dependent on the following :

- a) Interpersonal competence
- b) Opportunity to work towards meaningful goals
- and...c) Existence of appropriate management system.

11. McGregors' X - Y theory:

This theory gives 2 sets of assumptions termed by McGregor, as Theory X and Theory Y.

According to theory X, the traditional approach to motivation is by the application of a philosophy of management by direction and control, with authority - responsibility parity as the nerve of this philosophy. This is described as the traditional approach.

According to theory Y (another set of assumptions), a man would get more motivated, if management becomes people-oriented, if men are given more responsibilities and the freedom of his innovative motives.

12. Morse and Lorsch Contingency theory, of motivation.

There is always a contingent relationship between task, organisation and people; the nature, magnitude and complexity of this contingency may vary from time to time, place to place, strategy to strategy and people to people who are involved. The better will be the fit among these three ingredients, the more will the people get motivated.

13. Mayo's human Relations theory of motivation.

It concluded that informal groups when formed, could cut both ways, as far as productivity was concerned. When the group associated itself with management, productivity increased. The more the group was given mastery over its job, the more was the group output. When workers

are treated impersonally or are controlled excessively, the group felt itself to be in opposition to management, it lost its trust on management and productivity dropped.

14. Likert and Katz supervision theory of motivation.

Supervision may be production-centred or employee-centred. According to this theory, the employee-centred supervisors are more productive than the production-centred ones.

All these theories cover, in pieces, the various aspects of efficient and effective motivation; each is inclined toward a certain direction, ignoring or underestimating other directions, even if important. In all of them, the magnitude has been left open. Thus, combining more than one of all these theories may yield a far better result than that may be obtained by applying any one theory only.

It remains therefore to develop a generalized method/model which will be able to cover all possible factors affecting the over-all productivity of any system.

SUMMARY AND CONCLUSION:

Previous works on various aspects of the jute industry indicate the various directions of problem areas and their possible remedial measures. Those may be a very good starting point for designing a generalized flexible model of incentive system.

Various available methods of measuring absolute and relative productivity, rely mostly on trend analysis of past behaviour of the industry in question, with serious limitations of the assumptions on which these methods are based.

None of the available theories on motivation and productivity can be used alone for the design of any incentive system with predicted changes in production.

As we have seen earlier, the present incentive plan installed by the BJMC, which is the application of the Scanlon Plan (Whyte's Money Theory of Motivation), cannot be said to have worked with any undisputed success. It therefore remains to develop a new theory/model that may fit itself with any environmental condition of the industry for which it will be applied. The newly developed model should have minimum limitations of assumptions and should have the greatest possible flexibility.

We are now in a position to set the rationale of the choice of our study, locate the problem area, define the problem, set the objective of the study, define the working concepts, frame the working hypothesis, and the hypothesis proper, choose the methodology and discuss it and clearly identify the limitations of our study. All these have been presented in the next chapter.

(30)

C H A P T E R - 3.

PROBLEM DEFINITION, HYPOTHESES
METHODOLOGY AND GENERAL DISCUSSION.

(Pages 31-55)

- 3.1. The Rationale of the choice of study.
- 3.2. Problem definition and objective of the study.
- 3.3. The Hypotheses.
- 3.4. The methodology and General Discussion.
- 3.5. Limitations of the Study.

THE CHOICE OF THE AREA OF STUDY.

The incentive system installed by the BJMC, though based on the Seamlon Plan did not work to any significant extent. Nor is there any study that can determiningly say which kind of incentive may work or which theory may be applied.

There is, then, no point in taking hit-and miss measures in trying to improve the overall productivity of the industry. This resulted in the idea to undertake the present study of finding out a method for designing an incentive system that will be equally accepted by all the workers, the supervisors and the managers, and for prediction/measurement in advance, of the possible effects on the over-all productivity of the industry, whenever any incentive system, cash or kind, or both, is designed for the jute industry of Bangladesh in particular and the nationalized industries in general.

The underlying assumption is : Before installing any incentive system, if it could be known in advance that it would be equally accepted by the workers, the supervisors and the managers of the industry, and if the increase in the total production and thence in the over-all productivity could be measured/predicted, it would save the industry from the sheer uncertainty it is passing through, at the moment. If such a method could be found out, it would be of a great benefit to the country for all time, to come, and hence the choice of the area of the present study, having its foundation on the sense of direction indicated to some extent, by the Contingency Theory and to some extent, by Maslow's Need Hierarchy Theory ---- with the aim and objective of developing a new theory towards the formulation of the incentives that would remain most effective in raising the productivity of the industry, under any of its prevalent organisational environments.

SOME WORKING CONCEPTS.

Once we have defined the problem and set the objective of the present study, it may now be logical, sequential and a good starting point to start with some working concepts of those terms that will be

frequently used in developing our hypotheses, thesis and theory. The important and frequent ones are attitudes, productivity, over-all productivity, incentive, incentive system, motivation, organisational environment and preference schedule of incentives, etc.

Attitude - This has been used to represent one's thoughts, beliefs, or perceptions with regard to something.

Over-all productivity - This has been used to mean a ratio of outputs to inputs taken in terms of money. The inputs may broadly be classified into 3 categories, viz. human input, material input and money input. The output has been taken to mean the value of the output in terms of its physical weight in tons.

Thus, the Over-all productivity

$$= \frac{\text{Total Yearly production, tons}}{\text{Total value of all inputs Taka}}$$

Productivity or Labour-productivity - This has been used in the sense of Labour-productivity and has been defined as

$$= \frac{\text{Physical value of output, Tons}}{\text{Total number of labour employed, man-yrs.}}$$

Organisational Environment - This has been used to mean any factor, situation, element, condition, within or around the organisation, that have some definite influence ----- direct or indirect, large or small, on the functioning of the organisation. We may say that anything that affects the functioning of an organisation, is an element of the total environment of that organisation.

PROBLEM DEFINITION AND OBJECTIVE OF THE STUDY .

In its wider dimension, the problem is to find out ways and means to improve the over-all productivity of the jute industry and to increase the contribution of this industry to other sectors of Bangladesh economy.

In a less wider sense, the problem is, how to design an effective incentive system. In the narrower sense, the problem is to select those incentive measures with their predicted effect, that will keep all the different levels of people of the industry, equally satisfied, while leaving the environment uncontrolled, dynamic and relative; the efficiency of the selected incentive measures should also be predicted.

The objective of the study is, therefore, to develop a methodology for designing an incentive system for the jute industry in particular and the nationalized industries in general. This incentive system will have to be accepted by all levels of people of the industry,

Thus, in a narrower sense, the objective has been to select all those measures that will be accepted by all in the industry.

One of the sub-objectives of the study will be to develop a method for predicting, with a certain margin of error, the expected changes in production or benefit, due to application of those incentive measures.

THE WORKING HYPOTHESIS AND THE HYPOTHESES PROPER.

In order to realize the objective of the study, some working hypothesis has been framed first. Review of literature (35), (42), (43), (52), (53), and discussions/communications with people on the line paved for transformation of the working hypothesis into some definite workable hypothesis.

-
- (35) Goode, William J and Hatt Paul K., "Methods in Social Research", McGraw Hill 1935.
- (42) Ichira Nakayama, "An Introduction to Productivity" -Asian Productivity Organisation, 1963.
- (43) Ichira Nakayama, "Raising Productivity", ILO, 1959.
- (52) Moser, C.A., "Survey Methods in Social Organisation" Heinemann, London, 1958.
- (53) O' Shangnessy, J. "Business Organisation", Allen and Unwin, London.

THE WORKING HYPOTHESIS.

Man's behaviour expresses his innate motive and each behaviour has a motive behind. By behaving in a particular manner, man tries to satisfy some particular motive. Thus, motivation is the inspiration/driving force to behave in a particular manner, with an objective to reach a certain goal .. to satisfy some particular want .. realize certain objective(s).

Incentives are the vehicles - the means to motivate, with an expectation of getting certain behaviour pattern. Whether this incentive will be able to do its job, will depend, to a great extent, on the attitude of the subject towards that particular incentive. 'Attitudes are gauged by examining opinions and reactions', 'his attitude score on any measure is the average of all score-values he has marked' (3).

It is therefore, possible to prepare a Preference/Rank Schedule of Incentives that will be most effective in increasing the over-all productivity of the industry, by measuring a battery of attitudes of workers, supervisors and the management. And it will be possible to rank the various incentives/measures, in order of their effectiveness in increasing the over-all productivity of the industry.

It may also be possible, to measure and predict the magnitude of the expected increase (within certain limit of error) in the over-all productivity - resulting from the installation or application of those incentives.

HYPOTHESES PROPER.

- (i) The best incentives are those that keep the various levels of people in the industry equally satisfied; those incentives will be indicated by the synchronized attitudes of managers, supervisors and workers - inter-echelon and inter-regional. This synchronization will be done by measuring the insignificance of difference of satisfaction due to any particular incentive measure.

For this, the statistical tool of Variance Analysis will be applied.

(ii) The attitudes of managers, supervisors and workers may vary in their preference towards various incentives, but there will be some incentives for which all these levels will show a similar positive or negative attitude - varying only in the degree. The Preference Schedule for which all these 3 levels show their indifference is determined by the ratio of the variances of their mean attitudinal scores in ranks for those incentives. Conversion of the mean attitudinal score in ranks into their centile values will determine the expected increase in the total production due to the incentive in question.

(iii) The insignificance of difference of the average attitudinal scores/ranks, for a defined confidence level, will bring out those incentives that will equally motivate people of all levels i.e. managers, supervisors and workers.

(iv) Corresponding to the desired level of confidence, significance and accuracy, a selector,

$$M = \frac{F_1^{\max}}{F_1^{\min}} = \frac{(s_i^2 / s_o^2)^{\max}}{(s_i^2 / s_o^2)^{\min}}$$

will select the incentives, that will give indifference of satisfaction to all levels of people covered by the attitude survey.

Here, s_i^2 = Variance of the item's mean score.

s_o^2 = Variance of the mean score of the sample
(of any level)

(v) The type of incentives that will result in the highest possible increase in productivity in any industry, at any given period of time, will depend on the organisational environment of that industry at that period.

- (vi) The extent to which people working in any industry will get motivated, will be determined by the over-all attitude of the people towards various incentives and productivity, the attitude being formed by the interaction of the prevailing environmental elements/factors.
- (vii) A change in the environment of the industry will bring some change, though slow, in the attitude of the people towards the desired incentives.

METHODOLOGY AND GENERAL DISCUSSION.

Based on the hypotheses already framed as the basis of the present study and discussion and communications with UNDP-UNIDO experts engaged in the development of the jute industry of Bangladesh, I.L.O. - UNDP experts engaged in management development programme in Bangladesh, management personnels of the jute industry and University professors of international repute in the fields of Industrial Psychology, Industrial Sociology, Organisation Development and Organisation Behaviour, the first, 7-rank, unidirectional scale termed as AIP (Attitude towards Incentives and Productivity) Survey Questionnaire was designed and it composed of a battery of 30 incentive measures, both monetary and non-monetary, covering all perceivable major factors that may result in or aid in getting a higher level of output ----- changing only one input at a time. All these measures are fully consistent with the measures qualitatively suggested by the previous studies on the various aspects of the industry, as has been mentioned in Chapter - 2 (pages 18-21).

Recourse to Attitude Survey: Pros and cons

If recourse would not be taken to attitude survey, the only alternative would be to go by historical data.

While the history of the jute industry will give the results of measures that failed to make the industry profitable, any attempt to extrapolate those results for diametrically opposite results, may well bring the industry to a total doom. It has therefore been felt that

(37)

extrapolation of past data should be avoided as far as practicable.

As the next best alternative, the choice fell on the attitude survey method mainly on 2 considerations - (i) incentives, the perceived agents capable of satisfying the needs/ wants of the subject, are sure to change from time to time, depending on man's attitude towards them, and (ii) a better bargaining is possible, if the proper incentives, suitable for any particular people, time and place, are known beforehand, by studying the prevalent attitudes of the affected.

PRINCIPLES OF THE DESIGN OF THE AIP SCALES.

The AIP Survey Questionnaires were designed on the following principles :

1. The attitude of an employee/worker/supervisor/Manager of the Jute Industry toward a set of incentives and the over-all productivity of the industry, is defined as the average or the median scale value of statements he has checked ---- the average or the median being determined by taking the algebraic sum of the scores (to avoid - Jaergansens' Effect). (Thurstone Type of Scale)⁽⁵³⁾⁽⁶⁶⁾.
2. By using about 30 incentive items/motivational measures, each having 7 unidirectional degrees of preference, the sum of the scores of the responses checked will constitute a measure of one's attitude toward those measures and their effectiveness in increasing the production. On the 7-rank AIP Scale the point of indifference is rank -2 where the respondent cannot decide. (Likert Type of Scale), the 'zero' point being at rank-1. Because of the unidirectionality of the scale, it does not register any unfavourable attitude toward any measure mentioned in Survey Questionnaire.

The 8-rank scale with 33 items, is a further modification of the 7-rank scale used in the test-survey or pilot-survey.

(53) O' Shanguessy, J, "Business Organisations", Allen and Unwin London.

This has been designed to serve two important purposes :

- (i) to register any clear negative qualitative attitude toward any incentive item/motivational measure, in its efficacy to raise production.
- (ii) to pick-up the negative attitude if any, without sacrificing the validity of the scale.

TESTING THE VALIDITY AND RELIABILITY OF THE AIP SURVEY QUESTIONNAIRE.

AIP stands for Attitude toward Incentive and Productivity. The purpose of the survey was to register the attitude of the sampled population, toward various types and forms of incentives that may keep a positive contribution for a higher productivity of the jute industry. The AIP Survey Questionnaire was a vehicle/media for registering those attitudes.

Thus, the questionnaire was composed of various measures covering all possible factors that may result/aid in getting a higher production, changing only one input or applying only one incentive measure at a time.

With the first AIP Survey Questionnaire, a trial run was given on a group of 18 supervisors from the Chittagong Zone (Sub-sample CS-1). This was a 7-rank, undirectional scale, having its 'zero' at rank-1, and its hundred at rank 7. This was a 30-item (incentive measures) questionnaire. The attitude scores of the subjects for all the items in the questionnaire determined his over-all attitude toward incentives and productivity of the jute industry.

The results of this first survey were used to determine -

- (i) Sample size at $\alpha = 0.05$, and the standard Error of the Mean = 5%.
- (ii) Reliability of the scale.
- (iii) Validity of the scale, and
- (iv) Changes in Questionnaire to overcome the observed short-falls.

The results are shown on pages 120 - 121.

The AIP Survey Questionnaires (7-rank or 8-rank) were designed to measure the attitudes of the subjects, such that by summarizing data for all the respondents within any sub-sample/group, the over-all attitudes of the group toward any particular incentive item/motivational measure could be quantified which then could be compared with that of other sub-samples/groups/categories/echelons.

Reliability of the AIP Scale.

Both the 7-rank and 8-rank AIP Survey Questionnaires were applied on the same group of managers (n=16) and on two different subsamples (DS-1 & KW) and result of the scores on both the scales showed no significant difference between the over-all scores, at a confidence level = 95% or $\alpha = 0.05$ (please see page 126). This proves the reliability of the scale.

Split-half test (chance halves) was performed for all the sub-samples/groups, by determining Pearson's r. The results as shown and tabulated on page 159 indicate the reliability of the scale in general, as is indicated by the critical value of r, for the sub-sample in question (page 144).

Validity of the AIP Scale.

Validity of the scale was tested as under:

- 1) Discussion with Dr. V.G.E. Powell and Professor V.L. Thomas (Manchester University) resulted in the design of 8-rank scale - which is but a more specific version of the 7-rank scale used for the test-run on the first group of Chittagong Supervisors (DS-1). Final sampling has been conducted with this 8-rank AIP survey Questionnaire.
- 2) Items belonging to the same category has been grouped together and their co-efficient of variations have been determined (pp. 120).

Sampling Plan.

Since supervisors are mobile and are frequently transferred from one mill to another mill, but mostly remains in one zone, it was felt necessary to take samples from the three zones (Dacca, Chittagong and Khulna) separately.

Since they stand in between the managers and workers, their attitudes will be formed by the influence of the physical environment of the industry, the managers' influence and the influence of the workers jointly. It was therefore felt that their attitudes will be well reflecting the real situation. So, they were sampled zonally, at the training camps or centres of BJMC.

The managers being often transferred not only from mill to mill, but also from zone to zone, it was felt that there will not be any use to sample them mill-wise or zone-wise. And accordingly, they were sampled centrally in Dacca at BJMC when they came here for training.

At present, (taking the figures of March '79)⁽¹⁵⁾ the workers of all categories together number 2,05,355 (1,47,003 being in attendance). But within any zone (Dacca, Chittagong or Khulna), they usually remain so much in touch that differences in attitude either due to the size or the environment of the mill, was taken to be very insignificant.

But 29% of the total workers of the BJMC are in the Khulna Zone. Many of them hail from the other two zones and hence are in constant touch with workers working in those two zones.

Kholiquzzaman's⁽⁴⁾ study ranked the productivity of the Khulna Zone workers as one, whereas analysis of March '79⁽¹⁵⁾ figures (page 192) ranks Khulna as three (.233 tons/year/worker.)

(4) Ahmed, Quazi, Kholiquzzaman, "The Jute Manufacturing Industry of Bangladesh (1947 to 74)", Ph.D. Thesis, 1976, London School of Econ.

(15) Bangladesh Jute Mills Corporation, "Production Efficiency For The Month of March 1979", BJMC, Dacca.

Moreover, in our study, variance analysis has been planned to be used to note the inter-echelon (Manager-worker, manager-supervisor, supervisor-worker) variation of the over-all attitudinal scores in ranks for each incentive item in the attitude survey questionnaire.

Since sampling of supervisors have been planned zone-wise, it was thought that only 1/2 sub-samples of workers will be enough for the purpose of our study.

Hartley's maximum F for the variances of each item score ranked by any echelon, will select those incentive measures that results from the indifferent attitude of all echelons (managers, supervisors and workers) toward that incentives.

It was therefore planned to take only two sub-samples from the workers: One from the Khulna Zone alone and the other from Dacca and Chittagong zones together.

Crescent Jute Mills have the highest number of workers (9,660 out of 59,588) in the zone. Hence workers (upto Head Sanders) have been sampled from the Crescent Jute Mills only. 10 workers (1 from each mill) from the Adamjee Jute Mills and 11 from the Chittagong Zone have been sampled and grouped as one sub-sample.

Size of sub-sample.

Sample survey of worker by scheduling of the AIP Survey Questionnaire having 33 items on various types of incentives, is, by itself, a formidable job; sampling one subject requires about 2 to 3 hours.

There was therefore hardly any rational choice than to work with a small number of workers. In this case of Crescent Jute Mills workers, the sample size was 21.

For supervisors and managers the sample size was around 20, taken twice for each group, to take care of any change in attitude within the period of the study.

The 7-rank AIP Survey Questionnaire used in the Pilot Sampling with a group of Supervisors in the Chittagong Zone, gives the standard Error of the Mean Score = 30 or 7.5% and the co-efficient of variation of the Mean Score was obtained as $\% \frac{n_1}{n_2} = \frac{d_2}{d_1}$ gives a sample size, $n_2 = n_1 \times \left(\frac{d_1}{d_2} \right)^2 = 18 \times 2.25 = 42$, where we want to keep the standard error of the mean attitudinal score of the final sample at 5%.

However, to cover the changes of diagonally opposite attitudes of the workers, supervisors and managers towards various incentive measures, and to take care of other defects and deficiencies in the survey, the actual sample size was extended to 204 according to the following plan, maintaining the total sample size from each region (Dacca, Chittagong and Khulna) bigger than 42, which is the required minimum, to keep the standard error of the mean within 5%.

SAMPLING PLAN FOR THE SUB-SAMPLES.

Zone	Dacca	Chittagong	Khulna	General	Total
Echelon					
Managers				NJ = 21 ME = 10 M-NI=16/16*	47
Supervisors	DS-1=20 DS-2=22	CS-1 = 18 CS-2 = 16	KS-1 = 27 KS-2 = 19		114
Workers	10 ^a (Adamjee)	11 ^a (General)	n = 21 (Crescent)		42
	52	45	57	47	205

MJ = Managers, Jute Mills.

ME = Managers, Export, Jute Mills

* M-NI=Managers, Nationalized Industries in general.

= 16 for Test,

= 16 for Re-test

+ 2 from each of the 5 mills

a Workers from Dacca and Chittagong has been grouped into 1 sub-sample.

PREDICTIVE EFFICIENCY OF THE AIP SCALE USED.

pp 114, Peatman, John G. "Introduction to Applied Statistics"
 Harper and Row '64, give the Index of Predictive Efficiency
 as $E = (1 - k) 100\% = (1 - \sqrt{1 - r^2}) 100\%$

where r = Pearson's Co-efficient of correlation.

Table 6 of the Appendix of the book gives the values of E
 corresponding to that of r .

For the AIP Scale, the weighted average value of E 's of all
 the sub-samples has been estimated to be 28.5% (page-101).

Predicted change in production.

The rank scale has been converted ~~into~~ a centile-scale. In order
 to get the predicted change in production due to the application of any
 incentive/motivational measure, the mean value of the change in produc-
 tion, obtained from the survey was multiplied by this efficiency of the
 AIP Scale.

Determination of the Predictive Validity and Reliability
 of the AIP Scale by comparison between predicted value
 and historical data.

Reported loss or gain in production in the jute mills, due to
 any external or internal factor, same or equivalent to any item(s) men-
 tioned in our Scale, has been used for the determination of the Predic-
 tive Validity and Reliability (co-efficient) of the AIP Scale used.

Where data on global basis were not available for any measure/
 item, data available on any particular mill were used for this purpose
 of comparison. The % difference and the Spearman's Co-efficient of Co-
 rrelation were determined. The result has been shown on pages 75 and 147).

TEST OF RELIABILITY OF MEASUREMENT OF % NET
CHANGE IN PRODUCTION FROM % GROSS CHANGE IN
PRODUCTION DUE TO ANY INCENTIVE.

Method used for getting the gross change in production may be described as under :

From the response by the subjects of the subsample CS-1 used for the test run of the AIP 7-rank scale, the cumulative frequency distribution curve has been drawn, taking the ranks in the abscissa and the cumulative % of the ranks' total score as the ordinate (pages 145, 146 and 147).

The same curve was drawn for subsample DS-1, with the 8-rank AIP scale and the mean of the two curves has been taken as the required conversion curve and has been used for taking the values of p , the predicted gross change in production, due to any incentive/measure.

The net % change in the total production predicted, has then been obtained by multiplying the gross % change in total production (p_g) by the weighted Average Predictive Efficiency of the AIP scale used for the survey.

The Wtd. Ave. Predictive Efficiency of the scale has been defined as $E = \frac{e_1 n_1 + e_2 n_2 + \dots}{n_1 + n_2 + \dots}$

where,

$e_1 \dots$ = predictive efficiency of the scale with subsample 1 (CS-1) having a size of n_1 , and so on.

$$= (1 - \sqrt{1 - r_1^2}), \text{ where}$$

$r_1^2 \dots$ = correlation coefficient of the two halves of items of the subsample, as determined by the split-half method (reliability test), and so on.

$n_1 + n_2 \dots \dots \dots = N =$ Total number of samples. Example: The weighted average attitudinal score for an item is 4.5 in terms of ranks. From the Conversion Curve, this corresponds to 50% of change in the total production, due to that item/measure. The wtd. Ave. Predictive Efficiency of our AIP scale is 28.5%.

$$\therefore \text{The net \% change in the total production} =$$

$$.285 \times 50 = 14.25\%$$

Test of reliability of such a measurement.

With subsamples DS -1 and KW(crescent workers) another approach has been made for selection of items and for getting the net % change in the predicted change in production, due to any item/measure.

In this approach, the net % change in production was calculated as under :

$$p_n = p_g \times r_a^{12} \times (1 - C)$$

$$r_a^{12} = \frac{\sqrt{\frac{x_1^2 + x_2^2}{n_1 + n_2}}}{\sqrt{\frac{x_1^2 + x_2^2}{n_1 + n_2 + x_1^2 + x_2^2}}}$$

$$C = \frac{\sqrt{\frac{x_1^2 + x_2^2}{n_1 + n_2 + x_1^2 + x_2^2}}}{\sqrt{\frac{x_1^2 + x_2^2}{n_1 + n_2 + x_1^2 + x_2^2}}}$$

$$x_1^2 = \frac{|f_{01} - f_{e1}|^2}{n_1}$$

$$= \frac{|R_i - R_o|^2}{n_1} \quad (\text{assumption})$$

where, r_a^{12} = Correlation coefficient of attributes

C = Contingency coefficient.

R_i = Attitudinal score of the item in ranks.

= subjects score on each item, in ranks.

R_o = subjects over-all attitudinal score, in ranks.

= subjects average score on all items in ranks.

(46)

Results of the test of reliability of measuring
net% change in production, $(p)_n$

Results show (page 147) that the % difference between net % changes in production as measured by the two independent methods is 0.4% and Co-efficient of Rank Correlation is 0.81, which confirms the reliability of measuring net % change in production by the Weighted Average Predictive Efficiency method.

ANALYSIS OF DATA.

While analysing data, variances of the item's average score for all the respondents in any sub-sample have been determined and designated as s_i^2 . Similarly, variances of mean score of all the items in the questionnaire, by each respondent of any sub-sample have been determined and designated as s_o^2 . Ratio $\frac{s_i^2}{s_o^2} = F_{i-o}$ was determined for each item of the questionnaire in each sub-sample. This process of calculation was adopted to take care of the group characteristics/divergence/peculiarity, if any.

The ratio between the maximum value of F_{i-o} and the minimum value of F_{i-o} for any one item of the AIP Questionnaire, between all the sub-samples has been calculated and termed as $(F/F)_{\max.} = M$. Hartley's maximum F-ratio value for the corresponding degrees of freedom (in this case 20) and number of groups/sub-samples (in this case, 11) has been taken as F_c i.e. the critical value of the maximum F-ratio test for the item.

Any value of $M = (F/F)_{\max.}$ that was less than the corresponding value of the F_c (i.e. Hartley's maximum F) was taken to indicate the general acceptance of all the subjects of all the sub-samples and hence, of the population i.e. of the managers, supervisors and the workers of the jute industry.

Ratio $(F/F)_{NI-MG}$ shows the ratio of F_{i-o} for all items of the questionnaire the two sub-groups - Manager-General(Jute) and Managers (Nationalized Industries). The value of $(F/F)_{NI-MG}$ less than F_c shows the indifference of attitudes of managers in the jute sector and in the nationalized industries sectors in general, towards the corresponding item/measure.

In fact, item thus selected by all the 11 sub-samples may be equally adaptable/applicable to all the nationalized industries.

$(F/F)_{T-RT}$ is the ratio measuring the degree of indifference/ or difference) between two AIP Questionnaires - the 7-rank one and the 8-rank one; T-RT stand for Test-Retest. This test also measures the validity of the AIP Scale used.

Groups I, II, III, IV, V, VI, VII, VIII, IX & X classifies same or similar items. The values of $(F/F)_{max.}$ (= M) less than those of F_c (Hartley's maximum F) proves the validity and the reliability of the AIP Scale (pages 129-142).

Ratio $(F/F)_M$, $(F/F)_{CS}$, $(F/F)_{DS}$, $(F/F)_{KS}$ and $(F/F)_S$ less than the corresponding values of F_c shows the degree of agreement of indifference between the managers (general, export and nationalized industries), supervisors of the Chittagong Region, supervisors of the Dacca Region, Supervisors of the Khulna Region and the supervisors of all the regions respectively.

Then $M = (F/F)_{max.}$ shows the over-all degree of difference between managers (of the jute sector and the nationalized industries), supervisors and workers of the jute industry in general (pages 59- 63).

Items having M the value of this ratio less than the corresponding value of the Hartley's maximum F-ratio resulted in the selection of a Preference Schedule of items/incentive measures unanimously selected by the managers, supervisors and workers of the jute Industry, under its present organisational environment. Table 30-31 presents them in

order of their ranks. (page 67 - 70)

The over-all mean score of the selected item/incentive measure has then been converted into the gross percentage increase in production, by using the Centile graph of the AIP Scale as shown in page 146.

The Predictive Efficiency of the 8-rank AIP Scale (28.5%) has then been used to calculate the effective/net predicted increase in the total production of the industry, by applying those selected items/measures of the Preference Schedule (pages 145 and 147).

Historical data available from different sources have been redressed for the purpose of comparison or correlation. The reported loss or gain in production due to the absence or presence of items/measures/causes similar to or same with items/measures used in the AIP Questionnaire, have been compared with the effective/net predicted increase in production due to those measures. The available capacity was calculated to be 21% (page 164). The effective predicted increase in production was calculated for the items of the AIP Questionnaire was calculated in terms of this capacity also. A comparison, similar to above, has been made.

The results of both the comparisons have been shown in Table 32 (page 75).

RESULTS OF ANALYSIS: OBTAINING MEAN ATTITUDINAL SCORES,
THEIR CONVERSION TO PERCENTAGE NET CHANGE IN PRODUCTION:

FRAMING THE PRODUCTION PREFERENCE SCHEDULE OF INCENTIVES
AND THE BENEFIT PREFERENCE SCHEDULE OF INCENTIVES.

While analysing data, the maximum value of the selector

$$M = \frac{(F_{i-o})_{\max}}{(F_{i-o})_{\min}} = \frac{(S_i^2 / S_o^2)_{\max}}{(S_i^2 / S_o^2)_{\min}} \quad \text{has been found to be } = 4.49, \text{ from }^{58}$$

Hartley's Table of maximum F-ratio, corresponding to $K = 3$ & $df = 20$.
Items of the AIP scale having weighted average attitudinal score greater

than or equal to 4.00 have been tested for their individual M, whereby, items w,i,f,e,u,n,o,s,c,g,j and l have been selected to form the Preference Schedule in order/ranks of the values of their weighted average attitudinal scores. The weighted average attitudinal scores $\bar{X}_{\frac{x}{x}}$ of the population for each item of AIP scale were determined as follows :

$$\bar{X}_{\frac{x}{x}} = \frac{\bar{X}_1 n_1 + \bar{X}_2 n_2 + \dots}{n_1 + n_2 + \dots}, \text{ where}$$

$\bar{X}_{\frac{x}{x}}$ = Average attitudinal score of subsample 1

x_1 = Average attitudinal score for item 1

n_1 = size of subsample 1.

The predicted gross average percentage values of the change in production, $(p)_g$ were determined from the average percentile value of the wtd. ave. attitudinal score from the two centile graphs, namely,

- 1) AIP 8-rank Centile Graph for the sub-sample DS-1.
- 2) AIP 7-rank Centile Graph for the test sample, CS-1.

The average value falls on the average Centile Graph (Cumulative Distribution of proportionate frequencies) of the AIP 8-rank scale (page-43).

To avoid any ambiguity in the conversion, items having weighted average attitudinal scores less than 4.00 have not been considered in constructing the Preference Schedule of Incentives/Measures, even when their M-value was far below the critical margin. This is one of the limitations of this AIP scale.

The effective changes in production, $(p)_n$ were calculated by multiplying the gross values by the weighted average prediction efficiency, E% of the AIP scale, (page 161).

For implementation, the order/rank of preference has been prepared on the basis of predicted or estimated magnitude of the net benefits expected to be accruing from the selected items' implementation.

For items' C and O, net benefit was shown to be zero, stressing thereby the maximum extent to which these measures may safely be implemented mostly from socio-political point of view. And it may be observed that under the present conditions of international market and the environmental conditions of the industry, the maximum amount that may be spent on the facilities like housing, should not exceed Tk. 20 crores. Converted in terms of sales price of jute goods, this comes to be about 2 tons per worker per year.

The same is true for Cost-of-Living Allowance, too, if any. In this case, the maximum amount comes to be the sales price of 1 ton/yr./worker.

In the AIP Scale, item U stands for replacement of old machines and the predicted net benefit accruing is equal to Tk. 6.00 crores per year. Whereas, in another study⁽⁴⁷⁾, the estimated net benefit is about Tk. 40 crores per year, which difference is due to the Balancing and Modernization effects and which difference is quite expected.

Good quality jute, if supplied to the machines, will give a higher yield but the industry will, with all probability make more losses, because of high cost of raw jute and low price of jute goods.

Limitations of the Cost-Benefit analysis.

While estimating the cost-benefit analysis of items/ measures of the AIP scale, the average sales value of the jute goods was taken to be Tk. 8342 per tons⁽¹⁴⁾, the value of raw material + capital was taken as Tk. 5000⁽¹⁰⁾ per ton and the cost of selling was calculated at 5% of the sales value.

(10) Ascar I.H., "UNIDO-UNDP Report on BJMC", Oct 1, 1978, BJMC, Dacca.

(14) Bangladesh Bank, "Selected Economic Indicators" Nov. 26, 1979.

Similar other assumptions were made that may be found in respective, selected items (pp 163-175). These may limit the merit of the estimations. But there is hardly any other way to escape these limitations/assumptions.

Benefit Preference Schedule of Incentives.

pp 159-163 show the values of the selector $M = \left(\frac{F_{i-o} \max}{F_{i-o} \min.} \right)^{p_g}$,

the weighted average attitudinal score ($\bar{X}_x$), predicted average gross change in production due to the measure/item (p_g), predicted effective change in the total production due to the measure/ Item, (in % and in tons/year), gross revenue expected to be derived at sales price of 1978-79⁽¹⁴⁾, cost involved in the implementation of the measure/item, Net Annual Benefit predicted to be derived, suitability, S, for implementation of the selected measure, and the order/rank of preference for implementation from the industry's health point of view. In other words, it gives us the Benefit Schedule of Incentives. selected unanimously by all connected people of the jute industry under the environmental conditions of the industry prevalent during the study period, i.e. 1977 through 1980.

For any other environmental conditions of the same industry, people may select any other Incentive Schedule which may or may not differ much with the present schedule, depending on the extent of changes occurring in the environmental factors influencing the attitude of people connected with the industry, towards incentives and productivity. But in any case, the methodology for constructing the Schedule will remain the same or similar.

LIMITATIONS OF THE PRESENT STUDY.

The present study develops a methodology for designing a flexible and dynamic incentive system for the jute industry of Bangladesh in particular and for the nationalized industries in general, under any prevalent organisational environment of the industry in question.

It results in the preparation of two schedules ---- one in order of ranks of predicted change in the total production, and the other, in order of ranks of predicted net annual benefit accruing from the measures of the designed incentive system. These two schedules have been mentioned in the study as the Production Preference Schedule of Incentives and Benefit Preference Schedule of Incentives. Whenever the environmental factors change, the composition of these schedules may change, but the method for constructing it will remain same. In other words, it is a dynamic or relative measure.

However, it has some limitations and should therefore be applied, after taking due care of these limitations. These limitations are as follows :-

1. Designing an incentive system in a dynamic environment.

Everytime, any incentive system is to be designed, the AIP Survey Questionnaire will have to accommodate or adjust any other measure that may possibly affect the attitude of the people connected with the industry in question, towards incentives and their expected effect on productivity.

Doing this may necessitate the elimination, addition or alteration of some measures in the 7-rank or 8-rank AIP Scale designed for the present study.

2. Reliability of the measure.

Conversion of weighted average attitudinal scores for any measure to the corresponding percentage gross change in production is dependent on the following two variables:

- a. Nature of the Weighted Average Cumulative Frequency Distribution Curve of all the subsample's distribution of scores in ranks. The possible remedial measure is to draw the said actual curve, each time any incentive system is to be designed.

- b. Weighted Average Predictive Efficiency of the scale. If the negative attitude is not of much importance or necessity, the 7-rank scale will usually give a higher, weighted average predictive efficiency of the scale. Scheduling of the survey questionnaire and group heterogeneity will be other factors in influencing the predictive efficiency of the scale used. Taking the ratio of each item's variance with that of the subgroup's overall mean score has been used as a possible remedial measure.

3. Sensitivity of the comparison between historical and predicted data.

Comparison of predicted data with historical data is very sensitive; a slight change in the basis of deductions/calculations of changes in production may change the results appreciably. The coefficient of correlation has therefore been taken as another possible check and indicator.

Sources from which the historical data has been gathered are varying both in nature as well as uniformity. In some cases, data on particular mill has been taken as the basis of comparison, e.g. source 56, mentioned in Bibliography and Reference (pp 187).

In spite of all these serious limitations, it is inferred from the results of comparison that data from the two sources agree to a reliable extent, though extreme care has to be taken in deciding the equivalence of various measures of the AIP scale with those yielding the historical data.

4. Cumulative nature or additivity of the quantitative assessment or the predicted contributions.

All similar selected measures have been clustered together and the highest predicted contribution made by any one measure of the group has been taken as the maximum that may be yielded by all the measures of the group in question: at this point the assessment was not

cumulative. For example, all sorts of trainings as measures have been taken to yeild the highest benefit predicted to be yeilding from one of the members of that group.

Whereas, contribution due to an entirely unrelated measure has been taken as an additional separate benefit; there, this contribution has been added with that of the previous group. For example, net contribution predicted to be made by the training group of measures has been taken or thought to be additive with that by preventive maintenance or BMR or clean environment or promotion etc. It is very difficult to imagine as to why it should not be so.

5. Concurrence with important previous studies in the line.

Very close concurrence has been obtained for measures suggested by the present study with many of those made earlier. Habibullah, M., Begum, Hamida Akhtar, --- Norton's Report --- all had suggested one or more of those measures in their respective studies, excepting that none of the earlier studies did indicate any rank of the measures, in the construction of any incentive system. Current invigorated effort by the Bangladesh Jute Mills Corporation in collaboration with the world Bank and UNIDO, on training and BMR, further proves the practicability of the present study.

Having described the methodology followed for the study and the analysis of the data, we are now ready to present the result of our data analysis. This has been done in the next chapter, wherein are presented, (i) The Production Preference Schedule of Incentives and the Benefit Preference Schedule of Incentives (ii) The construction and details of these two schedules, and (iii) Causes of Labour problems and better labour-management relations.

CHAPTER - 4

COLLECTION AND ANALYSIS OF DATA

(Pages 55-67)

C H A P T E R - 4COLLECTION AND ANALYSIS OF DATA.

Data has been collected according to the sampling described in the previous chapter on Methodology, discussion and limitation of study.

The whole sample has been divided into 11 sub-samples:

1. Managers of the Jute Industry in General.
2. A Special category of Managers, namely, Export Managers from the Jute Industry.
3. A group of managers from the nationalized industries in general ----- to widen the coverage of the ~~industry~~ ^{study}, to the nationalized industries as a whole.
4. The same group has been used for Test-Retest purpose within an interval of 1 month.
5. Two separate groups of supervisors from each of the three regions, namely, Dacca, Chittagong and Khulna.
6. One group of workers from the Crescent Jute Mills of the Khulna region, for reasons mentioned in the earlier chapter on Methodology, discussion and limitation (pages, 41 - 42).
7. One group of workers from the Adamjee Jute Mills of Dacca region and one group of workers from the Chittagong region in general. These two groups have been taken to-gether to form one subsample. Thus, the total number of subsamples stood as under:

Managers	= 3 subsamples
Supervisors	= 6 subsamples
Workers	= 2 subsamples.

Variance of the average algebraic score of each item and of each subject of any one subsample have been calculated and tabulated vertically and horizontally respective by (pages 116-119). The variance of the average score of all the subjects of any subsample for all the items of the scale (i.e. the Questionnaire used) has been designated as s_o^2 .

Similarly, the variance of the average score of all the subjects for any one item of the Questionnaire has been designated as s_i^2 .

Ratio $\frac{s_i^2}{s_o^2}$ for each item has been designated as F_{i-o} . This

has been calculated for each of items of the AIP Questionnaire, for all the subsamples. Then, the ratio of the maximum value of this F_{i-o} and the minimum value of this F_{i-o} for any item from amongst any of the subsamples taken together, has been designated as $M(\text{observed})$. $M = (F_{i-o})_{\text{max.}} / (F_{i-o})_{\text{Min.}}$ values have been noted for all the items of the AIP Questionnaire used (pages 159-163).

The corresponding maximum-F values for the degrees of freedom and the number of subsamples used in the study, has been designated as $M(\text{critical})$ and has been taken as the critical value for comparison with the values of $M(\text{observed})$.

SUMMARY OF ANALYSIS OF DATA

In analysis of data, attitude of workers, supervisors and managers have been synchronized by noting the insignificance of difference in their weighted average attitudinal scores for the various incentive/production-raising measures, mentioned in the AIP 8-rank survey questionnaire. This synchronization has been done by applying the following criteria: $M(\text{observed})$ is less than $M(\text{critical})$.

(59)

T A B L E - 12a

Incentive Measures unanimously selected by all the three levels (S) and measures not selected unanimously, by all the three levels (NS). Criteria of selection: M(observed) is less than M(critical).

From Hartley's Maximum F-ratio Tables,

$$\text{Value of } M_{\text{critical}} = \frac{F_{\text{max}}}{F_{\text{min}}} = \frac{(s_o^2 / s_i^2)_{\text{max}}}{(s_o^2 / s_i^2)_{\text{min}}} = \frac{4.49 \text{ for d.f.} = 20 \text{ and } K-1}{2.95 \text{ for d.f.} = 20 \text{ and } K-3} = 1.00 \text{ for d.f.} = 60 \text{ or more}$$

Sl.No.	Item of the AIP Scale used.	Description of the Measure.	Values of M's (observed)			S	NS	Weighted Average Score, $\bar{X}_x$	Remarks
			Managers	Super-Visors	Workers All levels together.				
1	a	If the wage/salary of workers is increased by 50%	1.79	2.15	8.47	4.73	NS	3.57	
2	b	If workers are trained in their own job.	1.58	1.17	13.23	11.31	NS	4.55	
3	c	If workers are given more facilities like housing, medical rationing, transport, cropping Expenses Allowance, etc.	3.78	5.34	13.23	2.54	S	4.37	
4	d	If workers are given more cash benefits such as bonuses etc.	3.07	1.29	11.53	8.94	NS	3.61	
5	e	If all management staff are given good management/supervisory training.	2.34	1.57	2.70	1.39	S	4.81	

Difference will be insignificant and hence, attitudes of various levels of people will get synchronized, if the value of M (observed) is less than the value of M (critical), where,

$$M = \text{Ratio} \frac{F_{\max.}}{F_{\min.}} = \text{Ratio} \frac{(s_0^2 / s_1^2)_{\max.}}{(s_1^2 / s_2^2)_{\min.}}$$

and s_0^2 = Variance of the Over-all subsample mean score.

s_1^2 = Variance of the mean score of the subjects of the sub-sample for any incentive item.

This synchronization process resulted in the selection of some incentive measures and the rejection of some incentive measures, under the present organizational environment of the industry. The result may be summarized as under :

(60)

T A B L E - 12 (a)

Sl.No.	Item in the AIP Scale used.	Description of the measure.	Values of M(observed)			Selection		Weighted Average Score, $\bar{X}_w$	Remarks.
			Managers	Super-Visors	Workers	All levels together	S	NS	
6	f	If all management staff are given more technical training relating to their own fields	1.38	2.38	2.70	1.39	S	-	4.82
7	g	If all management people behave well with people working under them.	2.33	2.70		2.64	S		4.25
8	h	If good works are praised and appreciated by supervisors/Incharges/managers/corporation.	1.73	2.36	11.88	6.87		NS	4.54
9	i	If regular maintenance of machineries are done.	1.60	2.35	6.00	3.75	S	-	4.89
10	j	If the working place is kept cleaner and cooler.	1.60	4.02		2.51	S		4.08
11	k	If workers are asked to set their own production target.	2.64	1.74	9.06	5.21		NS	3.41
12	l	If the Department Heads are allowed to set the production target of his own department.	3.87	2.48	10.53	4.25	S	-	4.00

(63)
TABLE - 12 (a)

Sl.No.	Item in the AIP Scale used.	Description of the measure.	M (Observed values for				Selection		Weighted Average Score, $\bar{X}_w$	Remarks
			Managers.	Supervisors.	Workers	All levels together	S	MS		
26	v ²	If workers/sardars are represented in the meeting held by management at all levels, and are allowed to give their opinions in decision-making.	5.79	2.09	11.53	5.52	-	MS	4.10	
27	w	If better quality raw jute is supplied to the machines.	2.94	1.66	4.47	2.69	S	-	5.21	
28	x	If the mill management is given full autonomy in purchasing production, selling, employment, promotion, discharge and profit sharing.	5.99	1.37	11.35	8.28	-	MS	4.47	
29	y	If production control and quality is in all mills at all times, properly.	2.45	1.49	11.35	7.62	-	MS	4.24	
30	z	If workers are required to work only 6 hours a shift.	4.00	3.17		1.29	S	-	3.30	
31	z ¹	If workers are paid piece rate or volume rate (abolishing time rate)	2.29	3.30	16.24	7.09	-	MS	4.72	
32	z ²	If total yearly leave is reduced by 20 days	1.34	1.58	infinite	infinite	-	MS	2.12	
33	z ³	If children allowance upto a maximum of 5 children is given to people working in the jute mills.	2.86	3.96	6.00	2.19	S	-	3.64	

(60)

TABLE - 12 (a)

Sl.No.	Item in the AIP Scale used.	Description of the measure.	Values of M (observed)			All levels together	Selection	Weighted Average Score, $\bar{X}_w$	Remarks.
			Managers	Super-Visors	Workers		S	NS	
6	f	If all management staff are given more technical training relating to their own fields	1.38	2.38	2.70	1.39	S	-	4.82
7	g	If all management people behave well with people working under them.	2.33	2.70		2.64	S		4.25
8	h	If good works are praised and appreciated by supervisors/Incharges/managers/corporation.	1.73	2.36	11.88	6.87		NS	4.54
9	i	If regular maintenance of machineries are done.	1.60	2.35	6.00	3.75	S	-	4.89
10	j	If the working place is kept cleaner and cooler.	1.60	4.02		2.51	S		4.08
11	k	If workers are asked to set their own production target.	2.64	1.74	9.06	5.21		NS	3.41
12	l	If the Department Heads are allowed to set the production target of his own department.	3.87	2.48	10.53	4.25	S	-	4.00

(61)

TABLE - 12(a)

Sl.No.	Item in the AIP Scale used.	Description of the measure.	Values of M (Observed)				Selection		Weighted Average Score $\bar{X}_x$	Remarks
			Managers	Supervisors.	Workers	All levels together	N	NS		
13	m	If the mill management is asked to set its own production target.	4.69	1.35	11.35	8.28	-	NS	4.12	
14	n	If efficient and experienced workers or employees have chance for promotion, to any higher post, upto the post of General Manager.	3.34	4.30	6.88	2.06	S	-	4.72	
15	o	If cost-of-living comes down to the pre-liberation level.	3.65	4.30	6.88	3.58	S	-	4.69	
16	p	If workers are paid a bonus of 50% of their extra-production made.	3.39	1.79	8.88	4.96	-	NS	4.80	
17	p ¹	If all the members of any department are given a bonus of 50% of the extra-production made by the department.	3.30	1.82	14.6	8.05	-	NS	4.49	
18	p ²	If all the employees and workers of the mill are given a bonus of 50% of the extra-production made by the mill	2.26	1.15	10.24	8.90	-	NS	4.93	

(62)

T A B L E - 12 (a)

Sl.No.	Item in the AIP Scale used.	Description of the measure.	Values of M (observed)				Selection		Weighted Average Score, $\bar{X}_w$	Re-marks.
			Managers.	Super-visors	Workers	All levels together	S	NS		
19	q	If the supervisors spend all his working time, by the side of the workers, to supervise him.	4.01	2.22	21.71	9.78	-	NS	3.99	
20	r	If labour-union/political parties do not create pressure on workers and management.	3.34	1.73	13.94	8.09	-	NS	4.01	
21	s	If all superiors give clear job instruction and helping hand to all subordinates/employees/workers.	3.31	1.91	2.35	1.73	S	-	4.65	
22	t	If willful absence for reasons other than medical (i.e. absenteeism) may be minimized.	4.48	2.80	5.53	1.89	S	-	3.57	
23	u	If new machines replace old machines requiring overhauling/repairs at least once in every three months.	5.85	3.23	7.88	2.44	S	-	4.77	
24	v	If all jute mills are de-nationalized.	1.91	2.23	38.8	20.31	-	NS	4.35	
25	v ¹	If only management becomes more efficient.	5.67	1.53	8.76	5.73	-	NS	4.24	

Sl.No.	Item in the AIP Scale used.	Description of the measure.	M (observed values for				Selection		Weigh- ted Average Score, $\bar{X}_w$	Remarks
			Mana- gers.	Super- visors.	Workers	All levels together	S	NS		
26	v ²	If workers/sardars are represented in the meeting held by management at all levels, and are allowed to give their opinions in decision-making.	5.79	2.09	11.53	5.52	-	NS	4.10	
27	w	If better quality raw jute is supplied to the machines.	2.94	1.66	4.47	2.69	S	-	5.21	
28	x	If the mill management is given full autonomy in purchasing production, selling, employment, promotion, discharge and profit sharing.	5.99	1.37	11.35	8.28	-	NS	4.47	
29	y	If production control and quality is in all mills at all times, properly.	2.45	1.49	11.35	7.62	-	NS	4.24	
30	z	If workers are required to work only 6 hours a shift.	4.00	3.17		1.29	S	-	3.30	
31	z ¹	If workers are paid piece rate or volume rate (abolishing time rate)	2.29	3.30	16.24	7.09	-	NS	4.72	
32	z ²	If total yearly leave is reduced by 20 days	1.34	1.58	infinite	infinite		NS	2.12	
33	z ³	If children allowance upto a maximum of 5 children is given to people working in the jute mills.	2.86	3.96	6.00	2.19	S	-	3.64	

CHAPTER - 5.RESULTS OF ANALYSIS

The 8-rank AIP Survey Questionnaire used in the study has 33 items. Of these item x^2 (Reduction of total yearly leave by 20 days) has been used as a check for the normality of workers sample, expecting that a normal worker will never tick/choose beyond the 3rd rank of his choice for this measure.

However, analysis of data resulted in the classification of the 33 items of the Questionnaire, into 2 groups :

1) Items or measures selected by applying the criteria of the M (observed) values less than the M critical value for d.f. (degrees of freedom) = 20 and K (number of sub-samples) = 11. This gives us the Preference Schedule of Incentives in order of decreases in production predicted.

This Order of ranks has changed when we calculated the actual, net annual benefit (cost-benefit analysis) accruing from these predicted changes in production.

2) Items or measures not selected by the applied criteria of M values (observed) greater than the critical value of $M = (F/F)$ for $df = 20$, $K = 11$ (Hartley's maximum F-ratio values). These are the measures on which much difference of opinion exists intra-echelon wise and inter-echelonwise. Arranged in order of ranks of decreasing values of the difference of the two M 's (M observed and M critical), we get a rank schedule of measures that, with all probability, will not be accepted by the managers, supervisors and workers alike. These are the most likely areas of labour problems and unhealthy labour-management relations.

This selection and rejection of measures or items are valid for the present environmental conditions (specially, 1977-1980 conditions) of the environment of the jute industry of Bangladesh.

This selection or rejection may or may not remain the same, when the environmental conditions of the jute industry change.

Group I. Selected Measures of Incentives.

Criteria of selection: M observed is less than M ,

$$\text{Critical; } M = \text{Ratio } \frac{F_{\text{maximum}} (s_o^2 / s_i^2)}{F_{\text{minimum}} (s_o^2 / s_i^2) \text{ min.}}$$

(For d.f. = 20) $M = 4.49$ [Taking the values of Hartley's
& $k = 11$

Maximum F ratio values 7

Table 30 below shows two Preference Schedules:

- (i) Production Preference Schedule of Incentives, indicating the ranks of the selected measures, in the descending order of their contribution to the predicted change in production.
- (ii) Benefit Schedule of Incentives, indicating the ranks of the selected measures in the descending order of the net annual benefits estimated to be accruing from those measures.

The ranks of the measures of the Production Preference Schedule have been shown on the left-hand side and of the Benefit Schedule have been shown on the right-hand side of the table (page 67).

Fifteen of the 33 measures have been selected by all the groups viz. managers, supervisors and workers. Of these measures 3, have the values of their weighted average attitudinal scores, less than 4, and have therefore been dropped from the list. These three measures are :

- (i) item (1) : Reduction of absenteeism to zero.
- (ii) item (2) : Reduction of working hours, and
- (iii) item (3) : Giving Children Allowance upto five children.

Two of the selected measures have been taken as one, because, their effects are not cumulative. Moreover, their individual weighted average scores are almost equal (4.82 and 4.81). These two measures are:

(i) item (e) : Good, management and supervisory training.

(if) item (f) : Technical Training for managers.

We may now have our choice in designing the most acceptable incentive system, under the conditions of the environment of the jute industry, either in terms of expected increases in the total production or in terms of increases in the net annual benefit or in terms of socio-political desirability. We may apply one, or more than one, or all of these selected measures at any one time.

RESULTS OF ANALYSIS.CONSTRUCTION OF PRODUCTION AND BENEFIT
PREFERENCE SCHEDULES OF INCENTIVES.RANKING OF INCENTIVES ACCORDING TO PRE-
DICTED CHANGES IN PRODUCTION AND NET
ANNUAL BENEFIT.

Sl.No. & Production rank.	Item of the 8-rank AIP Scale.	Description of the Measure with predicted change in production; margin of error = $\pm$ 5%	Net Annual Benefit Rank.
1	w	Production will increase by 20%, if better quality raw jute is supplied to the machine.	- 1
2	i	Production will increase by 18%, if regular maintenance of machineries are done.	6
3	e & f	Production will increase by 17%, if all management staff are given good, management/supervisory and technical training in their own field.	1
4	u	Production will increase by 16.5% if new machines replace old machines requiring overhauling/repairs, at least once in every three months.	8
5	n	Production will increase by 16% if efficient and experience workers/employees have chance for promotion to any higher post, up to the General Manager.	2

Sl.No. & Production rank.	Item of the 8-rank AIP Scale.	Description of the Measures.	Net Annual Benefit Rank.
6	o	Production will increase 16% if cost of living comes down to the pre-liberation level.	10
7	s	Production will increase by 15% if all supervisors give clear job instruction and a helping hand to all subordinate employees/workers.	3
8	c	Production will increase by 13.5% if workers are given more facilities like housing, medical, rationing, transport and cropping expense compensation etc.	9
9	g	Production will increase by 12.5% if all management staff behave well with people working under them.	5
10	j	Production will increase by 11.5% if the working place is kept cleaner and cooler.	4
11	l	Production will increase by 10.5% if the department heads are allowed to set their own production target.	7

Group 2: Measures not selected as incentives:

Areas of labour-problems and unhealthy labour-management relations.

Criteria of rejection: $M(\text{observed})$ values greater than $M(\text{critical})$ values.

For d.f. = 20, and $K = 11$, $M(\text{critical})$
 = 4.49 [From Hartleys maximum F-ratio Tables]

Table 31 below presents those measures that has not been selected by the managers, supervisors and workers, unanimously. These have been arranged in the decreasing order the difference between the values of the two M's; these differences indicate the degree of inter-echelon incongruence in regard to those measures. Lack of inter-echelon and intra-echelon communication and ignorance might have been the cause of incongruence in these areas. This also is valid for the present organisational environment of the jute industry (1978-1980 conditions). If the existing incongruence may be removed or minimized, some of these measure, may again be unanimously selected by all echelons of the industry, as the preferred incentive measures; labour problems may be solved and labour-management relations may be made smooth.

These measures, presented in the decreasing order of difference between the two M's [$M(\text{observed}) - M(\text{critical})$] are as follows:

T A L E - 31.

Measures not selected unanimously; Areas of Labour-problems & bitter labour-management relations; areas suffering from the ill-effects of communication-gap.

Sl.No. & Rank of Perceived, inter-eche-lon incongru-ence.	Item of the Survey Questionnaire used.	Description of the Measure.	M=(F/F) observed	M= (F/F) critical d.f. = 20, K=11
1	v.	Denationalization of of the jute industry.	20.31	4.49
2	b.	Proper Training of workers in their own job.	11.31	
3	q	Close supervision by supervisors.	9.71	
4	d	Cash benefits(bonus, etc. to workers.	8.94	
5	p ²	Distribution of 50% of extra production as bonus to the employees and workers of the mill.	8.90	
6	x	Full autonomy to Mill Management.	8.28	
7	r	Removal of union and political pressure.	8.06	
8	p ¹	Distribution as bonus, 50% of the extra-pro-duction given by any department, to the members of the department only.	8.05	

Sl.No. & Rank of Perceived Incongru- ence.	Item of the AIP Ques.	Description of the Measure	M _{observed}	M _{critical} d.f. = 20 K = 3
9	y	Proper production and Qua- lity control in all mills, at all times.	7.62	4.49
10	z ¹	Abolishing time-rate and installing price-rate or volume-rate, everywhere in the industry.	7.09	
11	h	Praises/Appreciation of workers/subordinates, by supervisors.	16.87	
12	v ¹	Increasing efficiency of the management.	5.06	
13	K	Production target set by workers.	5.21	
14	p	Paying 50% of the extra- production, as bonus to workers only.	4.96	
15	m	Production target set by mill management.	4.88	
16	a	Raising the wages/salary of workers by 50%	4.73	

CAUSES OF LABOUR-PROBLEMS AND
BITTER LABOUR MANAGEMENT RELATIONS.

From the Severity Rank Table presented earlier, we can get a clear understanding of the causes of labour problems and bitter labour management relations. Bitter labour-management relations and wild labour problems originate from the existing/prevaling inter-echelon incongruence in certain philosophies, principles and practices of organisational management, their intensity increasing with the extent of incongruence in the connected areas e.g., AIP Scale item (a), (d), (p), (p₁), (p₂) and (p₃). M (F/F) values for these items are 4.73, 8.94, 4.96, 8.05, 8.90, and 7.09 respectively.

Of these, items (d) has the most incongruence, and (a) has the least.

In other words, there is no uniformity of ideas/understanding among workers, supervisors and managers, regarding the possible impact of this measure in raising the production of the industry, in general. As a result, application of this measure for increasing the over-all productivity of the industry may have maximum passive attitude from the workers, supervisors or managers. Similar items/measures having the value of M (observed) greater than the value of M (critical) have been presented below in Table 24, to show their extent of incongruence.

Thus, the most incongruence exists in regard to the denationalization. Managers, supervisors and workers have different understandings of the implications of nationalization of the jute industry and hence, show a sharp difference in their attitudes towards denationalization as a means to increase the overall productivity of the industry.

Next comes item b, i.e. training of workers in their respective fields, as a measure to increase the total production. Every group seem to have a different idea about its impact in raising total production.

Table above presents the areas of inter-echelon incongruence, in the decreasing order of severity.

In conclusion, it may be said that smooth labour-management relations may be maintained and labour problems may be minimized in the jute industry of Bangladesh by removing the inter-echelon incongruence in the above mentioned areas of management of the industry.

Having presented the result of analysis, in this chapter, we shall now try to summarise and conclude the findings of the present study. This has been done in the next chapter. It presents the hypotheses with which the present study started, the theses derived from the present study, a general theory on the design of an incentive system for the jute industry of Bangladesh, and for its nationalized industries, in general, and the sub-hypotheses derived from this study for the future workers.

All calculations, tables and charts have been presented in the Appendix.

RESULTS OF COMPARISON OF THE PREDICTED DATA WITH THE HISTORICAL ONES, AVAILABLE.

Testing the reliability of the
predicted changes in production
due to the AIP Survey Questionnaire.

.....

For the purpose of verification of the reliability of the predictions made in the study, the selected measures will have to be installed in the jute industry and the actual changes in the overall production of the industry may then be observed after one or two or even 3 years.

This is practically impossible for any research worker, unless the jute industry agrees to apply the findings of the study ---- which again is not a feasible propositions.

The next best alternative that is available in our hand is to collect historical data on same, similar and/or equivalent measures as has been used in the AIP Survey Questionnaire and then to find out the significance of difference between the two sets of results compared statistically.

Accordingly, for testing the reliability of the predicted changes in production due to various measures, suggested in the AIP Questionnaire used for the present study, similar, same or equivalent historical data has been collected from various sources, for the purpose of comparison. Such historical results could be obtained for 10 such measures ----- selected or not selected. Thus % difference of the mean of these two sets (predicted and historical) has been calculated. This was found the 4.6% when the margin of error for this study while calculating the required sample size, had been set at 5%.

As similar and/or equivalent items has been used for the comparison, Coefficient of Correlation has also been calculated for these same two sets of data; this was found to be 0.95 when the critical value of the coefficient for $\alpha = 0.05$ and degrees of freedom = 8 (Rank Correlation) is 0.63.

Thus, both the tests namely, the percentage difference of the two means, and the Spearman's Rank correlation coefficient of the two sets, prove beyond any doubt, the reliability of the predicted values.

The following table gives the measures compared their corresponding historical measures, source of historical data, % difference of the means calculated and the Rank Coefficient of Correlation, etc.

The details are in the appendix (pp 162 - 168 and pp 111 - 116).

(75)
TABLE - 32

Sl.No	Description of the Measure	Source of historical data, (Reference number of the bibliography).	Page No. of this reported,	Change in production reported,	Corresponding item in the Questionnaire used for the present study	Change in production predicted	Spearman's Rank Correlation Co-efficient $r_s = 0.05, d.f. = 8$
1.	Mechanical trouble, maintenance problem and shortage of spares.	47 (page-xxiii) page - 30		19.0	(i)	18.00	0.95
2.	Shortage of spares, weaver and yarn.	47 (page-xxiii) 56		11.2	(y)+(b)	11.90	Critical.
3.	Other reasons (external factors) (electric failure, cost of living, union/political pressure) denationalization.	47 (pp-xxiii & xxxvi)		10.41	$\frac{(0)+(x)+(y)}{3}$	12.82	Value of $r_r = 0.63$
4.	Absenteeism	15 (pp-2)		5.60	(t)	8.0	
5.	Cash Benefit/Attendance Bonus.	30		11.48	(d)	11.97	
6.	Production and Quality Control (Total production loss.)	33 (pp-xxiii)		14.93	(y)	15.96	
7.	Transfer of managers	29		56.89	$\frac{(v)+(v^1)}{(r)} + \frac{(v^2)}{(x)}$	59.56	
8.	Yarn Breakage	56 47 (pp-30)		15	(w)	15	
9.	Doffing/Training of workers in their own job.	56		9.5	(b)	7.5	
10.	Replacement of old machine (taking it as 5% of GR)	47		15.5	(u)	16.5	
				169.58		177.36	

SUMMARY AND CONCLUSION.

I N T R O D U C T I O N:

The nationalized industries of Bangladesh has now reached a stage where they are consuming a huge subsidy in one form or another---- thereby compelling the nation to bear a heavy social overhead that miserably fails to justify its worth on any ground.

Whether denationalization is the answer ----- whether monetary benefits such as bonuses of various forms are the right type of incentives ----- cannot be said with confidence; as a result, an eye of disbelief and loss of confidence is pervasive and has resulted in uncomfortable labour-management relations, with frequent labour-unrest in the industrial sector. The result was a sharp decrease in the labour productivity and the productive efficiency of the industries.

A necessity has therefore been felt to probe into the possibility of developing a mechanism for framing a clear and defined policy on incentives, productivity and the labour-management relations for the nationalized industries in general and for the jute industries in particular, under the prevalent organisational environment of the industries.

A study has been made for a period of about 4 years, extending from end '77 to mid '80, in an attempt to develop a methodology for designing a dynamic system of incentives, with prediction of its possible outcome before it is actually installed.

The method used for the study consists of the following steps:

- (1) Developing a battery of attitudes toward various incentives/production-raising measures that are relevant under the present organisational environment of the industry.
- (2) Developing an 8-rank, unidirectional scale to measure the attitude-battery of managers, supervisors and workers of the Jute Industry.

CHAPTER - 6.

SUMMARY AND CONCLUSION (Page 76-92)

THESES, THEORY AND SUB-HYPOTHESES
RESULTING FROM THE STUDY.

(77)

(3) Applying the statistical technique of Variance Analysis for measuring the degree of indifference of various echelons (managers, supervisors and workers) toward any particular incentive or production-raising measure.

(4) Defining a selector M equal to the ratio of ratios of variances,

$$M = \frac{(F_{i-o})_{\max} (s_i^2 / s_o^2)_{\max}}{(F_{i-o})_{\min} (s_i^2 / s_o^2)_{\min}}$$

s_i^2 = Variance of individual item's mean score.

s_o^2 = Variance of sample's mean score and then

taking the value of this **M equal to** , those of Hartley's F-maximum ratios under identical conditions of the confidence criteria and the degrees of freedom, the over-all attitudes of all levels of people working in the industry viz. managers, supervisors and the workers, have been synchronized; incentives/production-raising measures having the value of M (defined above) less than the value of F-critical, has been taken to be selected by all levels of people working in the industry in question.

(5) The study has been made on 11(eleven) subsamples with sizes around 20; one of these subsamples was composed of the managers from the various nationalized industries. This generalized the study and made it applicable to all the nationalized industries of Bangladesh. This sub-sample has been tested for the insignificance of difference from the sub-sample of managers from the jute industry alone.

(6) A cost-benefit analysis ^{has} been done for the jute products at the market rate (weighted average) of Tk. 8342 per ton , a selling cost = 5% of the sales price and the materials

()

cost = Tk. 5000/00 per ton. A benefit schedule of incentives/measures has thus been constructed for the jute Industry with predicted Net Annual Benefit. These measures, according to the present study, are found to be the most desired ones under the present organisational environment of the industry.

(7) Values of M exceeding the critical value of F -maximum, have been taken as the degree of incongruence prevailing among the various echelons of people working in the industry and this gave the areas where labour problems are wild and where bitter labour-management relations do exist.

(8) For the nationalized industries in general, the present study thus provides us with a general theory which, with the required modifications, may therefore be applied for developing the Final Schedule of Incentives/Mea. ; that will be the most desired ones, by all levels of people in the industry in question, at the then prevalent organisational environment of the industry.

HYPOTHESES :

The study started with the following hypothesis :

- (i) The best incentives are those that keep the various levels of people in the industry equally satisfied; these incentives will be indicated by the synchronized attitudes of managers, supervisors and workers ---- inter-firm and inter-regional.
- (ii) The attitudes of managers, supervisors and workers may vary in their preference towards various incentives, but there will be some incentives for which all these levels will show a similar positive or negative attitude ---- varying only in the degree. The Preference Schedule for which all these 3 levels show their indifference is determined by the ratio of the variances of

(79)

their mean attitudinal scores in ranks, for these incentives. Conversion of the mean attitudinal score in ranks into their centile values will determine the expected increase in the total production, due to the incentive in question.

(iii) The insignificance of difference of the average attitudinal scores/ranks, for a defined confidence level, will bring out the incentives that will equally motivate people of all levels, i.e. managers, supervisors and workers.

(iv) Corresponding to the desired level of confidence, significance and accuracy, a selector, M

$$= \frac{F_i \text{ max}}{F_i \text{ min}} = \frac{(s_i^2 / s_o^2) \text{ max}}{(s_i^2 / s_o^2) \text{ min.}}$$

will ~~select~~ ^{select} the incentives,

that will give indifference of satisfaction to all levels of people covered by the attitude survey.

Here, s_i^2 = Variance of the item's mean score

s_o^2 = Variance of the mean score of the sample (any level).

(v) The type of incentives that will result in the highest possible increase in productivity in any industry, at any given period of time, will depend on the organisational environment of that industry at that period.

(vi) The extent to which people working in any industry will get motivated will be determined by the over-all attitude of the people towards various incentives and the productivity, the attitudes being formed by the interaction of the prevailing environment.

(vii) A change in the environment of the industry will bring some change, though slow, in the attitude of the people towards the desired incentives.

A GENERAL THEORY ON INCENTIVES, PRODUCTIVITY
LABOUR PROBLEMS AND LABOUR-MANAGEMENT RELA-
TIONS IN THE NATIONALIZED INDUSTRIES OF
BANGLADESH.

The study resulted in the following general theory on incentives, productivity, labour problems and labour-management relations of the nationalized industries of Bangladesh in general and the jute industry in particular:

Direct monetary incentives will not always work as the most effective and efficient form of incentive for raising the over-all productivity of the jute industry of Bangladesh in particular and the nationalized industries of Bangladesh in general.

The most effective form of incentives will be those that are unanimously selected by the workers, the supervisors and the management; the synchronized weighted average attitudinal score will determine the magnitude of the increase in the total production, due to application of any particular incentive.

(F_{i-o}) max

A Selector, termed as M and defined as $M = \frac{(\mathbf{F}_{i-o}) \text{ max}}{(\mathbf{F}_{i-o}) \text{ min.}}$ and with critical values equal to those of Hartley's maximum F-ratio, selects, under the prevalent organisational environment of the industry in question, those incentives/measures, for which the population in general and workers, supervisors and managers in particular are equally interested.

Such selected measures will form the Preference Schedule of Incentives/Measures which after their cost-benefit analysis, will show their relative suitability or the order of preference for application/implementation at that time.

Bitter labour-management relations and wild labour problems originate from the existing/prevaling, inter-echelon incongruence in certain philosophies, principles and practices of organisational management; their intensity increasing with the extent of incongruence in the connected areas.

THESES RESULTING FROM THE STUDY.A. INCENTIVES/MEASURES FOR RAISING
PRODUCTIVITY OF THE JUTE INDUSTRY

In order to turn the jute industry of Bangladesh into a profitable entity under its present* organisational environment ---- while retaining its nationalized character and in order to sustain that profitability, the industry has, at its disposal, the following incentives or productivity-raising measures which can be immediately and seriously applied/installed in order of priority from nos. 1 to 10 described with the predicted, effective change in the total production and the net benefit that may be obtained therefrom :

1. By arranging effective, tailor-made management, supervisory and technical training for all managers, supervisors and operators working in the jute mills, the industry under its present organisational environment, can produce an extra amount of 85,000 tons/year. and derive a net annual benefit of Tk. 19.85 crores or more.
2. By adopting the policy of giving spontaneous, impartial and judicious promotion to any worker/employee upto any level within the industry, it can produce an extra amount of 80,000 ton/yr. and earn therefrom, a net annual benefit of Tk. 18.50 crores or more.
3. By ensuring that every superior leaves and gives, clear job instruction for people working under and accountable to him, the industry can fetch a net annual benefit of Tk. 16.93 crores or more from an extra-production of 75,000 tons/yr. This will call for a strong training programme and preparation of operational manuals for all levels of operators, supervisors, managers and the directors.

* conditions existing during the period of the study, viz., 1978-1980.

4. By making all the working places of workers in all the mills cleaner and cooler, by incurring an average expenditure of Tk. 10,00,000 (Taka Ten Lakhs) for each of the 77 mills, distributed over a span of 10 years, the industry can get an extra-production of 57,500 tons/year, and earn a net benefit of Tk. 16.08 crores per year or more.
5. By ensuring good behaviour from all superiors to all subordinates, the industry can get an extra-production of 62,500 tons/year and thereby, get a net benefit of Tk. 13.28 crores/yr. or more. This will call for a strong selection and promotion mechanism with a heavy stress on the behavioral aspect of the process of management.
6. By installing preventive maintenance system in all the jute mills, the jute industry can get an extra-production of 90,000 tons/yr. and thereby earn a net annual benefit of Tk. 11.56 crores.
7. By allowing the Departmental Heads to take decisions at their level in regards to the production target, the industry can get an extra-production of 52,500 tons/year and thereby, earn a net annual benefit of Tk. 10.25 crores or more. This will call for judicious and tough selection of supervisors, departmental heads and managers, and a thorough training programme for people in the supervisory positions, with a heavy stress in decision-making processes.
8. By replacing the old and deteriorated machineries of the mills (this measure has been taken as 50% of the whole BMR Programme) the mills can get an extra-production of 82,500 tons/yr. and thus earn a net annual benefit of Tk. 6.00 crores or more.
9. The maximum amount that the industry can afford to spend, under the present organisational environment, for housing facilities, should not exceed the price of two tons of jute goods for each worker per year; in such

a case, the industry will get an extra-production of 67,500 tons/year and earn a net revenue of Tk. 20.00 crores per year, which amount is just sufficient to bear the annual cost of housing the workers (the cost of housing being spread over 20 years).

There will be no net economic benefit but there will be a great social and political benefit in that case.

10. The maximum amount that the industry can afford to spend in the form of a cost-of-living allowance for each worker per year (a direct monetary incentive) should not exceed the sales price of 1 ton of jute goods; in such a case, the industry will get an extra-production of 80,000 tons/year that will fetch up a net revenue of Tk. 23.40 crores, which amount, adequately reduced by a safety margin, may be spent as cost-of-living allowance to workers.

There will be no net economic benefit, but there will be some social and much of socio-political benefit in that.

B. LABOUR PROBLEMS AND LABOUR-MANAGEMENT RELATIONS.

B. 1.

Smooth labour-management relations may be maintained and labour problems may be minimized in jute industry of Bangladesh by removing the inter-echelon incongruences in the areas of management of the industry mentioned below in decreasing order of their severity;

- (1) Denationalization of the jute industry (v)*
- (2) Proper training of workers in their own jobs (b)*
- (3) Close supervision by supervisors (c)*
- (4) Cash benefits (bonuses etc.) to workers (d)*
- (5) Distribution of 50% of extra-production as bonus to the employees and workers of the mill (p)*.

* Item v of the AIP Scale used in the study

- (6) Full autonomy to mill-management (x)*
- (7) Removal of union and political pressure of workers and management (r)*
- (8) Distribution as bonus, 50% of extra production given by any deptt. to the members of the deptt. only (p_1).
- (9) Proper production and quality control in all mills at all times (y)*.
- (10) Abolishing time-rate and installing piece-rate or volume-rate everywhere in the industry (s_1)*
- (11) Praise/appreciation of workers/subordinates by superiors(h).
- (12) Increasing efficiency of the management (v_1)
- (13) Production target set by workers (k)
- (14) Paying 50% of extra-production to workers only (p)
- (15) Production target set by mill management (m)
- (16) Raising the wages/salary of workers(only) by 50% (d)

B. 2 (Example of Interpretation)

Thus, the most incongruence exists in regard to the nationalization/denationalization. Workers, supervisors and managers have different understandings of the implications of nationalisation of the jute industry and hence, show a sharp difference in their attitudes towards denationalization as a means to increase the over-all production of the industry.

SUB-HYPOTHESES

The present study indicates/identifies some other areas where further research needs may be carried out and valuable insights may be obtained in various other aspects of the jute industry and its administration.

These have been presented as sub-hypotheses of the present study and are as follows :

*Item x of the AIP Scale, etc.

A. Determinants of attitudes towards Incentives and Productivity.

In any given condition of the environment, the over-all attitude of anyone working in the industry, towards incentives and productivity, will be formed by a combined impact of his salary/wage, number of subordinates and his hierarchy.

Corresponding to each hierarchy, there is a limit of salary/wage (including the money value of any incentive given) and number of subordinates - close to which the attitudinal score approaches a maximum value. This then defines the maximum value of any salary, wage or incentive expressed in monetary terms, for any manager, supervisor or worker, in the prevalent environmental conditions of the jute industry of Bangladesh.

Of the fringe benefits, bonuses, specially the yearly bonus, has a greater influencing effect in shaping the over-all attitude of people working in the industry, towards incentives and productivity.

Examples from the present study (Details on page 173 and 174)

- A- 1 It may be of no use to raise the total salary of the Chairman of the Bangladesh Jute Mills Corporation by more than Tk. 5,000/- a month.
- A- 2 The minimum salary (monetary benefits) to a worker or to anybody having $H = 1$ (last grade) and no subordinate ($S = 1$) should be at least Tk. 400/= when he will not be interested in (or will be immune) to any type of incentive and the increase in productivity.

B. Impact of the span of supervision on labour-productivity. (Details on page 185)

A disproportionate distribution of worker-officer ratio worker-non-clerk ratio/worker-non-worker ratio is an important determinant of

the difference in the labour-productivity and production efficiency of the zones.

C. Impact of the quality of raw jute on productivity.

Corresponding to the prevalent market rate of jute and jute goods in the domestic and international markets, there will be a particular batch composition that will give maximum profit/minimum loss to the industry. That particular batch composition will have to be experimentally determined for various raw jute prices and the prices of the jute goods in the markets. Too good a quality of the raw jute may bring a loss to the industry.

METHODOLOGY AND DISCUSSION.

A. Recourse to attitude survey method.

The present study took its recourse to Attitude Survey method, because if recourse would not be taken to attitude survey, the only alternative would be to go by historical data.

While the history of the jute industry will give the results of measures that failed to make the industry profitable, any attempt to extrapolate those results for diametrically opposite results, may well bring the industry to a total doom. It has therefore been felt that extrapolation of past data should be avoided as far as practicable.

As the next best alternative, the choice fell on the attitude survey method mainly on 2 considerations ---- (i) incentives, the perceived agents capable to satisfy the needs/wants of the subject, are very to change from time to time, depending on man's attitude towards them, and (ii) a better bargaining is possible, if the proper incentives, suitable for any particular people, time and place, are known beforehand, by studying the prevalent attitudes of the affected.

B. Determination of the sample size.

To determine the actual sample size required for the study, a questionnaire, termed as AIP (Attitude towards Incentives and Productivity) has been designed in consultation with Dr. A.G. Lank (Centre for Education in Int'l Management, Geneva), Dr. J.J. O'Connell (Centre for Education in Int'l Management, Geneva), Dr. V.G.E. Powell, the then Chief Technical Adviser, Bangladesh National Management Development Programme, Prof. V.L. Thomas, ILO-UNDP Expert on Training Methodology, Dr. I. A. H. Ascar, UNIDO Expert to the BJMC, Dr. Hamida Akhtar Begum, Deptt. of Psychology Dacca University and Dr. M. Habibullah of Dacca University.

A test-run was made with this AIP 7-rank questionnaire, on a sample of supervisors coming from the jute Mills in the Chittagong Zone. This has been termed as sub-sample, CS-1. Its size was 18. There are 30 questions in this questionnaire (attached in the appendix).

The scores of all the subjects for all the questions have been tabulated; items mean score (vertically arranged) and subjects mean score (horizontally arranged) were calculated. The mean of all the subjects' mean scores has been taken as the samples mean (or over-all score)

Variance of each items mean score, s_1^2 and the samples mean score s_0^2 have been calculated and their ratio gave F_{1-0} for any particular item.

The actual sample size has there been calculated from the formula,

$$\frac{n_1}{n_2} = \frac{\left(\frac{t_1 s_1}{d_1} \right)^2}{\left(\frac{t_2 s_2}{d_2} \right)^2} = \left(\frac{d_2}{d_1} \right)^2$$

$$\text{taking, } s_1 = s_2 = \sqrt{\quad}$$

$$\text{and } t_1 = t_2 = t$$

Where,

s_1 = standard deviation of the overall mean score of the test-run subsample (CS-1)

σ = standard deviation of the population

n_1 = sample size of the test-run subsample

n_2 = Sample size required for the study.

The actual sample size, used in the study was 15% higher than the calculated, required sample size. This took into account any non-response etc. in sampling. Final sampling was carried out with the modified AIP, 8-rank scale.

C. Calculation of the values of the Selector, M.

A master-table was prepared with all the items mean scores, their variances, the subsamples mean scores and their variances (pp 129)

M has then been calculated by taking the maximum and the minimum values of the variances of each of the items/measures of the AIP Questionnaire (8-rank), from all the 11 sub-samples. Their ratio $\left(\frac{F_{i-o}}{F_{i-o}} \right)_{\text{min.}}^{\text{max.}}$ gave the value of the selector M.

These values have been compared with these of Hartleys maximum F-Ratios for a confidence level of 95% ($\alpha = 0.05$) and degrees of freedom = 20, when $F = 4.49$.

Items/Measures having M-value smaller than 4.49 have been taken to be selected by all levels of people of the industry (i.e. workers, supervisors and managers).

The ratio F_{i-o} took the peculiarities of the subsamples (group variation or level variation or sub-sample characteristics) in to consideration.

(89)

The ratio $M = \frac{(F_{i-o})_{\max.}}{(F_{i-o})_{\min.}}$ registered the indifference of (and thus synchronized) the attitudes of all levels/echelons towards various incentives/measures used in the AIP, 8-rank Questionnaire or scale.

D. Conversion of mean attitudinal scores into percentiles.

The weighted average mean score $\bar{X}_x$ for items selected by M, have been calculated as

$$\bar{X}_x = \frac{(\bar{X}_1 n_1) + (\bar{X}_2 n_2) + \dots}{n_1 + n_2 + \dots}$$

The cumulative Frequency Distribution Curves for 2 subsamples, CS-1 (the test-run subsamples) and DS-1 (another subsample) have been drawn with ranks as abscissa and their cumulative percentile value as ordinate.

The mean of these two curves has been taken as the final, conversion curve. Percentage corresponding to the weighted average mean score ($\bar{X}_x$) of the selected items have been taken as the gross change in production due to that measure

E. Conversion of predicted Gross% change in Production

(P)_g into net % change in production, (p)_r

Split-half test was performed for all the 11 sub-samples and this coefficient of correlation, r , calculated. This gave the predictive efficiency, e , of the a AIP - 8-rank scale used for each subsample. From these, the weighted average Predictive Efficiency, E was calculated as

$$E = \frac{e_1 n_1 + e_2 n_2 + \dots}{n_1 + n_2 + \dots}$$

The gross % change, (p)_g has then been multiplied by the weighted average Predictive Efficiency of the AIP scale, which was 28.5%. This gave the predicted, net % change in production due to the items/measures selected by the Selector M, used for the study.

(89)

The ratio $M = \frac{(F_{i-o})_{\max.}}{(F_{i-o})_{\min.}}$ registered the indifference of (and thus synchronized) the attitudes of all levels/echelons towards various incentives/ measures used in the AIP, 8-rank Questionnaire or scale.

D. Conversion of mean attitudinal scores into percentiles.

The weighted average mean score $\bar{X}_x$ for items selected by M, have been calculated as

$$\bar{X}_x = \frac{(\bar{X}_1 n_1) + (\bar{X}_2 n_2) + \dots}{n_1 + n_2 + \dots}$$

The cumulative Frequency Distribution Curves for 2 subsamples, CS-1 (the test-run subsamples) and DS-1 (another subsample) have been drawn with ranks as abscissa and their cumulative percentile value as ordinate.

The mean of these two curves has been taken as the final, conversion curve. Percentage corresponding to the weighted average mean score ($\bar{X}_x$) of the selected items have been taken as the gross change in production due to that measure

E. Conversion of predicted Gross% change in Production

(P)_g into net % change in production, (p)_r

Split-half test was performed for all the 11 sub-samples and this coefficient of correlation, r , calculated. This gave the predictive efficiency, e , of the a AIP - 8-rank scale used for each subsample. From these, the weighted average Predictive Efficiency, E was calculated as

$$E = \frac{e_1 n_1 + e_2 n_2 + \dots}{n_1 + n_2 + \dots}$$

The gross % change, (p)_g has then been multiplied by the weighted average Predictive Efficiency of the AIP scale, which was 28.5%. This gave the predicted, net % change in production due to the items/measures selected by the Selector M, used for the study.

F. Reliability of the prediction of changes in production.

Predicted, net % change in production, $(p)_n$ due to some of items/measures (selected or not selected) have been compared with changes in production due to some, similar or equivalent items or measures or attributes or causes. These have been gathered from various sources ----- newspapers, periodicals, research papers etc. The % difference for 10 such items, between the predicted and the historical data was 4.6%.

As a check, Spearman's Rank correlation coefficient r , has been calculated for the predicted and the historical set of available data; the r value was 0.95 and $n^{1/2} = 8$).

G. Reliability of conversion mean attitudinal, scores into their corresponding % change.

The values of net % changes in production, as attained by multiplying % change by the weighted average predictive efficiency of the AIP scale, has been checked for their reliability, by measuring the values using another formula with sub-samples DS-1 & KW.

$$p_n = (p_g) \times C_a \times (1 - C), \text{ where}$$

$$r_a = \text{Coefficient of attribute.}$$

$$= \sqrt{\frac{x_1^2 + x_2^2}{N_1 + N_2}}$$

$$C = \text{Contingency Coefficient.}$$

$$\text{and } x^2 = \sqrt{\frac{x_1^2 + x_2^2}{n_1 + n_2 + x_1^2 + x_2^2}}$$

$$= \frac{|f_o - p_1|}{N} = \frac{|R_i - R_o|}{N}$$

[Approximation.]

(91)

f_o = Observed frequency

f_i = Expected frequency

R_i = Subjects, attitudinal score for the item in rank.

R_o = Subjects mean (overall) attitudinal score for all items of the questionnaire.

12 items have been compared and % difference was 0.4. The coefficient of correlation between these 12 pair was 0.81 [critical value of $r = .57$, for $n^1 = 10$, $\alpha = 0.05$.]

H. Construction of the Final Preference Schedule of Incentives.

The items/measures selected by M, have been ranked in order of the magnitude of net annual benefit that may be derived from their application.

This order/rank is, by no means, static; it may change from time to time, depending on the following factors:

1. Prices of raw jute and jute products.
2. Attitudes of workers, supervisors and managers of the industry; if the attitudes of any one group/level/echelon, changes, the whole schedule or its ranking or both may (and most probably, will) change. It is thus, a dynamic schedule and will have to be checked from time to time.
3. The criteria of constructing the schedule. If the net annual benefit is not taken as the sole criteria, it may change drastically.

However, the present study provides the mechanism/methodology to construct it as demanded by the time or the type of the industry.

I. Conclusion :

The present study was carried out to develop a methodology that will be able to offer a policy making tool to the management of the jute industry in particular and of the nationalized industries in general.

It is hoped that the methodology developed and theory originated therefrom will provide the management and the policy-makers, with a highly dependable, policy-framing and bargaining tool; it shows the right approach, in direction atleast, for maintaining a smooth labour-management relations and for minimizing wild labour problems ---- so suicidal for the economy and the nation.

CALCULATIONS AND TABLES.

	<u>Pages</u>
<u>APPENDIX - A</u> :	
1. Tables and calculations relating to Chapter one.	93 - 115
2. Tabulation of test data; Test of content validity, the reliability, the predictive efficiency of the scale and the randomness of the sampling; Determination of the sample size and the sampling plan.	116 - 128
3. Variance Analysis for the mean attitudinal scores made by subjects in each and all the sub-samples.	129 - 142
4. Selection of items/measures by using a Selector M with critical values applicable to Hartley's maximum F-Ratio....	129 - 142
5. Conversion of the mean attitudinal scores into their centile values and derivation of the Mean Centile Scale for the mean attitudinal scores.	143
6. Determination of the weighted average predictive efficiency of the scale.....	145
7. Conversion of the mean attitudinal scores into their corresponding percentage changes in production.	146
8. Checking the validity of the method of conversion of the attitudinal scores into percentage change in production: Comparison between predicted data and historical data: Counter-checking by another method.....	147 160-168
9. Cost Benefit Analysis for measures selected	148 - 159
10. Derivations and calculations for framing the sub-hypotheses.	169 - 184
<u>APPENDIX - B</u> :	
List of references and Bibliography,....	185 - 189
<u>APPENDIX - C</u> :	
The AIP Survey Questionnaires(7-rank and 8-rank).	190 - 201
<u>APPENDIX - D</u> :	
Bio-data of the present research-worker....	202 - 211

(93)

TABLE - 1

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTH AND WEAKNESS.

	1	2	3
Year	Total Foreign Exchange Earnings, Million.	Foreign Exchange Earned by Jute Products, Million Tk. Current/at 72-73 price.	Foreign Exchange by Jute Products . million \$
	(f) +	(f) +	a, f +

1964-65

65-66

66-67

90.6

67-68

128.6

68-69

141.9

69-70

162.2

70-71

140.2

71-72

72-73

2768.5

177

174.7

73-74

2983.3

1585

155.3

74-75

3135.8

1856/1626

200.6

75-76

5551.7

2773/1434

175.2

76-77

6670.1

275/1396

162.2

77-78

7178.2

3610/1700

236.5

78-79

9725.1

4322

79-80

+ references, mentioned on page 100

ঢাকা বিশ্ববিদ্যালয় প্রকল্প

সংরক্ষণ সংখ্যা... A 209366

(96)

T A B E - 1 (contd.)

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTH AND WEAKNESS.

Year	12 Interest paid Tk./Ton.	13 Cost of material Tk./Ton.	14 Total cost per ton Tk./Ton.	15 Selling price Tk./Ton.
	(c) *	(c)*	(c) *	(c)*, (g)
1964-65				
65-66				
66-67				
67-68				
68-69				
69-70				
70-71				
71-72				
72-73	345	1,780	4,194	3,392
73-74	285	1,811	4,318	3,712
74-75	462	2,646	5,706	5,003
75-76	581	3,102	6,477	5,392
76-77	623	3,536	7,066	5,924
77-78	623	4,373	7,880	6,778
78-79				8,341 g*
79-80				11,555 g

a, b, c ... These are the references as mentioned on page .100

(93)

TABLE - 1

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTH AND WEAKNESS.

Year	1 Total Foreign Exchange Earn- ings, Million. (f) +	2 Foreign Exchange Earned by Jute Products, million Tk. Current/at 72-73 price. (f) +	3 Foreign Exchange by Jute Products million \$ a, f +
1964-65			
65-66			
66-67			90.6
67-68			128.8
68-69			141.9
69-70			162.2
70-71			140.2
71-72			
72-73	2768.5	117	174.7
73-74	2983.3	1585	155.3
74-75	3135.8	1856/1626	200.6
75-76	5551.7	2773/1434	175.2
76-77	6670.1	215/1396	162.2
77-78	7178.2	3610/1700	236.5
78-79	9725.1	4322	
79-80			

+ references, mentioned on page 100

ঢাকা বিশ্ববিদ্যালয় প্রকল্প

সংরক্ষণ সংখ্যা... A.209366

T A B L E - 1 (contd.)

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTH AND WEAKNESS.

Year	4 FOB Price of Jute Products Exported \$/ton	5 Qty. of Jute Pro- ducts Ex- ported, Long tons (000)	6 JPE $\times$ 100 TE (2) $\div$ (1) / Balance of Trade Tk. Crores.	7 Jute good produced, long tons (000)
	(a) +	(d) +	(f) +	(b), (a) +
1964-65		222		289
65-66		316		409
66-67	361	347		464
67-68	300	422		509
68-69	314	452		507
69-70	327	496		560
70-71	372	377		440
71-72	-	238	* 0	315
72-73	441	418	52.26/-102	446
73-74	448	436	53.00/-434	500
74-75	545	368	59.00/-771	444
75-76	385	455	50.00/-915	478
76-77	352	461	41. 6/-732	490
77-78	454	522	51.84/-1101	546
78-79		459	44.44/-1095	501
79-80		525		580

+ References mentioned on page 100

* Values of $\frac{\text{Jute Products Export (JPE)}}{\text{Total Export (TE)} \times 100}$

0 Balance of Trade in those years.

(95)

T A B L E - 1 (contd.)

THE JUTE INDUSTRY OF BANGLADESH: ITES STRENGTH AND WEAKNESS.

	8	9	10	11
Year	Total Employ- ment Nos. (000)	Raw Jute consumed (000) Bales/ (000) Tons.	Cost of Labour Tk./Ton.	Cost of overhead Tk. /Ton.
	(a) *	(b) *	(c) *	(c) *
1964-65		1703/		
65-66		2382/		
66-67	85	2365/		
67-68	105	3001/		
68-69	120	3028/		
69-70	131	3422/		
70-71	131	2739/		
71-72	-	1850		
72-73	134	2627	907	1,163
73-74	171	2941/	1072	1,150
74-75	151	2546/	1,083	1,115
75-76	153	2719/	1,016	1,778
76-77	154	2890/	1,133	1,774
77-78	177			

* references mentioned on page 100

(96)

T A B E - 1(contd.)

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTH AND WEAKNESS.

Year	12 Interest paid Tk./Ton.	1 Cost of material Tk./Ton.	14 Total cost per ton Tk./Ton.	15 Selling price Tk./Ton.
	(c) *	(c)*	(c) *	(c)*, (g)
1964-65				
65-66				
66-67				
67-68				
68-69				
69-70				
70-71				
71-72				
72-73	345	1,780	4,194	3,392
73-74	285	1,811	4,318	3,712
74-75	462	2,646	5,706	5,003
75-76	581	3,102	6,477	5,392
76-77	623	3,536	7,066	5,924
77-78	623	4,373	7,880	6,778
78-79				8,341 g*
79-80				11,555 g

a, b, c ... These are the references as mentioned on page .100

(. .)

T A B L E - 1 (contd.)

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTHS AND WEAKNESS.

	16	17	18	19	20
Year	Looms Installed	Looms Operating	Production per op. loom per year, Tons loom/yr.	Annual Wage per man . \$	Tk. per \$
	(b) *	(b)*	(a)*		
1964-65	11,363	10,007	28.88		
65-66	12,630	11,800	34.66		
66-67	14,603	13,073	30.90	306/	5.46
67-68	18,051	16,060	31.69	333/	4.76
68-69	20,573	18,358	27.62	333/	4.76
69-70	21,453	20,631	27.14	473/	4.76
70-71	23,781	18,137	24.26	473/	4.76
71-72	23,836	15,188	-	-	4.76
72-73	23,702	20,004	22.30	346/	7.80
73-74	23,700	19,441	25.72	486/	7.80
74-75	23,798	18,036	24.62	435/	8.90
75-76	23,413	19,839	24.09	269/	15.04
76-77	23,385	20,190	24.29	306/	16.50
77-78	23,669	21,319	25.61		15.50
78-79	24,360	22,559	22.21	-	-
79-80	-	-	-	-	-

* These are the references mentioned on page 100

TABLE 1 (contd.)

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTH AND WEAKNESS.

Year	21	2	23
	Labour Productivity (7) ÷ (8)	Production per Taka Wage, Tons/ Yr./Tk, wage.	Production Raw jute Tons of Product per ton of Raw Jute.
	<u>Tons</u> Man-yr		
1964-65		7.31	.9
65-66		6.85	.96
66-67	5.46	5.97	.96
67-68	4.85	4.25	.95
68-69	4.23	3.34	.94
69-70	4.27	-	.92
70-71	3.36	2.76	.90
71-72	-	.72	.96
72-73	3.33	1.01	.95
73-74	2.92	1.58	.95
74-75	2.94	.50	.98
75-76	3.12	1.35	.99
76-77	3.18		.95

THE JUTE INDUSTRY OF BANGLADESH: ITS STRENGTHS AND WEAKNESS.

Year	24 Total Min. Loss with- out Subsidy +deprecia- tion + P&L balance, million.	25 Loss without subsidy (Tk./Ton.	26 S u b s i d i e s, Tk. Ton Bonus Vou- chers Tk/ Ton exper- ted.	27 Cash or Nominal Tk/Ton.	28 Gross Tk/ Ton.	29 Total	30 Loss with sub- sidy Tk./ Ton.
	(a)	(c)/(d)	(a)	(d)	(d)	(d)	(d)
1966-67	70.37		876.00				
67-68	91.17		926.5				
68-69	103.57		957.5				
69-70	115.67		975.80				
70-71	121.56		1339.5				
71-72							
72-73	49.56	873/846	-	80	-	80	766
73-74	49.46	860/786	-	133.85	340.15	474	312
74-75	22.61	815/1166	-	564.75	-	564.75	602
75-76	32.38	825/1107	-	461.42	412.19	873.61	234
76-77	46.18	1104/1478	-	386.59	406.43	793.40	685
77-78	57.41/61.5	1788	-	229.83	406.43	636.43	1151
78-79	64.95	-	-	-	-	-	-

(a), (b) These are the references as mentioned on page 100

(1)

References used in the table.

- a. M. Moinuddin Ahmed. "Public Sector V.S. Private Sector? Jute/Jute Products".
- Paper prepared for BEA/BIDS
Seminar on 2-yr.plan
- on 16.6.78
- b. "Problems of Jute Sector" published, May 1978 - by the PR Deptt., BJMC, Dacca.
- c. "UNIDO-UNDP Project Report, 1st October - 1978.
- d. Dr. M. Habibullah and Others
"A Study of Govt. Subsidy to Jute Industry" (Unpublished)
document of the Govt. of Bangladesh (no 21,23,37,67 & 75).
- e. "Quarterly Summary of Jute Goods Statistics" - Vol.21, July - Sept., 1978 - 79, Bangladesh Jute Mills Corporation, Dacca.
- f. "Economic Trends" - Bangladesh Bank, March 1979 & October, 1979.
- g. "Bangladesh - Selected Economic Indication" Bangladesh Bank, 26 January, 1980.
- h. Assumption/Estimation.
- i. "Md. Moinuddin Khan and others "A study on Jute and Cotton Textiles". January, 1979, Prepared for the Govt. of Bangladesh.

.....

(101)

TABLE - 2.

(5)

*Jute Industry of Bangladesh from 1955-1966)

Tons/Loom/Year and Tons of product/Tons of raw Jute.

Year	Looms opera- ting.	Total Prod. Tons. 000 Tons.	Raw Jute consumed 000 Bales	Tons/Loom/ Year.	(Tons Prod.) (Tons, Raw Jute.)
1955-56	4193	130210	734	24.91	.99
56-57	5227	144550	809	24.13	1.00
57-58	5990	157860	941	26.35	.94
58-59	6886	203440	1209	29.59	.94
59-60	7738	256280	1527	33.12	.94
60-61	7849	248900	1456	31.71	.96
61-62	8120	271080	1590	33.38	.95
62-63	8837	298160	1744	33.74	.96
63-64	9955	330930	1942	33.24	.95
64-65	10007	289110	1703	28.89	.95
65-66	11863	407040	2371	34.31	.96

(5) Ahmed. Rakibuddin, "Progress of the Jute Industry & Trade
(1855 - 1966)" E.P. Jute Board,

1 Bale = 400 lbs.

(Page - 498).

(102)

T A B L E - 3.

Span of Supervision/control in the Jute Mills
Expressed by the

Ratio $\frac{\text{No. of workers, in 35 samples}}{\text{No. of officers}}$

Jute Mills of the BJMC (47)

Sl.No.	No. of workers per officer.	Sl. No.	No. of workers per officer.
1.	27	19.	50
2.	26	20.	41
3.	25	22.	36
4.	23	23.	32
5.	42	24.	32
6.	34	25.	33
7.	69	26.	32
8.	26	27.	30
9.	16	28.	28
11.	33	29.	25
12.	40	30.	29
13.	27	31.	27
14.	54	32.	27
16.	27	33.	37
17.	26	34.	35
18.	43	35.	66
		36.	46
		37.	46
		38.	27

Observation:

It may thus be observed from the organisation structures of the BJMC and its enterprises that the following anomalies are prevalent:

1. There is no uniformity in the distribution of span of control of officers of various mills, varying from 23 to 66.

2. The Organisation structures of different mills vary widely. Head Sardars are usually extremely imbalanced; in the sample structure "A", there are 50 Head Sardars and 100 Sardars under 12 shift Incharges and 110 Supervisors, whereas, in the sample structure "B", there are 6 Head Sardars under 22 shop Floor Supervisors.

(47) Khan Md. Moinuddin et al., "A Study on Jute and Cotton Textiles
Planning, Dacca, Jan. 1979.

(103)

T A B L E - 4.Employment Position of the Industry (1969-1977)
pp XXXIV(a)

a) Officers + employees in H.O., Z.O. & Branch Offices.	914
b) Total Salary + Fringe	105 laks.
c) Total Employment: (76 - 77)	1,98,705 persons.
Salary + Wage + Fringe	Tk. 7176 lakhs,
Permanent workers	74.5% of total workers.
Workers' productivity	58.5% of 69 - 70
Over-all employees' productivity	51% of 69 - 70

Average Salary/Wage/Incentives.

For Head Office (BJMC) and Regional Office

and Directorates -

$$\text{Ave. Salary} = \frac{10500000}{914} = 11,488 \text{ Tk/Man/Year.}$$

For the Jute Industry as a whole,

$$\text{Ave. Salary + Wage etc.} = \frac{7176}{198705} = 3,611 \text{ Tk/Man/Year.}$$

$$\text{Employment Ratio} = \frac{914}{1,98,705} \times 100 = .45\%$$

$$\text{Salary/Wage Ratio} = \frac{105}{7176} \times 100 = 1.46\%$$

$$\frac{\text{Salary per employee}}{\text{Wage per worker.}} = \frac{11,488}{3,611} = 3.18$$

(104)

T A B L E - 4.

Employment Indices (pp - 84)

1969 - 70 = 100

Year	Production Workers	All-employees	Production Index.
1969 - 70	100.00	100.00	-
70 - 71	127.80	128.90	-
71 - 72	103.60	104.50	-
72 - 73	79.20	83.60	80.28
73 - 74	161.60	175.70	90.55
74-75	134.50	150.80	78.60
75 76	149.50	167.60	86.23
76 - 77	149.50	170.80	88.40
77 - 78	158.10	177.90	97.65

(105) (47)

TABLE - 5Working Capital Position.

Tk. Lakhs.					
Year	Current Assets.	Current Liab.	Working Capital.	Loan from banks.	% Current Obligation.
1972 - 73	14,162	17,206	3,044	8,968	52
73 - 74	17,760	19,868	2,108	9,119	46
74 - 75	25,010	26,473	1,463	10,621	40
75 - 76	24,237	24,976	739	9,142	37
76- 77	25,264	35,775	10,511	11,805	33

(106)

TABLE - 6.

Present Organisational Environment of the Jute Industry of Bangladesh; Production/Quality Control - as revealed by the yardage/ton of jute goods produced and exported by Bangladesh and metres/tonnes of jute goods produced by India.

HESSIAN		Year	SACKING	
Bangladesh	India		Bangladesh	India
3619	3277	1965-66	2460	2152
3683	3318	1966-67	2421	2170
3585	3347	1967-68	2419	2171
3600	3377	1968-69	2400	2230
3600	3277	1969-70	2400	2236
3600	3285	1970-71	2400	2168
3600	3270	1971-72	2400	2194
3600	3303	1972-73	2400	2229
3603	3140	1973-74	2394	2216
3600	3316	1974-75	2400	2206
3600	3364	1975-76	2400	2207
3600	3130	1976-77	2400	2280
3930	3133	1977-78	2577	2291
3878	3133	1978-79	2520	2281
3704	-	1979-80	2540	-
Yds./ton	Metres/tonne	(March)	Yds/ton	Metres/tonne.

(107)

From the above table, it may be observed that the constant yardage of 3600 yds/ton as shown to have been maintained from 1968-1976 indicate the sheer absence of proper quality control/production control measures, because, the quality control methods, whenever applied, shows a fluctuation from a Higher Control Limit to a Lower Control Limit. The same is found to be the case for Sacking too. Comparatively **lighter** products are shown to have been supplied since 1976-77 session (3930 yds/ton for Hessian and 2577 yds/ton for Sacking). Whereas, the Indian scene, though showing absence of proper quality control measures since 1975-1976, is found to be supplying comparatively heavier products (3130 metere/ton) for Hessian and lighter products (2280 Met/tonne) for Sacking. It seems, India too, had not been maintaining proper quality control measures from 1971-72 to 1974-1975, specially for Sacking. Incidentally, a lighter product (higher yardage/ton) will require a very high quality of raw jute, if it is to be durable and **dependable**

(108)

TABLE - 7.

Present Organisational Environment
of the Jute Industry of Bangladesh:
Management Information System.

Year	Tons of product ⁵⁰	Average Wastage %
	Tons of raw jute	
1968-69	.94 ^j	8.81
69-70	.92	8.42
70-71	.94	
71-72	.92	
72-73	.95	10.98
73-74	.95	10.77
74-75	.98	10.00
75-76	.98	8.97
76-77	.92	7.95
77-78	.98	7.47

It may thus be observed that there is no agreement ^{between} % conversion and % wastage. The discrepancy may arise mainly due to poor quality and production control system or defective MIS. Management Information System has been reported to be defective and contradictory and hence unreliable (Page 42, i).

$$50j. \text{ For } 1968-69, \frac{\text{Tons of product}}{\text{Tons of raw jute}} = \frac{5,07,323 \times 2240}{30,28,000 \times 400} = .94$$

- c : Annexure - 1 (Problems of Jute Sector" by BJMC)⁽¹⁷⁾
i : Page - 42 ("A study on Jute and Cotton Textiles",⁽⁴⁷⁾
by M.M. Khan, etc.)

1 bale = 400 lbs, 1 ton = 2240 lbs.

Impact of changes in production and
productivity of the Jute Industry on
the financial health of the industry
itself.

Taking the 1977 - 78 figures for the jute products,

100% production	= 546,000 tons
∴ 1% "	= 5,460 tons
	= 5,460 x 6778 Taka
	= 37.0 x million Taka
	= $\frac{37}{15}$ million \$
	= 2.47 million \$
Balance of Trade	= Tk. 11,100 million.
(1977-78)	= 750 million \$

If the above mentioned 1% increase in the total production can be achieved with the existing bill for Labour and O/H, then (from UNIDO Report, 1st Oct, 1978, I.A.H. Ascar) cost per ton will reduce by Tk. 2884 (= 1223 + 1661) and then the total cost per ton will be Tk. 7880 - 2884 = Tk. 4996.

∴ Cost Reduction for 5460 tons (1%) will be equal to 5460 x 2884 = Tk. 15.75 million.

If this 1% increase is possible with the materials cost only, then the cost per ton will reduce by 1223 + 1661 + 623 = Tk. 3507.

In that case,

total reduction in cost of production due to this 1% increase in total production will be = 5460 x 3507 = Tk. 19.15 million.

(112)

- 1) Lack of motivation
- 2) Opportunity for doing agricultural works in own fields, or any other work of higher remuneration.

Loss in Production due to Absenteeism :

- a. Page 39, "Problems of Jute Mills as seen by BJMC".
Output per loom-hr. by a permanent weaver was 21.63 lbs. and that of a badli weaver was 18.58 lbs., so that the loss due to a badli weaver amounts to 3.05 lbs. per loom-hr."

∴ In Physical terms, loss in production due to the engagement of badli workers comes to be $\frac{21.63 - 18.58}{21.63} \times 100 = 14\%$.

- b. "Production Efficiency for the month of March '79" published by the BJMC (Page 2).

No. of permanent workers	=	1,43,031
No. of workers in attendance	=	1,47,003
No. of badli workers employed	=	58,929
No. of temp./casual workers employed.	=	1,195

Total number of workers employed = 2,03,55

It may thus be observed that the loss in production due to badli workers, very well represents the loss in production due to absenteeism.

Again, loss in production by a badli worker is equal 14% of that given by a permanent hand. Using March '79 figures (15) total no. of permanent workers = 1,43,031 and total no. of badli workers = 58,929. Therefore, total loss in production due to badli workers = $(14 \times \frac{58,929}{1,43,031})\%$
= 5.6%

Thus, if absenteeism could be reduced to zero, production would increase by 5.6%.

(109)

Impact of changes in production and
productivity of the Jute Industry on
the financial health of the industry
itself.

Taking the 1977 - 78 figures for the jute products,

100% production	= 546,000 tons
∴ 1% "	= 5,460 tons
	= 5,460 x 6778 Taka
	= 37.0 x million Taka
	= $\frac{37}{15}$ million \$
	= 2.47 million \$
Balance of Trade (1977-78)	= Tk. 11,100 million.
	= 750 million \$

If the above mentioned 1% increase in the total production can be achieved with the existing bill for Labour and O/H, then (from UNIDO Report, Ist Oct, 1978, I.A.H. Ascar) cost per ton will reduce by Tk. 2884 (= 1223 + 1661) and then the total cost per ton will be Tk. 7880 - 2884 = Tk. 4996.

∴ Cost Reduction for 5460 tons (1%) will be equal to 5460 x 2884 = Tk. 15.75 million.

If this 1% increase is possible with the materials cost only, then the cost per ton will reduce by 1223 + 1661 + 623 = Tk. 3507.

In that case,

total reduction in cost of production due to this 1% increase in total production will be = 5460 x 3507 = Tk. 19.15 million.

Less per ton without subsidy (1977-78) have been calculated by the same report to be = Tk. 1478.

∴ Total loss = $546000 \times 1478 = 807$ million Tk.

∴ The required Increase in the total production for covering this amount of loss (with proportionate increase in the material cost only) = $\frac{807}{19.15} = 42.14\%$. This increase, if possible would bring the loss to zero.

Of course, if the over-all productivity increases by 1% (i.e. if $546000 \times 1.01 = 551,460$ tons can be produced with the total, present cost of 546000 tons) then $5460 \times 7880 =$ Tk. 43 million would be available to reduce the total loss. In that case, an increase of $\frac{807}{43} = 19\%$ in the over-all productivity would bring the industry to a point of no loss, no subsidy - which is yet a dream since 1951).

From above, it is seen that for 1% increase in the labour productivity only, the over-all productivity changes from

$$\frac{6778}{7880} = 0.86 \text{ to}$$

$$\frac{6778}{(7880 - 1223)} = 1.02.$$

$$\text{The net change is} = \frac{1.02 - 0.86}{.86} \times 100 = 18.60\%$$

(in the market rate of 1977 - 78).

(111)

PRESENT ORGANISATIONAL ENVIRONMENT
OF THE JUTE INDUSTRY : ABSENTEEISM

In March 1979.

Total No. of workers present = 1,47,003

Badli workers used = 58,929

∴ Total No. of permanent workers present = 88,074

Total No. of permanent workers on roll = 1,43,031

Total No. of permanent workers actually present. = 88,074

∴ Permanent workers remaining absent = 54,957

$$= \frac{54,957}{1,43,031} \times 100 \%$$

$$= 38\%$$

Assuming entitled leaves to be availed of, excepting the medical leave which is on half-average pay, the total number of days for which a permanent worker may try to go on leave with pay, is equal to :

15	(Casual Leave)			
+ 10	(Declared Public Holiday)			
+ 16	(Earned Leave, @ 1 day for 22 days)			
+ 51	(Weekly holiday)			
92 days		$= \frac{92}{365}$	$\times 100 \%$	$= 36 \%$

It may thus be observed that almost all the permanent workers seem to be availing of all the leaves with pay which they are entitled to. This may be due to two reasons.

- 1) Lack of motivation
- 2) Opportunity for doing agricultural works in own fields, or any other work of higher remuneration.

Loss in Production due to Absenteeism :

a. Page 39, "Problems of Jute Mills as seen by BJMC".
Output per loom-hr. by a permanent weaver was 21.63 lbs. and that of a badli weaver was 18.58 lbs., so that the loss due to a badli weaver amounts to 3.05 lbs. per loom-hr."

∴ In Physical terms, loss in production due to the engagement of badli workers comes to be $\frac{21.63 - 18.58}{21.63} \times 100 = 14\%$.

b. "Production Efficiency for the month of March '79" published by the BJMC (Page 2).

No. of permanent workers	=	1,43,031
No. of workers in attendance	=	1,47,003
No. of badli workers employed	=	58,929
No. of temp./casual workers employed.	=	1,195

Total number of workers employed = 2,03,55

It may thus be observed that the loss in production due to badli workers, very well represents the loss in production due to absenteeism.

Again, loss in production by a badli worker is equal 14% of that given by a permanent hand. Using March '79 figures (15) total no. of permanent workers = 1,43,031 and total no. of badli workers = 58,929. Therefore, total loss in production due to badli workers = $(14 \times \frac{58,929}{1,43,031})\%$
= 5.6%

Thus, if absenteeism could be reduced to zero, production would increase by 5.6%.

(113)

INFLUENCE OF INTERNAL ENVIRONMENT OF THE
PRODUCTIVITY OF THE JUTE INDUSTRY: MANAGE-
MENT PHILOSOPHY AND ORGANISATIONAL BEHAV. JR

Change in production due to transfer and suspension of managers, or placement of inexperienced managers. Vide, the Daily Ittefaq dated Sept. 13, 1979: a case on the Adamjee Jute Mills Ltd.

Production of Hessian

In June	-	514 tons	
In July	-	780	} Average = 831.5
In August	-	838	

Change in production before and after transfer etc.

$$= \frac{\frac{831.5 - 514}{2}}{\frac{831.5 + 514}{2}} \times 100\%$$

47.19%

Production of Sacking

In June	-	283 tons.	
In July	-	460	} Average = 508 tons.
In August	-	550	

$$\text{Change due to transfer etc.} = \frac{\frac{508 - 283}{2}}{\frac{508 + 283}{2}} \times 100\%$$

= 56.89 %

And average change in production = 52.8%

(114)

(68)

INFLUENCE OF EXTERNAL ENVIRONMENT ON
THE PRODUCTIVITY OF THE JUTE INDUSTRY
POWER FAILURE

Change in production due to
electrical break downs(vide
the Weekly Begum dated Oct.
28,1979).

Loss in production due to failures in electric supply

= 39000 tons in 1978 - '79.

= $\frac{39000}{501000} \times 100 \%$

= 7.78%

As reported by the Bangladesh Observer, dated 31-10-79, this
loss = 37,568 tons = $\frac{37,568}{501000} \times 100 \%$ = 7.5 %. Thus, if there would
be no power failure, production would increase by 7.6%.

(68)

INFLUENCE OF POLITICAL ENVIRONMENT
ON THE JUTE INDUSTRY: LABOUR UNREST

Change in production due to political/labour
unrest (the Weekly Begum, date Oct.28,1979)

Loss in production due to labour unrest = 21000 tons

= $\frac{21000}{501000} \times 100\%$

= 4.19%

As reported by the Bangladesh Observer, dated 21-10-79 this loss is equal
to 58,568 = 21000 tons.

That is, if there would be no labour unrest, production would increase
by 4.19%.

(115)

INFLUENCE OF INTERNAL ENVIRONMENT OF THE
PRODUCTIVITY OF THE JUTE INDUSTRY:MANAGE-
MENT PHILOSOPHY(MOTIVATION).

Change in Production in 1977-78 as com-
pared to that in 1976-77 due to cash award
incentive device and reduction in the per-
centage of wastage (as claimed by BJMC,
vide, the Bangladesh Observer dated 5.8.78).

Production in 1977-78 - 564,333 tons.

" " 1976-77 - 490,057 "

Increase in Production in 1977-78 = 56,276 tons.

$$= \frac{56,276}{4,90,057} \times 100\%$$

$$= 11.4 \%$$

In other words, in the opinion of BJMC cash incentives
at the present rate, through reduction in wastage, have
increased the total production by 11.5 % during 1977-1978.

(1)

T A B L E - 8.

TABULATION OF ATTITUDINAL SCORES
CHITTAGONG SUPERVISORS-1 (Test Sample)

<u>Items of the AIP Scale.</u>											
	a	b	c	d	e	f	g	h	i	j	k
1	4	4	4	4	4	5	6	6	5	4	4
2	3	4	3	1	4	4	3	3	4	3	2
3	4	5	3	3	6	7	5	3	5	4	4
4	4	5	3	3	6	7	3	3	6	4	3
5	3	4	3	5	4	5	4	5	4	3	2
6	4	5	5	2	5	5	4	5	4	3	5
7	3	4	3	3	5	6	4	5	2	3	6
8	4	4	3	4	4	5	3	4	4	3	1
9	3	2	4	2	4	5	2	3	4	2	2
10	3	4	5	4	5	4	5	7	8	4	5
11	4	4	4	4	5	5	5	5	4	4	1
12	1	4	2	4	4	4	4	4	4	3	3
13	3	4	3	4	4	4	3	4	4	3	4
14	4	3	4	3	4	5	4	4	5	4	2
15	2	3	3	2	1	1	2	3	5	3	2
16	2	4	3	4	4	4	4	3	4	3	2
17	3	5	2	2	5	6	2	5	6	4	4
18	3	4	3	4	4	4	3	5	4	4	4
1	57	72	60	60	58	79	86	66	75	79	61
$\bar{X}$	3.16	4.0	3.33	3.22	4.40	4.80	3.66	4.16	4.40	3.38	3.06
$(\sum x^2)$	12.5	10.0	14.01	18.97	23.03	8.04	27.11	26.58	17.0	6.42	40.07
s^2	.74	.59	.82	1.11	.35	2.24	1.11	1.56	1.0	.38	2.36

TABLE - 8

Items of the AIP Scale.

Scores by respondents.	Items of the AIP Scale.						
	m	n	o	p	p ¹	p ²	q
1	5	6	5	5	6	6	2
4	3	1	3	2	3	4	4
3	5	7	5	6	6	5	6
8	5	7	4	5	6	5	6
8	5	4	5	5	4	5	4
3	5	7	5	5	5	6	4
8	5	6	6	5	6	5	4
5	4	5	5	2	3	4	4
4	2	3	2	4	4	4	3
2	3	5	6	6	5	4	4
2	4	7	4	3	3	3	1
4	3	4	3	4	5	5	4
3	5	4	5	4	5	5	2
5	2	2	2	5	5	3	3
3	2	4	2	2	5	5	1
2	2	4	4	3	3	2	2
3	4	5	4	4	6	4	6
5	5	7	5	4	5	5	1
5	68	71	88	75	78	80	61
3.7	4.0	4.9	4.16	4.20	4.3	4.45	3.4
28.29	23.0	48.99	34.83	33.56	27.54	21.05	61.28
1.66	1.35	2.88	2.05	1.97	1.62	1.24	3.60

TABLE - 8Items of the AIP Scale.

r	s	t	u	v	v ¹	v ²	w
2	5	5	3	4	5	5	6
4	4	4	4	3	4	2	4
4	4	4	3	2	6	4	3
4	4	4	3	2	6	4	3
4	3	5	5	4	4	4	3
5	4	4	5	5	5	3	5
3	3	3	6	5	5	5	4
4	4	1	4	7	3	2	4
3	4	2	5	2	4	2	6
2	5	4	6	7	6	5	4
4	5	3	3	1	4	3	4
3	3	4	4	2	5	2	6
5	3	3	5	2	3	3	3
4	4	3	3	2	5	3	5
1	1	4	2	1	1	6	2
3	4	3	4	4	4	3	4
3	4	4	3	3	5	4	4
5	3	3	5	2	3	3	3
63	68	61	73	59	78	63	74
3.5	3.78	3.39	4.06	3.28	4.33	3.5	4.11
23,25	17,26	14,80	24,46	83,32	33.12	29.5	27.39
1.37	1.02	.87	1.44	4.90	1.9	1.74	1.61

TABLE - 8

x	y	z	$\bar{X}_i$	x_s^2
5	5	5 136	4.53	.44
4	4	4 98	3.27	.36
6	5	6 141	4.70	.69
6	5	6 137	4.57	.49
3	3	3 119	3.97	.01
2	3	2 132	4.4	.28
1	5	5 129	4.3	.18
5	3	1 108	3.6	.07
2	2	4 93	3.1	.59
4	3	5 137	4.57	.49
4	4	4 113	3.77	.01
6	4	3 105	3.5	.14
2	2	4 110	3.67	.04
2	5	4 110	3.67	.04
2	4	6 80	2.67	1.45
4	4	4 101	3.37	.25
4	4	5 122	4.07	.39
2	2	3 118	3.93	.04
64	67	74 116	3.87	5.92
3.56	3.72	4.11		
36.53	19.61	31.78		
2.14	1.15	1.87		

$s^2 = \frac{5.92}{17} = 0.35$
 $s = \sqrt{.35} = .59$
 $\text{cov} = \frac{.59}{3.87} \times 100 = 15.24\%$
 $\text{S.E.} = \frac{t.s}{\sqrt{n}}$
 $.04 = 2.11 \times \frac{.59}{4.24} = .30$
 $5.92 = \dots = 7\%$

(120)

TABLE - 9

TEST OF VALIDITY OF THE AIP SCALE USED IN THE STUDY: Grouping of similar/related/complementary/identical items, on the basis of the predicted increase in productivity by the implementation of the measure.

SUB-SAMPLE - CS-1.

Group of Similar items.	Items of the 7-rank AIP scale	Predicted net increase in production p_n	Rank	Av. p_n %	Std.Dev. of p_n s	Co-eff. of variation COV. (%)
A.	y w i	21 21 18.7	1	20.23	1.71	8.45
B.	o p ² p ¹ z	19.3 19.3 16.0 16.0 14.3	2	17.0	2.92	17.2
C.	g h ₂ v	14.0 13.7 16.0	3	14.9	1.73	11.6
D.	v ¹ v ²	14.6 15.1	4	14.85	0.06	.4
E.	b e f	12.3 14.0 13.0	5	13.1	0.73	5.57
F.	c j	12.1 12.9	6	12.5	.51	4.1
G.	l m x	11.8 10.7 12.7	7	11.63	.73	6.3
H.	q s	11 12	8	11.5	.5	4.3
I.	a d	7.3 6.7	9	7.53	0.94	12.05
J.	k r	5.2 5.5	10	5.35	0.25	.46

INTERPRETATIONS: Since the maximum variation (COV%) is found to be 17.2% (in items/measures of group B above), the AIP Questionnaire is taken to be valid.

The impact of measures of Group B (Bonus) will be the most divergent one.

(121)

T A B L E - 10

TEST OF RELIABILITY OF THE AIP SCALE(7-rank)

SUB-SAMPLE - CS-1

Technique : Split-half method:

1st half.

2nd half.

Items 1 to 15, i.e.

Items 16-30 i.e.

a to o

p - z

Ho : $(\bar{X}_{1st} - \bar{X}_{2nd})$ at $\alpha = 0.05$, is not significant.

$$\frac{t^2}{df} = \frac{2}{15} = 0.133$$

Ist 2nd at $\alpha = 0.05$ is not significant.H₁ : Coefficient of Correlation r is high. and $r \neq 0$

X = item scores for 1st half Y = item scores for 2nd half.

$$\bar{X} = \left(\sum_{i=1}^{15} X_i \right) / 15 = 70$$

$$n^2 = 121$$

$$F = \frac{t^2}{\frac{n-1}{2}} = 2.46; F_c = 2.50$$

X	x=X-X	x ²	XY(xy)	D ²	y ²	y=(Y-Y)	x ₁
51	13	169	87.49	1.11	45.29	6.73	76
72	2	4	11.45	.11	76.21	8.73	78
60	10	100	107.30	1.23	115.13	10.73	80
58	12	144	98.27	.03	68.39	8.27	61
79	9	81	56.43	.79	39.31	6.27	63
86	16	256	20.23	1.00	1.61	1.27	68
66	4	16	13.08	.08	68.39	8.27	61
75	5	25	18.65	.01	11.91	3.73	73
79	9	81	92.23	1.23	105.47	10.27	59
61	9	81	78.57	1.89	76.21	8.73	78
55	15	225	94.05	.22	39.31	6.27	63
68	2	4	9.46	.12	22.37	4.73	74
71	1	1	5.27	.15	27.77	5.27	64
88	18	324	40.86	.36	5.15	2.27	67
75	5	25	23.65	1.0	22.37	4.73	74
1050		1536	784.28	9.36	726.89		1039
		(x ²)	(xy)	D ²	(y ²)		

Pearson's r =

$$\frac{(xy)}{\sqrt{(x^2)(y^2)}}$$

$$\frac{r^2}{r} = \frac{55.4}{17\%} \quad \frac{E}{E} = \frac{33\%}{56\%}$$

$$\text{Spearman's } r_r = 1 - \frac{6 \sum D^2}{7(n^2 - 1)} = 0.83$$

$$\frac{r^2}{r} = \frac{69}{17\%} \quad \frac{E}{E} = \frac{44}{66\%}$$

(12)

TEST FOR THE SIGNIFICANCE OF THE CO-EFFICIENT CORRELATION.

$$H_1 : r \neq 0 \quad t = r \sqrt{\frac{n-2}{1-r^2}} = 0.74 \sqrt{\frac{16}{1-(0.74)^2}} = 0.74$$

$$x \sqrt{\frac{16}{1-0.55}} = 0.74 \times \frac{4}{0.45} = \frac{0.74 \times 4}{.67} = 4.4.$$

$$t_{0.05, 16} = 2.12 \quad \therefore t \neq 0, \text{ and we accept } H_1.$$

Min. value of r :

$$\sqrt{\frac{r}{1-r^2}} = \frac{1.746}{\sqrt{(n-2)}}$$

$$= \frac{1.746}{4} = 0.437 = \text{This is the value for } r = 0.40$$

INTERPRETATION: AND CONCLUSION: THE SCALE IS RELIABLE HAND ITS PREDICTIVE EFFICIENCY IS 33%, AND ITS INTERVALS IS FROM:

$$\left(\frac{7+17}{2}\right)\% \text{ to } \left(\frac{56+66}{2}\right)\% \text{ i.e. from } 12\% \text{ to } 61\%$$

(123)

TABLE - 11 χ^2 - TEST FOR RANDOMNESS OF SAMPLING

Test - Sample : C.S. 1

Ho : Sampling was random

Criteria $\chi^2_{0.05, V} > \chi^2_{cal.}$
or $\chi^2_{cal.} < d. f.$

$$i : 79 - 141 = 63. \quad \frac{63}{3} = 21$$

Interval	f_o	f_e	$f_o - f_e$	$(f_o - f_e - 0.5)^2$
79 - 99	3	6	9	6.25
100 - 120	8	6	4	2.25
121 - 141	7	6	1	.56
			14	9.06
$\therefore \chi^2 = \frac{(f_o - f_e)^2}{f_e} =$			$\frac{14}{6} =$	2.33

With Yates Correction $\chi^2 = 5.99$ Thus, we accept Ho, i.e.Sampling was random.

(124)

INTERVAL ESTIMATES OF THE MEAN OVER-ALL SCORE:
AIP SCALE 1 (7-RANK).

TEST SAMPLE: CS -1

$$t_o = \frac{\bar{x} - \mu}{s / \sqrt{n}} = \frac{\bar{x} - \mu}{s / \sqrt{n}}$$

$$\therefore \bar{x} - \mu = t \cdot \frac{s}{\sqrt{n}} = \text{Std. Error of the mean.}$$

$$\bar{x} = 3.92$$

$$(\sum (x_j - \bar{x})^2) = 5.92$$

$$s_y^2 = \frac{(\sum (x_j - \bar{x})^2)}{n - 1} = \frac{5.92}{17} = .33$$

$$s_y = \sqrt{.33} = 0.57 \quad \therefore \text{COV} = \frac{.57}{3.87} \times 100 = 14.73\%$$

$$(\text{EST}) \text{ SE}_{\bar{y}} = \frac{s}{\sqrt{n}} = \frac{0.57}{\sqrt{18}} = \frac{0.57}{4.24} = 0.13$$

$$\text{for } \alpha = 0.05$$

$$\text{and d.f.} = 17.$$

$$t = 2.11$$

$$\therefore t \times \frac{s}{\sqrt{n}} = 2.11 \times 0.13 = .2743 = 7\%$$

$$\therefore \mu_y = 3.87 \pm 0.27$$

$$\text{i.e., } 3.60 < \mu < 4.14$$

INTERPRETATION: With this scale, the mean over-all score will vary from 3.60 to 4.14 ranks - with a ccc of $\alpha = 0.05$ and an error limit of $\pm 7\%$.

(125)

INTERVAL ESTIMATES OF VARIANCE AND STANDARD
DEVIATION,AND OF THE MEAN OVER-ALL SCORE:
APP SCALE 1 (7-RANK)

$$\chi^2 = \frac{(\sum x^2)}{n} - \frac{(\bar{x} - \bar{y})^2}{n}$$

$$s^2 = \frac{(\bar{x} - \bar{y})^2}{n - 1}$$

$$\text{or } (\bar{x} - \bar{y})^2 = s^2 (n - 1)$$

$$\therefore \chi^2 = \frac{s^2 (n - 1)}{\bar{x}^2}$$

$$\text{for } \alpha = 0.05$$

$$n - 1 = 17$$

$$\chi^2_{0.025} = 7.6$$

$$\chi^2_{0.975} = 30.2$$

$$s^2 = 0.33$$

$$\frac{s^2 (n - 1)}{\chi^2_{0.005}} = \frac{0.33 \times 17}{7.6} = 0.74$$

$$(s = \sqrt{.74} = 0.86)$$

$$\frac{s^2 (n - 1)}{\chi^2_{0.995}} = \frac{0.33 \times 17}{30.2} = .19$$

$$\frac{.19 < \sigma^2 < .74}{.44 < \sigma < .86}$$

INTERPRETATION: With this scale, the variance will change from 0.19 to 0.74 and the standard deviation of the mean will change from 0.44 to 0.86 with a c.c. off = 0.05 and error limit of $\pm 7\%$.

(126)

DIFFERENCE BETWEEN THE TWO SURVEY QUESTIONNAIRE
(7-Rank & 8-Rank).

$$N_1 = 18 \quad N_2 = 20 \quad \therefore \sqrt{\frac{1}{N_1} + \frac{1}{N_2}} = \sqrt{\frac{0.056 + .050}{}} = 1.02$$

$$\sigma(\bar{X}_1 - \bar{X}_2) = \sqrt{\frac{N_1 S_1^2 + N_2 S_2^2}{N_1 + N_2 - 2}}$$

$$= \sqrt{\frac{6.3 + 4.6}{18 + 20 - 2}}$$

$$= \sqrt{\frac{10.9}{36}} = .30 = .55$$

$$t = \frac{\bar{X}_1 - \bar{X}_2}{.55} = \frac{.58}{.55} = \frac{.58}{.55 \times 1.02} = 1.054$$

$$\sigma(\bar{X}_1 - \bar{X}_2) \sqrt{\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}$$

$$t_{(.05, 19)} = 1.761 \quad \therefore t < t_{crit.}$$

(1) $\therefore (\bar{X}_1 - \bar{X}_2)$ is not significant at $\alpha = 0.05$.

$$(2) \therefore F = \frac{(S_1^2) 17}{(S_2^2) 19} = \frac{.35}{.23} = 1.52$$

$$F_{0.05, 17, 19} = 2.18 \quad \therefore (S_1^2 - S_2^2) \text{ is not significant}$$

$$N_1 = 18$$

$$r_1 = 0.57 \quad Z_1 \rightarrow 0.648$$

$$Z_2 - Z_1 = .95 - .65$$

$$\therefore Z = \frac{.300}{.353} = 0.86$$

$$\text{Thus, } Z < Z_{c.05}$$

$$N = 20$$

$$r_2 = 0.74 \quad Z_2 \rightarrow 0.95$$

$$Z_1 - Z_2 = \sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}} = \sqrt{\frac{1}{15} + \frac{1}{17}}$$

$$= 0.213$$

(3) $\therefore (r_2 - r_1)_{0.05}$ is not significant

Conclusion: Thus, we accept H_0 , i.e. the difference between the two AIP Scales is not significant at $\alpha = 0.05$.

(127)

Determination of the actual sample size.

When,

d_1 = Standard error of the mean of sample
with size, n_1

d_2 = Standard error of the mean of sample
with size, n_2

s_1 = Standard deviation of the mean of n_1

s_2 = Standard deviation of the mean of n_2

t_1 = z-equivalent of the sample n_1

t_2 = z-equivalent of the sample n_2

then,

$$d_1 = z_1 \cdot \frac{s_1}{\sqrt{n_1}} \quad \text{or } n_1 = \frac{t_1^2 s_1^2}{d_1^2}$$

$$\therefore d_2 = z_2 \cdot \frac{s_2}{\sqrt{n_2}} \quad \text{or } n_2 = \frac{t_2^2 s_2^2}{d_2^2}$$

$$\therefore \frac{n_1}{n_2} = \frac{\frac{t_1^2 s_1^2}{d_1^2}}{\frac{t_2^2 s_2^2}{d_2^2}} = \frac{t_1^2 s_1^2}{d_1^2} \cdot \frac{d_2^2}{t_2^2 s_2^2}$$

$$= \left(\frac{d_2}{d_1} \right)^2, \text{ if } s_1 = s_2$$

$$\therefore N_2 = \left(\frac{d}{d_2} \right)^2 \times n_1$$

$$t_1 = t_2$$

For the Pilot sample (CS-1) the standard deviation, $s = 0.59$,

$$n_1 = 18, \quad t = 2.11$$

$$\begin{aligned}
 d &= \frac{t_1 \cdot s_1}{\sqrt{n_1}} = \\
 &= \frac{2.11 \times .59}{18} \\
 &= \left(\frac{.3}{3.87} \times 100 \right) \% = 7.5\%
 \end{aligned}$$

For d_2 = Standard error of the mean of the final sample.

$$\begin{aligned}
 \text{then, } n_2 &= \left(\frac{d_1}{d_2} \right)^2 \times n_1 = \left(\frac{7.5}{5} \right)^2 \times 18 \\
 &= 2.25 \times 18 \\
 &= 40
 \end{aligned}$$

Thus, the required sample size for the study = 40.

Of course, if we use the co-efficient of variation of the mean (COV = $\frac{s}{\bar{x}} \times 100$) in place of the standard error of the mean, and limit this variation in the final study, upto a maximum value of 5%, then using equation,

$$\frac{n^2}{n_1} = \left[\frac{(\text{COV.})_1}{(\text{COV.})_2} \right]^2$$

We get the required sample size,

$$\begin{aligned}
 n_2 &= \left[\frac{(\text{COV})_1}{(\text{COV})_2} \right]^2 \times n_1 = \left(\frac{15}{5} \right)^2 \times 18 \\
 &= 9 \times 18 = 162
 \end{aligned}$$

Remark: Our actual sample size in the present study was

18 i.e. 15% higher.

(129)

TABLE - 12.

ANALYSIS OF DATA
VARIANCE ANALYSIS OF ATTITUDINAL SCORES.

1	2	3	4	5	6	7	8	9	10
			M A N A G E R S						
			M-G (21) (S ₁)	E-M (10) (S ₂)	(NI) T	(NI) RT (16) (S ₃) 3.25	(NI-MG)	(F) T-RT.	(P/F) M
Item Parameter.									
a	$\bar{X}$		4.19	3.50	4.38				
ct	s_1^2		1.26	2.27	1.32	1.18	1.92	1.12	1.79
tary	s_o^2		.43	1.92	.49	.72			
ures.			2.93	1.68	2.69	1.63			
	F_{i-o}								
d	$\bar{X}_2$		4.33	3.30	4.	3.44			
	s_i		1.53	2.23	2.24	1.19			
	F_{i-o}		3.56	1.16	4.57	1.65	1.88	1.88	3.07
p	$\bar{X}$		5.09	4.60	5.13	4.13			
	s_i^2		2.39	3.60	1.58	1.18			
	F_{i-o}		5.56	1.88	3.22	1.64	3.05	1.34	3.39

(130)

TABLE - 12 (contd.)

ANALYSIS OF DATA
VARIANCE ANALYSIS OF ATTITUDINAL SCORES.

	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Remarks.
	SUPERVISORS						WORKERS									
	CS-1 (18) (S ₈)	CS-2 (16) (S ₉)	(F/F) CS	DS-1 (20) (S ₆)	DS-2 (22) (S ₇)	(F/F) DS	KS-1 (17) (S ₄)	KS-2 (19) (S ₅)	(F/F) KS	(F/F) S	WCT WDC (S ₁₀)	M= (F/F)	F _{max.}	Wtd. $\bar{X}$	(F) max for K=11 d.f.=20 4.49 but for K=3 d.f.=20 = 2.95	
.16	3.16	3.22		3.15	3.27		3.35	3.74			3.88	4.73	1.35	3.57		
.74	1.32	1.32		1.96	.78		.99	.93			1.44					
.35	.38	.38		.23	.32						0.16					
.11	3.47	3.47	1.64	8.5	2.44	3.48	3.41	2.11	1.62	2.15	8.47					
.22	4.10	4.10		3.85	3.18		3.53	3.68			2.95			3.61		
.11	.77	.77		1.32	.91		1.02	.90			1.96					
.17	2.03	2.03	1.56	5.75	2.84	2.02	3.52	2.05	1.72	1.29	11.53	8.94	2.02			
.20	4.56	4.56		4.55	5.32		4.98	5.00			5.38			4.80		
.97	2.12	2.12	2.28	2.28	2.70		1.86	1.56			1.51					
.63	5.58	5.58	1.01	9.91	8.44	1.17	6.41	3.55	1.81	1.79	8.88	4.96	1.33			

(131)

TABLE -12(contd.)

	2	3	4	5	6	7	8	9	10
			MANAGERS						
P ₁	X	4.71	5.40	4.63	3.32				
	s_i^2	1.99	2.93	1.72	1.43				
	F_{i-o}	4.63	1.53	3.51	1.99				3.07
P ₂	$\bar{X}$	5.57	4.40	5.00	4.06				
	s_i^2	1.56	2.93	1.73	1.13				
	F_{i-o}	3.63	1.53	3.53	1.57				2.31
Z ₁	$\bar{X}$	4.81	4.60	5.06					
	s_i^2	2.26	4.42	2.12					
	F_{i-o}	5.26	2.30	4.33					2.29
	Group	1.90	2.0	1.78	1.27				
	$(F/F)_{max.}$								
	$F_{crit.}$	3.76	7.80	4.68	4.68				
C	$\bar{X}$	4.90	4.50	5.00	3.63				
	s_i^2	1.79	2.94	.67	.80				
	F_{i-o}	4.16	1.53	1.37	1.11				3.75

(132)

(T A B L E - 12 (contd.))

F ₁	11	12	13	14	15	16	17	18	19	20	WORKERS			25
											21	22	23	
SUPERVISORS														
P ₁	4.30	4.63		4.90	4.73		4.76	5.47			4.50			4.49
	1.62	2.92		1.93	3.25		1.89	1.26			2.49			
	4.63	7.68	2.20	8.40	10.16	1.21	6.28	2.86	1.66	1.82	14.6	8.05	1.36	
P ₂	4.45	5.13		5.10	5.50		4.88	5.53			4.57			4.93
	1.24	1.63		1.61	2.36		.86	1.10			1.74			
	3.54	4.29	1.19	7.01	7.38	1.05	2.97	2.50	1.21	1.15	10.24	8.90	1.20	
Z ₁		4.31		4.55	4.59		4.59	5.42			4.52	7.09	1.65	4.72
		3.03	.	.98	2.16		2.01	.76			2.76			
		7.97		4.26	6.75	1.58	6.93	1.79	4.01	3.30	16.24			
Gr. (F/F)														
	2.68	3.90		2.10	4.10		2.38	2.06			1.98			
F _{crit}	4.20	4.68		3.90	3.50		4.80	4.00			3.76			
II	3.33	4.69		3.80	4.64		4.59	4.26			4.71	2.45	8.04	4.37
	.82	1.30		2.62	1.67		.76	.96			2.25			
	2.34	3.42	1.46	11.63	5.22	2.23	2.62	2.1	1.20	3.46	13.23			
Money Measures.														

(134)
TABLE - 12 (contd.)

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SUPERVISORS										WORKERS		Remarks.		
CS-1 (18)	CS-2 (16)	(F/F) CS.	DS-1 (20)	DS-2 (22)	(F/F) DS	KS-1 (17)	KS-2 (19)	(F/F) KS	(F/F) KS	WCT + WDC	M= (F/F) max.	F max.	Wtd. $\bar{X}_x$	(F) max.
3.00	3.75	3.82	3.52	3.42	4.86	1.10	2.19	3.64						
.8	1.46	.70	1.01	1.16	1.10	1.77								
2.86	2.10	6.37	2.19	1.15	3.48	2.64	1.47	3.96	6.00	2.19				
1.62	1.86	2.38	1.28	1.21	2.25									
4.20	4.68	3.90	3.50	4.80	4.00	3.76								
4.00	4.54	4.70	4.82	5.06	5.00	3.95	11.3	4.55						
.59	.20	1.01	1.39	.18	.22	2.25		4.55						
1.69	1.90	1.12	4.6	4.34	1.06	1.61	2.0	1.24	1.17	13.23	13.69			4.4
4.40	4.75	5.20	5.14	5.12	5.00	4.69	2.88	4.81						
1.35	.75	.05	.85	.48	.33	.77	2.48	4.4						
3.86	1.97	1.96	4.6	2.66	1.73	1.66	1.33	1.25	1.57	4.53				
4.80	4.63	4.75	5.18	4.74	4.81	1.39	4.82							
2.24	.94	1.39	1.77	.40	.90	.46								4.4
6.4	2.47	2.59	6.05	5.53	1.09	1.38	1.95	1.4	12.80	2.70	3.41			
3.78	1.30	1.58	2.09	1.20	1.50	4.90								
4.20	4.68	3.90	3.50	4.80	4.00	3.76								

(135)

T A B L E - 12 (contd.)

VARIANCE ANALYSIS OF ATTITUDINAL SCORES.

1	2	3	4	5	6	7	8	9	10
Group	Item	Per- meter	M-G	E-M	(NI) _T	(NI) _{RT}	(F/F) NI-NG	(F/F) T-RT	(F/F) M
V	i ₂	X ₂	5.48	4.20	4.94	3.25			
int.	s _i		1.26	3.96	1.36	1.32			
	F _{i-o}		2.93	2.06	2.78	1.83	1.03		1.60
pair.	u	X	4.67	4.30	4.31	4.63			
	s _i		3.22	3.34	3.43	.92			
	F _{i-o}		7.49	1.74	7.0	1.28	3.73		5.85
	(F/F)max.		2.56	1.18	2.52	1.43			
	F _o		3.76	7.80	4.68	4.68			
w	X		5.14	4.50	5.13	4.44			
	s _i		2.51	3.83	1.42	1.73			
	F _{i-o}		5.87	2.00	2.90	2.40	1.22		2.94
rol	X		4.24	4.60	4.88	3.56			
	s _i		1.98	3.60	2.19	1.88			
	F _{i-o}		4.60	1.88	4.47	2.60	1.16		2.45
max.	F _{crit}		1.28	1.06	1.54	1.09			
	X		3.76	7.80	4.68	4.68			
j	X		3.90	3.90	4.25	3.25			
	s _i		1.39	3.88	1.27	1.40			
	F _{i-o}		3.23	2.02	2.59	1.94	1.10		1.60
g	X		2.86	3.60	2.62	4.25			
itions.	s _i		2.63	2.93	.78	2.93			
	F _{i-o}		6.12	1.53	1.59	4.07	3.85	2.56	4.00

(136)
TABLE - 12(contd.)

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CS-1	CS-2	(F/F) CS	DS-1	DS-2	(F/F) DS	KS-1	KS-2	(F/F) KS	(F/F) S	WORKERS WCT	F/F max.	(F) Max.X	Wtd	(F) MaxC
4.00	4.94		4.70	4.82		5.06	5.00			3.95			4.89	K=17 df=20
1.00	2.05		1.04	1.63		.93	.36			1.02				
2.63	5.39	2.05	4.52	5.09	1.13	5.54	1.22	2.63	2.35	6.00	3.75	1.60		4.49
4.06	4.56		4.60	4.95		5.12	4.09			6.38			4.77	
1.44	2.59		2.04	1.0		.74	1.51			1.34				4.49
4.11	6.82	1.66	8.89	3.13	4.36	2.55	3.43	1.35	3.23	7.88	2.44	1.92		
1.54	1.27		1.72	1.62		1.28	2.41			1.31				
4.20	4.68		3.90	3.50		4.80	4.00			3.76				4.49
4.11	5.44		5.55	5.59		5.18	5.42			6.81			5.21	
1.61	2.02		.79	1.59		1.28	.80			.76				4.49
4.60	5.32	1.16	3.44	4.97	1.44	4.41	1.	2.42	1.66	4.47	2.69	2.80		
4.00	3.72		4.05	4.41		3.76	4.16			5.26			4.24	
1.15	1.87		1.42	1.97		1.32	1.71			1.96				4.49
3.29	4.92	1.49	6.70	6.16	1.08	4.55	3.89	1.17	1.49	3.35	7.62	1.42		
1.40	1.09		1.98	1.04		1.03	2.14			2.48				
4.20	4.68		3.90	3.50		4.80	4.00			3.76				
3.38	4.50		4.10	4.27		4.24	4.16			5.52			4.08	
.38	2.15		1.69	1.82		.82	1.82							
1.09	5.66	5.19	7.35	5.69	1.29	2.83	4.4	1.46	4.02	2.51	3.39		4.49	
4.11	3.25		2.90	3.68		3.82	3.58			1.62			3.30	
1.87	2.47		1.37	3.96		4.53	2.18							4.49
5.34	6.5	1.22	12.71	12.38	1.03	15.69	4.95	3.17	3.17	1.29	4.08			

(137)
TABLE - 12 (contd.)

VARIANCE ANALYSIS OF ATTITUDINAL SCORES.

1	2	3	4	5	6	7	8	9	10	
Group	Item	Para	M-G	EM	(NI) T	(NI) RT	(F/F) NI-MG	(F/F) T-RT	(F/F) M	
z	2	X	2.05	2.40	2.19					
		s _i	.75	2.49	.83					
		F _{i-o}	1.74	1.30	1.69	-	1.03	-	1.34	
		(F/F) max								
			3.52	1.55	1.63					
VII Leadership type on org. behaviour.	g	X ₂	4.38	3.60	4.69	3.69				
		s _i	1.12	2.04	2.40	1.03				
		F _{i-o}	2.60	1.06	4.90	1.43	2.33	3.43	4.62	
		(F/F) max								
VII Leadership style/org. Behaviour.	h	X	4.90	3.80	5.06	3.89				
		s _i	1.29	3.33	1.05	1.98				
		F _{i-o}	3.00	1.73	2.14	2.75	1.40	1.88	1.73	
		(F/F) max								
q	2	X	4.19	4.60	4.38	3.36				
		s _i	2.86	3.18	2.65	1.46				
		F _{i-o}	6.65	1.66	5.41	2.03	3.28	1.82	4.01	
		(F/F) max								
s	2	X ₂	4.67	4.50	4.69	4.06				
		s _i	2.23	4.06	2.50	1.13				
		F _{i-o}	5.19	2.11	5.10	1.57	3.31	2.21	3.31	
		(F/F) max								
v	2	X ₂	4.43	3.00	4.19	3.56				
		s _i	4.16	1.56	2.30	1.20				
		F _{i-o}	9.67	1.23	4.69	1.67	5.79	2.81	5.79	
		(F/F) max								
			3.22	1.72	2.53	1.75				
			(F/F) c							

(138)
TABLE - 12 (contd.)

VARIANCE ANALYSIS OF ATTITUDINAL SCORES.

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SUPERVISORS										WORKERS.				
CS-1	CS-2	(F/F) CS	DS-1	DS-2	(F/F) DS	KS-1	KS-2	(F/F) KS	(F/F) S	WCJ WDC	M=(F/F) max.	F _{Max}	Wtd. X _x	(F/F) max.
	2.50		2.25	2.09		2.47	2.11			1.00			2.12	
	.80		.98	2.16		4.01	1.16			0				4.49
	2.10		4.26	6.75	1.58	3.48	2.64	1.32		0				
4.90	3.10		2.98	2.18		5.54	1.88							
3.68	3.94		4.60	4.68		4.71	4.34			4.43	2.64	3.50	4.25	
1.60	2.52		2.37	1.75		.97	.92			.46				4.49
4.57	6.63	1.45	10.31	1.88	3.34	2.09	1.60	1.30	2.70					
4.16	4.56		5.00	5.00		4.47	5.00			4.05	6.87	1.98	4.54	
1.56	1.41		1.37	.76		1.01	.50			2.02				4.49
4.10	3.18	1.29	5.95	2.38	2.50	3.48	1.14	3.05	2.36	11.88				
3.40	4.31		4.05	4.36		3.35	3.79			3.90	9.78	1.67	3.99	
3.60	1.59		1.69	2.62		1.99	2.28			3.69				
10.29	4.18	2.46	7.35	8.19	1.11	6.86	5.18	1.32	2.22	21.71				
3.78	5.31		4.80	5.18		4.65	5.05			4.50	1.73	4.65		
1.02	1.04		1.00	2.18		.99	.72			.40				
2.91	2.74	1.06	4.35	6.81	1.57	3.41	1.64	2.08	1.91	2.35				
3.50	4.31		4.15	4.82		3.94	3.68			5.52	5.52	1.51	4.10	
1.74	1.00		.86	1.83		3.18	1.52			1.96				
4.97	2.63	1.89	3.76	5.72	1.52	10.97	3.45	3.18	2.09	11.53				
(F/F) max.	3.54	1.59	1.95	3.44		3.21	4.54			9.23				

(139)
TABLE - 12 (contd.)

			3	4	M A N A G E R S			7	8	9	10
Group	Item	Para-meter	M-C	EM	(NI) T	(NI) RT	(F/F) NI-MG	(F/F) T-RT	(F/F) M		
VIII	k	X	4.14	4.10	3.69	2.88					
		² s _i	2.03	3.43	1.30	2.43					
		F _{i-0}	4.72	1.79	2.65	3.38	1.78	1.87	2.64		
l	X	X	4.33	4.10	4.00	2.94					
		² s _i	1.70	1.88	1.87	1.26					
		F _{i-0}	3.95	1.02	3.82	1.75	2.26	1.48	3.87		
m	X	X	4.76	4.30	4.13	3.13					
		² s _i	2.16	1.79	.78	1.18					
		F _{i-0}	5.02	1.07	1.5	1.64	3.16	1.51	4.69		
x	X	X	4.19	5.00	4.88	4.63					
		² s _i	3.76	4.44	2.38	1.05					
		F _{i-0}	8.74	2.31	4.86	1.46	5.99	2.27	5.99		
			(F/F)	2.21	2.26	3.06	2.06				
			max. (F/F) _c								
IX	n	X	5.14	4.90	4.88	4.13					
		² s _i	2.03	3.96	1.71	1.32					
		F _{i-0}	6.12	2.06	3.49	1.83	3.34	1.29	3.34		

(140)
T A B L E - 12 (contd.)

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SUPERVISORS										WORKERS				
CS-1	CS-2	(F/F) CS	DS-1	DS-2	(F/F) DS	KS-1	KS-2	(F/F) KS	(F/F) S	WCJ + WDC	M=(F/F) max	F max.	(F/F) max.	
3.06	3.31		4.15	3.55		3.12	3.37			2.12	5.21	1.34	3.41	4.49
2.36	1.43		1.32	1.59		1.36	2.13			1.54				
6.74	3.76	1.79	5.75	4.97	1.16	4.69	4.84	1.03	1.74	9.06				
3.70	3.75		4.65	4.27		4.12	4.42			3.74	4.25	1.60	4.00	
1.66	.71		1.66	.97		.74	1.44			1.79				
4.74	1.87	2.53	7.23	3.03	2.39	2.55	2.59	1.02	2.48	10.53				
4.00	4.06		3.80	4.14		4.24	4.42			4.36	4.88	1.38	4.12	
1.35	1.3		1.12	1.17		.94	.79			1.12				
3.86	2.79	1.38	4.88	3.66	1.33	3.24	1.80	1.80	1.35	6.59				
3.56	4.06		4.30	4.14		5.47	3.79			4.14	8.28	1.39	4.47	
2.14	1.93		1.69	2.77		1.27	3.12			1.93				
6.11	5.06	1.21	7.35	8.66	1.18	4.38	7.09	1.62	1.37	11.35				
1.75	2.72		.51	2.86		1.84	2.74			1.72				
4.90	4.46		4.65	5.00		4.12	3.84			4.86			4.72	
2.88	1.73		1.25	1.71		2.23	.77			1.77				4.49
8.23	4.5	1.81	5.45	5.34	1.02	7.69	1.75	.39	4.30	6.88	2.06	1.85		

(141)

TABLE - 12 (contd.)

1	2	3	4	5	6	7	8	9	10
Group	Item	Para-meter.	M-G	E-M	(NI) T	(NI) RT	(F/F) NI-MG	(F/F) T-RT	(F/F) M
IX	t	X	4.09	3.40	3.81	3.19			
		s_i^2	2.89	2.93	3.36	2.16			
		F_{i-o}	6.72	1.53	6.86	3.00	2.24		4.48
	v^1	X_2	4.67	4.40	4.88	4.06			
		s_i	2.63	1.78	2.52	1.13		2.23	
		F_{i-o}	6.12	1.08	5.14	1.57	3.90		5.67
		$(F/F)_m$	1.09	1.91	1.97	1.96			
		F_c							
O		X	4.90	4.80	4.75	4.00			
		s_i^2	3.59	4.40	1.40	2.00			
		F_{i-o}	8.35	2.29	2.86	2.78	3.00		3.65
	r	X	3.90	4.20	4.44	3.81			
		s_i^2	4.09	5.67	3.33	2.05		2.39	
		F_{i-o}	9.51	2.95	6.80	2.85	3.34		3.34
V		X	5.05	4.40	4.1	4.44			
		s_i^2	2.43	4.46	2.03	2.13			
		F_{i-o}	5.65	3.36	4.14	2.96	1.91	1.40	1.91
		$(F/F)_{max.}$	1.68	1.47	2.38	1.06			
		$(F/F)_c$							

(142)
TABLE - 12 (contd.)

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SUPERVISORS										WORKERS				
3.39 .87 2.49	3.00 3.47 9.13	3.67	3.00 2.22 9.65	3.82 2.35 7.34		2.71 2.47 8.52	3.58 2.14 4.86	1.75	2.80	4.42 .94 5.53	1.89	2.86	3.57	
3.63 1.95 5.57	4.33 2.44 6.42	1.15	4.23 1.32 5.75	3.73 2.18 6.81	1.18	3.94 1.56 5.39	3.84 2.11 3.07	1.76	1.53	5.60 1.49 8.76	5.73	1.34	4.24	
3.31	2.00		1.77	1.37		1.58	2.78			1.58				
4.16 2.05 5.86	4.81 3.76 9.89	1.69	4.00 2.52 10.98	4.59 2.35 7.34	1.50	4.71 1.72 5.93	4.79 2.06 4.68	1.27	4.30	6.05 1.17 6.88	3.58	3.23	4.69	
3.50 1.37 3.91	4.19 1.72 4.53		4.20 1.49	4.18 2.91		4.71 .47	4.74 1.43			2.19 2.37	8.06	2.19	4.01	
		1.16	6.47	9.09	1.40	1.62	3.25	2.01	1.73	13.94				
3.28 4.90 14.00	4.25 3.04 8.00		5.15 1.51	3.23 2.47		4.82 3.23	4.47 1.93			5.19 6.6	20.31	2.31	4.35	
		1.75	6.58	7.72	1.17	11.45	4.39	2.61	2.23	38.8				
5.58	2.18		1.70	1.24		7.06	1.44			5.64				

(143)

T A B L E - 13.FREQUENCY DISTRIBUTION (%) OF RANKS
IN SUB-SAMPLE DS-1 & CS-1.

Rank	f		fraction		cum fraction		cum%	
0.5	⁺ 21	18	0.03*	0.03 ⁺	.03*	.03	3	3*
1								
1.50								
2	53	63	0.1	0.8	.12	.11	11	15
2.50								
3	114	113	0.21	.17	.21	.28	28	36
4	164	178	0.3	.25	.33	.53	53	69
5	180	120	0.32	.28	.22	.81	81	91
6	93	39	0.17	.14	.07	.95	95	98
7	28	9	0.05	.04	.02	.99	99	100
		<u>540</u>			<u>1.00</u>			
8	<u>7</u>			.01		1.00	100	
	660							

* For subsample CS-1
used in the test-run.

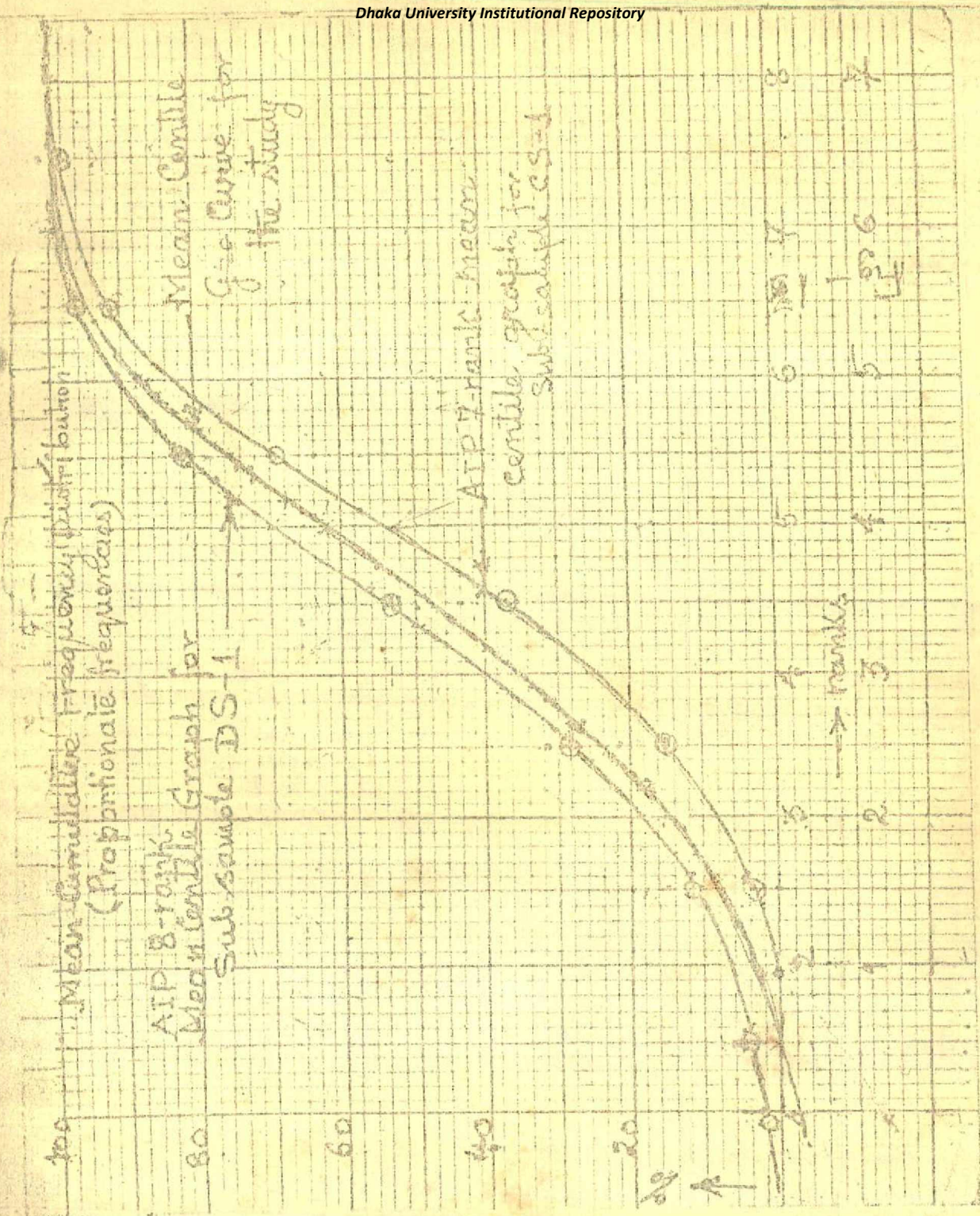
+ For subsample DS-1

(144)

TABLE - 14

Values of χ^2 (for randomness of sample) Persons r and modified rank corr. coeff. rr (Split-half Test) etc.

Particulars	No.	Size	χ^2	theor	χ^2	cal.	r	r_p	r^2	EP%	S	S^2
1. Managers (Genl.)	S ₁	21	3.80	1.76	.66	.83	.46	27	4.45	.66	.43	
2. Managers (Export)	S ₂	10	3.80	1.60	.11		.01	.61	4.12	1.39	1.92	
			11.10	8.19								
3. Manager (Nationalized Ind.)	S ₃₋₃	16	3.80	2.13	.68	.85	.46	27	4.42	.70	.49	
4. Supervisors (Khulna-1)	S ₄	17	5.99	5.73	.72	.80	.52	31	4.33	.54	.29	
5. Supervisors (Khulna-2)	S ₅	19	5.99	2.56	.84	.81	.71	46	4.41	.19	.44	
6. Supervisors (Dacca-1)	S ₆	20	7.19	1.3	.57	.79	.32	18	4.29	.48	.23	
7. Supervisors (Dacca-2)	S ₇	22	3.80	.70	.74	.77	.55	33	4.41	.57	.32	
8. Supervisors (Ctg.-2)	S ₈	16	3.80	1.0	.67	.80	.45	26	4.20	.62	.38	
9. Supervisors (Ctg.-1)	S ₉	18	5.99	2.33	.74	.83	0.55	33	3.87	.59	.35	
10. Workers (Crescent)	S ₁₀	21	7.8	15.9	.66	.51	.44	25	4.44	.42	.18	
11. Workers (DC)	S ₁₁	21	7.8	6.8	.69	.73	.48	29	4.21	.61	.37	



(145)

T A B L E - 15(a)

Weighted Average Predictive Efficiency, E%,
of the AIP 8-rank Scale.

From the Split-half Test, the value of Pearson's r for each Sub-sample gave the Predictive Efficiency of the Scale for each Sub-Sample, $E = \left[1 - \sqrt{1-r^2} \right] \times 100$ was found out.

Then, the weighted Average Predictive Efficiency of the AIP 8-rank Scale was calculated as follows :

$$\% E \text{ wtd.} = \frac{\sum (E_1 \times n_1)}{n_1 + n_2 + \dots + n_{10}}$$

where $E_1, E_2, \dots$ = Predictive Efficiency of the
Scale for each Sub-sample.

$n_1, n_2, \dots$ = Size of each Sub-Sample.

In this particular study,
the values of E.S and n.s are found to be

Size of Sub-Sample	n_1	n_2	n_3	n_3	n_4	n_5	n_6	n_7	n_8	n_9	n_{10}	n_{11}
	21	10	16	16	17	19	20	22	16	18	21	21
Predictive Efficiency of the Scale.	27	61	27	27	31	46	18	33	26	33	25	28

$$N = n_1 + n_2 + \dots =$$

$$E_1 n_1 = (E_1 n_1) + (E_2 n_2) + \dots$$

$$= (27 \times 21) + (.61 \times 10) + \dots$$

$$\therefore E \text{ wtd.} = \frac{\sum (E_1 N_1)}{N} = \frac{26.5\%}{1} =$$

(146)

T A B - E - 15(b)

Results of conversion: Equivalent

Gross % change in Prod.,		Pg
1950-51	10.0	100
1951-52	12.0	120
1952-53	15.0	150
1953-54	18.0	180
1954-55	20.0	200
1955-56	22.0	220
1956-57	25.0	250
1957-58	28.0	280
1958-59	30.0	300
1959-60	32.0	320
1960-61	35.0	350
1961-62	38.0	380
1962-63	40.0	400
1963-64	42.0	420
1964-65	45.0	450
1965-66	48.0	480
1966-67	50.0	500
1967-68	52.0	520
1968-69	55.0	550
1969-70	58.0	580
1970-71	60.0	600
1971-72	62.0	620
1972-73	65.0	650
1973-74	68.0	680
1974-75	70.0	700
1975-76	72.0	720
1976-77	75.0	750
1977-78	78.0	780
1978-79	80.0	800
1979-80	82.0	820
1980-81	85.0	850
1981-82	88.0	880
1982-83	90.0	900
1983-84	92.0	920
1984-85	95.0	950
1985-86	98.0	980
1986-87	100.0	1000

Attitudinal score, ranks	1	2	2.5	3	3.5	4	4.5	4.75	5	5.25	5.5	5.75	6.0	6.25	6.5
--------------------------	---	---	-----	---	-----	---	-----	------	---	------	-----	------	-----	------	-----

[illegible]

(147)

T A B L E -- 16.

Difference in the Net % change in
Production predicted by two diffe-
rent measures.

Net % change predicted by the two different measures i.e. by using (1) the weighted Average Predictive Efficiency of the AIP scale used, and (2) the combined effects of the Coefficient of attributes tetracloric co-efficient and the contingency coefficient in the form $(r_a^{12}) \times (1 - C)$.

Item	$P_n = P_g \times E$	$P_n = P_g \times r_a^{12} \times (1 - C)$	Rank Correlation Coefficient r_r
a	13.5	12.1	
b	17.0	14.0	
c	17.0	13.0	
d	12.5	14.0	
e	18.0	18.7	
f	11.5	12.9	
g	10.5	11.8	
h	16.0	14.5	
i	16.0	19.3	
j	15	12.0	
k	16.5	21.0	
l	20.0	21.0	
Total	183.5	184.3	0.81
$\% \text{ difference} = \frac{.8}{183.5} \times 100$			

= .4

COST - BENEFIT ANALYSIS
FOR MEASURES SELECTED BY THE PRODUCTION PREFF-
RENCE SCHEDULE RESULTED FROM THE PRESENT STUDY.

1. Estimates for item u of the AIP Schedule, which now stands as under :

- u. The population believes that if new machines replace old machines requiring over-hauling or repairs at least once in every 3 months, production will increase by 16.5% i.e. by 82,500 tons/year.

Estimated cost of BMR.

Estimated cost of BMR (PP VI)⁽⁴⁷⁾ = Tk. 60 crores.

Distributing the cost over a span of 10 years, estimated cost of BMR per year = Tk. 6 crores.

Predicted increase in Production.

after BMR. = 82,500 tons/year.

By UNIDO Report,⁽¹⁰⁾

For sale price of Tk. 6778 per ton, in 1977-78⁽¹⁴⁾ Cost of (Raw Jute+capital) was = (4373 + 623)⁽¹⁰⁾ = 5000 Tk.

Assuming proportionate increase,

For sales price of Tk. 8342 per ton of Jute goods sold, Cost of (Raw Jute + Capital) will be = $5000 \times \frac{6778}{8342}$ Tk./ton.

= 6154 Tk/ton.

If only raw jute and interest are required to give this predicted extra production, then per ton cost will reduce by 8342 - 6154 = 2188 Tk. say, 2200 Tk. Spreading the cost of BMR over 10 years, Net amount predicted to be available, to reduce the total loss = $(82,500 \times 2200)$ = 6,00,00,000

$$= 18, 15, 00,000 - 6,00, 00, 000$$

$$= 12, 15,00,000 \text{ Tk./Year.}$$

Estimated Increase in the production of jute goods after BMR (pp 402)⁽⁴⁷⁾
= 238,000 tons/yr.

∴ Net amount estimated
to be available to reduce
the total loss = $(238,000 \times 2,200)$ - 6,00,00,000

$$= 52,36,00,000 - 6,00,00,000$$

$$= 46, 36, 00,000 \text{ Tk./Year.}$$

INTREPRETATION:

There seems to be sufficient scope to reduce the chronic loss of the jute industry by implementing this measure. Total loss will reduce by Tk. 46.36 crores/year.

Assumption:

Item u of the AIP scale indicates only the 'Replacement' part of the whole BMR Programme. This may therefore be taken as 50% of the whole.

COST BENEFIT ANALYSIS FOR
MEASURES OF THE PREFERENCE SCHEDULE.

Estimates of benefit vis-a-vis cost for item w of the AIP schedule used in the present study; the item reads as follows :

w. If better quality raw jute is supplied to the machines, production will, in the opinion of the population as a whole, increase by 20% i.e. by about 1,00,000 tons per year.

National Management Development Programme of UNDP-ILO report⁽⁵⁶⁾ estimates total increase of Tk. 56 lakhs (Tk. 5.6 million) for about 18,000 tons of quality raw jute - the yearly consumption by M/s. Latif Bawany Jute Mills.

This amounts to about Tk. 300 per ton in excess the normal cost, Thus, taking the total raw jute consumption of all the jute mills to be about 5 lakh tons per year, and taking an excess of Tk. 500 per ton, because of using quality raw jute (300 + cost of maintaining the quality etc.) -

a. the total extra cost involved.

$$= (6,00,000 \times 500 , + (1,00,000 \times 500) *$$

*(cost of raw jute + finance).

$$= 30,00,00,000 + 50,00,00,000$$

$$= 80,00,00,000 \text{ Tk./Yr.}$$

b. Revenue derived from this predicted extra-production of 1 lakh tons.

$$= (1,00,000 \text{ tons} \times 8342 \text{ tk./ton}) \leftarrow \% \text{ of total sales as selling cost.}$$

(151)

$$= 83,42,00,000 \text{ Tk./yr} - 4,17,10,000$$

$$= 79,24,90,000 \text{ Tk./yr.}$$

The net benefit predicted to be derived

$$= 75,10,000 \text{ Tk./year.}$$

INTERPRETATION: It seems that though the population believes that, the over-all production may, with all probability, increase by about 20%, it may finally add to the total loss of the industry, if this measure is implemented. In other words, there may be a net loss if much too good quality raw jute is supplied to the machines.

Corollary/Sub-hypothesis : There is therefore a certain batch composition which will give the minimum loss. That particular batch composition will have to be experimentally determined for various raw jute prices and the prices of the jute goods in the international markets.

3. Estimates for items f,e,s and g of the AIP Schedule.

The population believes that -

- f. If all management staff are given more technical training relating to their own field, production will increase by 17% i.e. 85000 tons/year.
- e. If all management staff are given good management/supervisory training, production will increase by 17% i.e. 85000 tons/yr.
- s. If all supervisors give clear job instruction and a helping hand to all subordinates/employees/workers production will increase by 15% i.e. 75000 tons/year.

(152)

- g. If all management staff behave well will people working under them production will increase by 12.5% i.e. 62,500 tons/yr.

The implementation of these measures will call for good selection procedure and training.

As of March '79⁽¹⁵⁾ total officers and staff of all the mills of BJMC stands at 24,334.

Cost involved in training/selection.

Assuming an expenditure of Tk. 2,000 per year per officer and staff, on training, total annual training cost comes out to be = Tk. 4,86,68,000/- say, Tk. 5,00,00,000/-.

Revenue Predicted to be accruing :

Sales value (78-79) of extra production predicted

$$= 62,500 \times 8,342$$

$$= 52,13,75,000 \text{ Tk/yr.}$$

$$\begin{aligned} \text{Total cost of (raw jute + capital + capital)} &= 5000 \text{ per ton} \\ \times 62,500 \text{ tons} &= 31,25,00,000 \end{aligned}$$

$$\text{Cost of selling @ 5\%} = 2,60,87,500$$

$$33,85,87,500$$

$$\therefore \text{Net Benefit} = 18,27,87,500 \text{ Tk./Year}$$

INTERPRETATION: If good selection, technical training, managerial training and supervisory training for each of the managers, supervisors and other staff-cost Tk. 2,000/- per year on the average, there may be a minimum net benefit of Tk. 18.28 crores (Tk. 182.8 million) that may be available to reduce the total loss of the industry.

(53)

4. Estimates for item i of the AIP Schedule.

- i. If regular maintenance of machineries is done, the population believes that the total production will increase by 18% i.e. by about 90,000 tons/yr.

Cost of implementing the measure (estimated).

At present, average expenditure on repairs and maintenance, in all the mills of BJMC, is about 3% (Ref: (47) pp(277);(56) (pp-IV). Taking 3% for preventive maintenance activities, Total Cost involvement will be -

$$\begin{aligned}
 &= 3\% \text{ of the sales value of } 5,90,000 \text{ tons} \\
 &= .03 \times 590000 \times 8342 \\
 &= 14,76,53,400 \text{ Tk/Year.}
 \end{aligned}$$

Benefit/Revenue

$$\begin{aligned}
 \text{Total Revenue predicted} &= \text{Sales value of extra production} \\
 &= \text{Cost of (raw jute + capital)} \\
 &= \text{Cost of selling, (5\% of sales).} \\
 &= (90,000 \times 8342) - (90,000 \times 5000) \\
 &\quad - (9000 \times 8342 \times 0.05) \\
 &= 75,07,80,000 - 45,00,00,000 - 3,75,39,000 \\
 &= 26,32,41,900 \text{ Tk/year.}
 \end{aligned}$$

$$\therefore \text{ Net Benefit} = 26,32,41,600 \text{ Tk/year.} - 14,76,53,400$$

$$= 11,64,88,200 \text{ Tk./Yr.}$$

(154)

INTERPRETATION: If all repairs and preventive maintenance requires 5% of the sales value (77-78), implementation of this measure will reduce the total loss of the industry by Tk. 11.56 crores per year.

5. Estimates for items/measures n and l of the AIP Schedule, which now stand as under :
 - n. If efficient and experienced workers/employees have chance for promotion to any higher post, upto the post of General Manager, production will increase by 16% i.e. by 80,000 tons/year.
 - l. If departmental heads are allowed to set the production target, production will increase by 10.5% i.e. by 52,500 tons/year.

These two measures are additive in nature because, they are independent of each other, Therefore, their implementation will, as the population believes, result in $(16 + 10.5) = 26.5\%$ by about 1,32,500 tons/year.

Cost involved in implementing the measures.

The cost involved will be that of grooming & training, before promotion and in order to increase their decision making ability.

Assuming an average cost of Tk. 1000 per managerial staff including supervisors for about 25,000 managers, supervisors and other staff, total cost of training comes to be = Tk. 2,50,00,000 per year.

*Taking an equal amount for the expected new promotées, the total cost comes out to be = Tk. 5,00,00,000 per year.

[* assumption]

Benefit predicted be accruing.

Total Benefit expected = Sales price of this 1,52,500 tons extra product - cost of (raw materials + capital) to produce the amount - cost of selling if, @ 5% of sales value.

(155)

$$\begin{aligned}
 \text{i.e. Net Revenue} &= (1,32,500 \times 8,342) - \\
 &\quad (1,32,500 \times 5,000) - \\
 &\quad (1,32,500 \times 8,342 \times 0.05) \\
 &= (117.14 - 66.25 - 5.86) \\
 &\quad \text{crores.} \\
 &= 45.03 \text{ crores, Taka/Year.}
 \end{aligned}$$

Net Benefit expected

$$\begin{aligned}
 &= 45.03 - 5.00 \text{ crores.} \\
 &= 40.00 \text{ crores, Tk./year.}
 \end{aligned}$$

INTERPRETATION: By implementation of these two measures only, the total loss of the jute industry may be reduced by 40.00 crores of Taka per year.

6. The cost-benefit estimates of item o of the AIP Schedule which stands as follows :

- o. If cost of living comes down to the pre-liberation level, the population believes that production will increase by 16% i.e. by 80,000 tons/year.

This is an external factor and cannot be controlled by the management. As such it has been thought of as an impracticable measures.

Of course, something like cost-of-living allowance could be calculated as the equivalent cost. This will create the problem of wage-price spiral and may lay dangerous effect on the economy. Moreover, once it is established, constant labour-management trouble/tension/bargaining will come into play, on the question of adjustment of the allowance.

However, if at anytime, there is such a question, it will have to be calculated as under :

BENEFIT EXPECTED :

Maximum increase in production expected = 16%

= 80,000 tons/year.

Net Revenue accruing = $(80000 \times 8342) - (80000 \times 5000) -$
 $(80000 \times 8342 \times 0.05)$

= Tk. 24.16 crores per year.

∴ MAXIMUM COST OF LIVING ALLOWANCE :

= Tk. 24.16 crores,

= Tk. 20 crores, say

= (Total salary + wage) $\times x$

The salary and wage bill for 1977-78 = Tk. 7281 lakhs ⁽¹⁵⁾⁽⁷⁷⁾

= $(72.81) \cdot x$

= $(80 \cdot x \text{ say})$

or $x = \frac{72.81}{80} = .25 = 25\%$

INTERPRETATION: If there is any unsurmountable pressure or bargaining on the question of raising salary and wage etc. to compensate for high cost of living, management may give a total hike, not exceeding Tk. 20 crores which is about 25% of the total salary, wage and benefits given by the BJMC in 1977-78.

Providing a safety margin of 25% of this amount, the maximum desirable amount comes to be about 18% of the present bill.

In that situation, as predicted by the population, there will be no net gain that may go to reduce the total loss of the industry.

(157)

7. Cost benefit estimates for item c of the AIP Schedule which stands as follows :

C If workers are given facilities such as housing etc. the population believes that production will increase by 13.5% i.e. by about 67,500 tons/yr.

Net revenue expected =

Sales price of this extra production -
 - Cost of (material + capital).
 - Cost of sales (@ 5%).
 = $(67,500 \times 8342) -$
 $(67,500 \times 5000) -$
 $(67,500 \times 8342 \times .05)$
 = Tk. 19.80 crores,
 say, 20.00 crores.

Cost involved

Assumption : Average cost of construction of houses per workers
 = Tk. 20,000

Taking a rate of depreciation = 5%

Yearly cost per worker = 1,000

∴ Total cost for the industry = $1000 \times 2,00,000$

= Tk. 20,00,00,000 per year

∴ Net benefit predicted to be accruing =

$20.00 - 20.00 = 0.$

INTERPRETATION: There will be no economic gain by implementing this measure. Rather the industry may incur more losses. But if at all housing is to be provided to all the workers of the jute industry, cost of construction of building should not exceed Tk. 20,000 per worker, if jute goods sell at Tk. 8342 per ton.

Roughly, the cost of construction of houses per worker should not be more than the average cost of two tons of jute goods.

8. Cost-Benefit analysis for item j of the AIP Schedule, which stands as under :

j. The population believes that if the working place is kept cleaner and cooler, production will increase by 11.5% i.e. by about 57,500 tons/year.

Benefits expected/predicted to be accruing :

$$\begin{aligned}
 \text{Net Revenue} &= \text{Sales price of 57,500 tons} \\
 &\quad - \text{Cost of raw materials \& capital} \\
 &= \text{Cost of sales @ 5\%} \\
 &\quad - (57,500 \times 8342) - (57,500 \times .05) \\
 &\quad = (57,500 \times 5000) \\
 &\quad = 16.85, \text{ Tk., crores.}
 \end{aligned}$$

Cost involved :

- Assumptions :
- (i) Average cost of an exhaust fan + a cooler + other accessories required to keep the place of working, cooler and cleaner + cost of maintaining these equipments at = Tk. 10,000/-
 - (ii) On the average, 100 such sets will be required for each of the 77 jute mills under BJMC.
 - (iii) These sets will be depreciating at a rate of 10% per annum.

In that case,

Total cost involved in installing 100 sets of collers & exhausts etc. in the 77 jute mills = $10,000 \times 100 \times 77 = 7,70,00,000$ Tk.

Spreading this over a span of 10 yrs.,

(159)

Cost per year = 77,00,000 Tk.

∴ Net Benefit = 16.85 - .77 = 16.08 Tk.,
crores per year.

INTERPRETATION:

By making an initial investment of about Tk. 7,7 crores, for keeping places in the mill, cleaner and cooler, the total yearly production may be increased by 11.5% or about 57,500 tons.

RESULTS OF DATA ANALYSIS: CONSTRUCTION OF
A REFERENCE SCHEDULE OF INCENTIVES OR PRO-
DUCTION INCREASING MEASURES.

Efficiency of the 8-rank scale, E = 28.5% (wtd. Average)

Sl. No.	Item of the 8-rank AHP Scale.	Short-Description.	M=(F/F) Max.	Wtd. Ave Attitudinal Score	Pre-dicted wtd. Ave. Change in Production	Predicted effective change in production %	Net Rev. or Gross Benefit Tk. Crores per yr.	Cost Involved Tk. Crores per yr.	Net Bene-fit Tk. Crores per yr.	Suit-able for imple-mentation	Net Suit-able for imple-mentation	Order/ Rank of Preference.	
1.	W	Qty. raw jute	2.69	5.21	72	20	100	79.25	80.00	-0.75	X	NS	-
2.	i	Preven-tive Maintenance.	3.75	4.89	63	18	90	79.25	14.76	11.76	S	X	6
3.	c&f	Mgmt.& Tech. Training	2.89	4.81	60	17	85	24.85	5.00	19.85	X	X	1
4.	u	Re-placem(BMR)	2.44	4.77	58	16.5	82.5	12.00 (46.00)	6.00	6.00 (40.00)	S		8
5.	n	Scope of promo-tion to the top.	2.15	4.72	57	16	80	23.40	5.00	18.40	S		2

(161)

T A B L E - 17(contd.)

RESULTS OF DATA ANALYSIS : CONSTRUCTION OF A PREFERENCE SCHEDULE OF INCENTIVES OR PRODUCTION INCREASING MEASURES.

Efficiency of the 8-rank scale, E = 28.5% (wtd. Average)

Sl. No.	Item of the 8-rank scale.	Short-Description.	M-(F/F) max	Wtd. Ave.	Attitudinal Score $\bar{X}_x$	Pre-dicted wtd. Ave. change in production.	Predicted effective change in production (p) %	Net Reve. or Gross Bene-fit Tk. Crores per yr.	Cost involved Tk. Crores per year.	Net Bene-fit predicted/estimated Tk. Crores per yr.	Suitable for implementation.	Net suitable for implementation.	Order/ Rank of Preference.
6.	s	Clear Job Ins. construction	1.73	4.65	55	15	75	21.93	5.00	16.93	S		3
7.	c	Housing, Medical, etc.	2.45	4.37	47	13.5	67.5	20.00	20.00	-	S*	NS	9
8.	g	Good Behaviour.	2.64	4.25	44	12.5	62.5	18.28	5.00	13.28	S		5
9.	j	Celar & Cool working place.	2.51	4.08	40	11.5	57.5	16.85	0.77	16.08	S*		4
10.	l	Decision at Deptt. level.	4.25	4.00	38	10.5	52.5	15.25	5.00	10.25	S		7
11.		Cost of Living Allowance.	3.58	4.69	56	16	80	23.40	23.40	x	S	NS	10

Socially and politically desirable.

T A B I L E - 18. (56)

HISTORICAL DATA FOR COMPARISON WITH
PREDICTED CHANGE IN PRODUCTION.From Table - 2 (pp-5) and Appendix-V
of the Report.

1.	% Time lost by Ends Down due to yarn Breakage ...	20.00
2.	% Time that may be improved to ...	8.00
3.	∴ Possible improvement in % time to be lost in Ends down, but using quality Jute. ...	12.00
4.	% timelost due to sliver shortage =	6.5%
5.	% Time lost due to Cleaning & Mech. Fault. =	5%
6.	% Time lost due to Temporary absence of operator (lack of close supervision?)	7%
7.	% Time lost due to Doffing =	9.5%
8.	∴ Scope of Increase in Production by control.	6.0 + 50
9.	Scope of increase in production by Quality Control/using quality jute. =	12%
10.	Scope increase in production by a closer supervision.	6%
11.	" by Training and incentives reducing (6) & (7) above.	6+3=9%

Machine time spent on spinning = 53%
i.e. 53% of Machine-time = 100% (Production(Present)).

∴ 1%..... $\frac{100}{53}$ Production.

% time lost due to shortage of spare weaver and Yarns = 6.5+7

= 13.5%

(56) Powell, VGE, "Initial Report on Latif Bawany Jute Mills Ltd." BMDC, Sept., 9, 1976.

(163)

T A B L E - 19

Equivalence of Process Loss with production per year. (47)(pp-42 & 167)

Year	Average Wastage %	Diff.	Total Annual Productions, Tons	Difference.
1974-75	10.00		444306	
1975-76	8.97	1.03	477921	33,615
1976-77	7.95	1.02	490057	27,936
1977-78	7.47	.48	546333	56,276
		2.53		1,17,827

$$2.53\% = 1,17,827 \text{ tons}$$

$$1\% = \frac{1,17,827}{2.53} \text{ tons.}$$

$$= 46,000 \text{ tons.}$$

$$= \frac{46,000}{5,00,000} \times 100\%$$

$$= 9\% \text{ of total annual production.}$$

Intpretation: 1% change in wastage or process loss will bring about a change of 9 - 10% in the total average annual production.

(164)

T A B L E - 20PRODUCTION LOSS DUE TO LOOMS REMAINING IDLE.

M. Moinuddin Khan and Others "A Study of Jute and Cotton
Textiles "Vol. 1(Jute Textile)Planning Commission, GPRB, Jan.'79.

Page - XXXVI.

Total Idle Capacity . . . 20.85% = 21%

Page - 39

23% of the looms installed, and

27% of the looms operating at the sample mills were idle.

Reasons for Idle looms (1976-77)

Causes	% of			
	Total	21%	23%	27%
1. Mechanical/Maintenance troubles.	16	3.3	3.7	4.32
2. Shortage of spares	16	3.3	3.7	4.32
3. Weaver's shortage	30	6.3	6.9	8.1
4. Yarn shortage	13	2.73	2.99	3.61
5. Power Failure	4	.84	.92	5.67
6. Others	21	4.41	4.83	5.67

Production loss due to other reasons = (5) + (.6)

= 0.84 + 4.41

= 5.25%

(165)

T A B L E - 21

Deductions for the purpose of comparison
between predicted Data and Historic Data.

1. Distribution of loss in production1976 - 1977

Pages (xxiii)-(a)

Looms operating	20,261
Achievable Standard Output	= 5,87,541 tons/yr.
Actual Production	= 4,90,057 tons.
∴ Less in Production	= 97,484 tons
	= 16.6%

<u>Cause of loss in production</u>	<u>% of total loss.</u>	<u>% of total production at 21%</u>	<u>at 16.6%</u>
1. Maintenance/Mechanical Troubles.	21%	21% of 3.48%	16.6%
2. Shortage of Parts	5%	3	
3. Weaver Shortage	33%	5.48	
4. Yarn shortage	16%	2.58	
5. Power failure	10%	1.67	
6. Unspecified reasons	15%	2.49	
	100%		

N. B. (2) + (3)+(4)

$$= .83 + 5.48 + 2.58 = 8.89$$

(5) + (6) = Loss in production due to other reasons.

$$= 1.67 + 2.49$$

$$= 4.16$$

(166)

T A B L E -22.

Available Capacity = 21 %

Cause of loss in production.	% total loss	% of total production.
1. Maintenance/ Mechanical Troubles.	21	21% of 21% = 4.4
2. Shortage of parts.	5	1.05
3. Weaver shortage	33	6.93
4. Yarn shortage	16	3.36
5. Power shortage	10	2.1
6. Unspecified reasons		3.15

(167)

T A B L E - 23RATED, ACHIEVABLE AND ACHIEVED
CAPACITIES OF THE JUTE INDUSTRY.Weaving Efficiency

a. lbs./loom/Hr.	H	S	CS	Others	To
(i) Rated	12.50	29.03	22.57	-x-	12
75% rated	9.37	21.77	16.93		
(ii) Achievable/ optimum feasible.	7.0	19.0	15.00		
(iii) Actual Obtained by 30th June '77	6.34	17.63	12.96		
b. Capacity in Lakh, tons.					
(i) As above	4.00	5.02	1.06	.03	12
(ii) "	2.17	3.13	1.06	.03	5.6
(iii) "	1.66	2.26	0.71	0.26	4.9
<u>% Capacity achieved.</u>					
(i) of achievable	76.05	72	67	87	74
(ii) of rated	41.5	45.02	67	wtd.Ave. 47	40.08
75% of rated	3.00	3.77	.79		8.0

Unavoidable losses of the Industry.
(pp 30(a))

Yarn Breakage		5%
Shuttle changing		12%
Small Maintenance/ Loom Tuning/ Routine Oiling		15%
		<u>32% of rated capacity.</u>

∴ Available capacity = 100 - (32 + 44)

= 100 - 79 = 21%

(16)

2) Estimated Increase in Production after BMR, Tons/Year.

$$\text{Hessian} = \frac{1,34,155}{3,10,798} = 43.16\%$$

$$\text{Sacking} = \frac{46,399}{3,11,819} = 14.88\%$$

$$\text{CBC} = \frac{57,537}{1,33,668} = 43.04\%$$

∴ Estimated, wtd. increase in production/Year.

$$= \frac{(43160 \times 311) + (14880 \times 312) + (43040 \times 133.7)}{311 + 312 + 133.7}$$

$$= 31.47\%$$

=====

T A B L E - 24DEDUCTION FOR SUB-HYPOTHESESSub-Sample CS-1: Classification of Data:

Sl. No.	Rank of X./A.	X o	Ao	Month salary Y Tk.	No. of Subs. S	NPC-2 Grades H from below	EXP Yrs.
1	4	4.5	82.5	905	59	4	21
2	6	3.3	46.5	1664	612	4	19
3	1	4.7	86	1290	74	3	9
4	2.5	4.6	85	1333	170	3	7
5	8	4.0	68.5	1453	50	3	9
6	56	4.4	80	1375	259	4	15
7	6	4.3	78	600	439	5	6
8	13	3.6	55	1355	164	4	15
9	17	3.1	38.5	1200	92	3	6
10	2.5	4.6	85	8370	81	3	13
11	9	3.8	62	1878	121	3	12
12	14	3.5	53.5	2260	230	3	5
13	11.5	3.7	58.5	9475	53	3	6
14	11.5	3.7	58.5	3087	-	3	6
15	18	2.7	29	1200	80	3	19
16	15	3.4	51.5	730	558	3	16
17	7	4.1	71.5	1143	163	3	8
18	9.5	3.8	6.2	880	210	3	7

T A B E - 24 (contd.)

DEDUCTIONS FOR SUB-HYPOTHESES

Edu. level.	Age, yrs.	Age of entry yrs.	No. of Depart- ments (D)	Lbs/hr./ man, (p)	No. of types of faci- lities enjoyed	.05 Y.H.S 100	A.H.S. ^{.05} 100
2	42	21	10	16.43	1,4,8,7*	44.53	4.06
2	37	18	7	8.67	1	64.31	2.57
3	26	17	7	10.57	2,4,8	33.59	3.20
5	28	21	7	56	7	36.29	3.31
3	25	16	7	16.47	x	x	37.32
2	35	20	8	2.16	1,2,3,4,7	58.08	4.22
12	29	32	2	x	2,3,4,7	81.24	5.29
2	43	28	8	7.35	1,2,3,4,6	55.93	2.84
6	30	24	8	11.04	1,2,5	36.1	1.48
2	45	22	8	10.8	1,2,3,6	33.3	3.14
5	38	20	6	9.4	1,2,3,7	42.94	2.36
6	25	20	4	6.06	1,2,7	35.62	2.10
5	28	22	8	18.14	2,6	27.74	2.14
5	27	21	3	x	1,2,3,4,5	-	-
6	40	21	9	28.8	1,2,3,4,7	40.39	1.09
2	35	19	8	3.3	1,2,4,8	30.92	2.13
2	28	20	7	5.4	7	30.96	2.77
8	27	20	9	6.2	1,7	31.05	2.43

* These numbers refer to the serial number
of facilities mentioned in the Questionnaire.

(77)

- Note :
- Xo = Average over-all attitudinal score in rank.
 - Ao = " " " " in percentiles.
 - H = Hierachial level from below (10th grade of NPC-2 being H=1).
 - P = Per Head productivity.
 - E = Level of education(S.S.S.C. = 2, H.S.C.-3 etc.)
 - S = No. of subordinates.
 - D = No. of dependents.
 - F = No. of facilities enjoyed.

ANALYSIS OF DATA FOR DERIVATION
OF SUB-HYPOTHESES

What determines attitude of industrial workers
towards incentives and productivity ?

1. Influence of fringes like housing, bonus, etc.

Test of indifference of having/enjoying fringes, bonus, etc.
for over-all attitudinal scores, in regard to measures raising pro-
duction.

Test Sample : Chittagong Supervisors - 1
(CS - 1)

Various fringes being enjoyed by subjects from different mills
at present include :

(1) Housing (2) Medical for self (3) Conveyance Allowance or Trans-
port (4) Medical for family (5) Attendance Bonus (6) Performance
Bonus (7) Bonus on Profit (8) Yearly Bonus (9) Any other.

Results:

Results of analysis have been tabulated on the next page.

INFLUENCE OF HOUSING FACILITY IN THE FORMATION
OF ATTITUDE TOWARD INCENTIVE AND PRODUCTIVITY.

Sl. No.	Facility enjoyed	r Tetrachoric Coefficient	r _o Critical Value of r for $\pm$ = 0.05 df = 17	Significant (S) or not Signi- ficant (NS)
1	Housing (1)	.44	.37	S
2	Bonuses(5,6,7 & 8)	.73		S
3	Bonuses(5 & 6)	.28		NS
4.	Bonus (8)	.50		S
5	Bonus (7)	.09		NS

INFERENCES AND HYPOTHESIS FRAMED.

1. It is thus inferred that bonuses have a significant influencing effect in shaping the over-all attitude towards incentives and industrial productivity. Of the bonuses, yearly bonus seem to have the most significant influence on attitudes of industrial supervisors, towards productivity.

Corollary: It is thus possible that yearly bonus is one of the most important determinants of attitudes of supervisors.

This may or may not be the case for managers and workers of the jute industry.

2. It is also inferred that housing facility enjoyed has a significant effect in forming a favourable attitude towards productivity.

Corollary: It is quite likely that housing facility is another important determinant of the over-all attitudinal score of supervisors.

T A B L E - 25.

2. Influences of various combinations of Salary/Wage, Hierarchy and Number of subordinates, on the mean attitudinal scores of the subjects.

Test Sample : CS - 1

Sample Size : 18

Test Method : Spearman's Rank

Correlation Method.

Results Obtained :

Sl. No.	Factors combined.	Value of r_r	Critical value of r_r at $\alpha = 0.05$ df = 17	Significant(S) or Not Significant (NS)
1.	A_o Vs $\frac{YHS \cdot 05}{100}$	0	0.37	X
2.	A_o Vs $A_o \frac{Y}{100}$	0.87		Highly Significant.
3.	A_o vs $\frac{0.01Y}{HS \cdot 05} A_o$	0.92		Highly Significant
Or				
	A_o vs $\frac{A_o}{(HS \cdot 05 / 01X)}$			
4.	$\frac{A_o Y}{100}$ v.s. $HS \cdot 05$	0.28		NS
5.	$\frac{A_o Y}{100}$ vs p^*_{LD}	0.03		NS
6.	$(A_o HS)$ vs P_{LD}	-0.18		NS
7.	$\frac{Y}{100} HS \cdot 05$ vs $A_o HS \cdot 05$	.53		S
8.	$\frac{Y}{100} HS \cdot 05$ vs P_{LD}	.22		NS

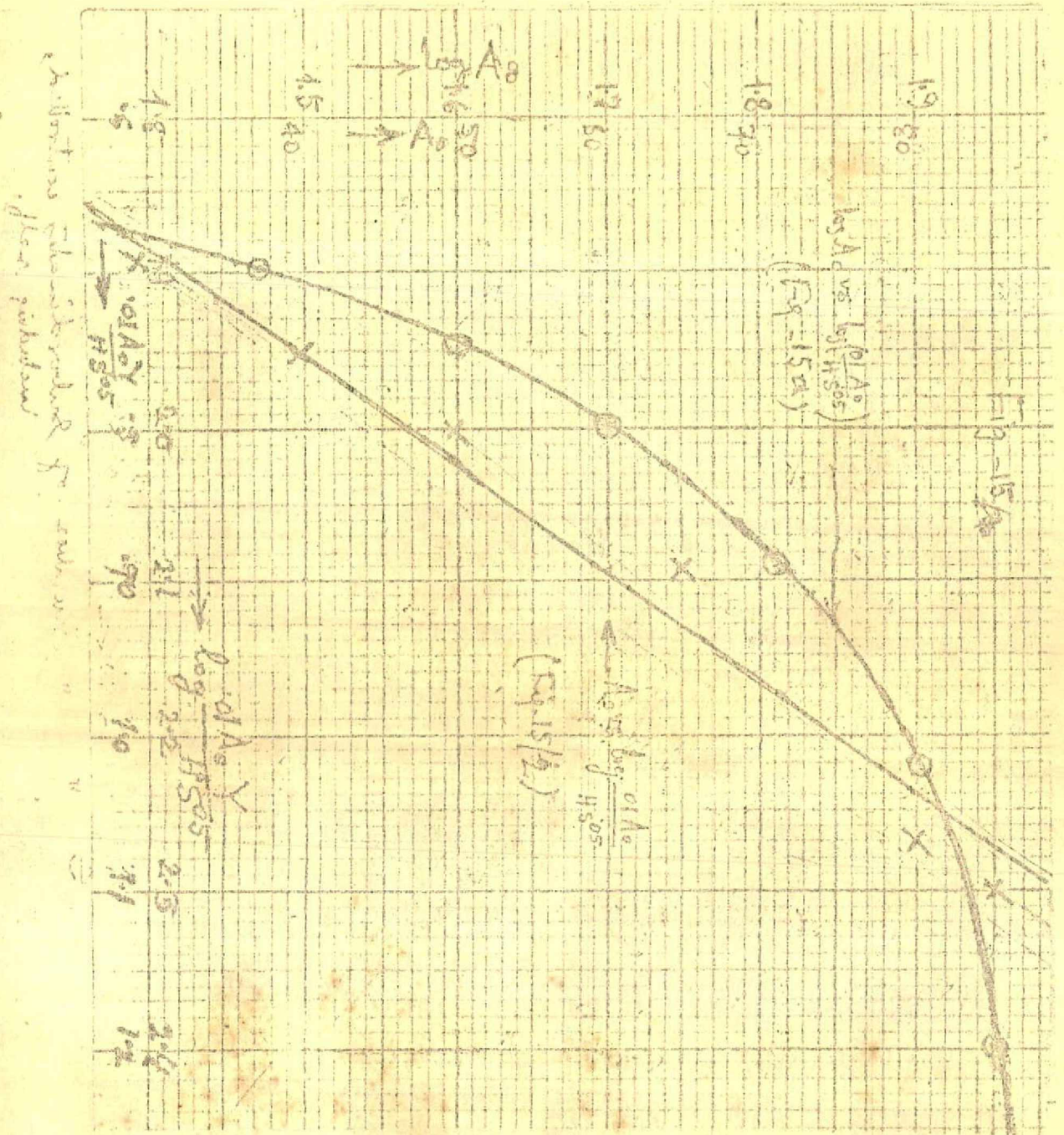


TABLE - 25 (contd.)

*P_{LD} stands for Departmental labour-productivity.

A_O stands for over-all attitudinal score (%)

Y " " monthly salary, Taka

H " " heirarchy represented by National Pay/
wage scale, in the reversed order.

S " " number of subordinates controlled, including
self.

(178)

Significance of the relationship
of Table 25 and Fig - 15/2.

Examples

Optimum (Psychologically maximum) salary that the Chairman of the Jute Corporation may be given under the present organisational environment of the industry may be determined as follows:

From Fig. 15/1, it is seen that the overall attitudinal score attains its maximum at about 90 ($A_o = 90$) when the corresponding value of the $\log\left(\frac{0.1 A_o Y}{HS \cdot 05}\right)$ is equal to 2.5.

Taking the total number of officers, staff and workers of the BJMC = 2,00,000 and $H = 10$ (the highest in the New National Pay Wage Commission).

$$\text{We get, } \log \left(\frac{0.01 \times 90 \times Y}{20 \times (2,00,000) \cdot 05} \right) = 2.5$$

$$\text{Or, } \frac{0.01 \times 90 \times Y}{20 \times (2,00,000) \cdot 05} = \text{Anti log } 2.5 = 316$$

$$\text{Or } Y = \frac{316 \times 10 \times 1.45}{90 \times .01} = 5,000.$$

Thus, it will be of no use to raise the total salary of the Chairman of the BJMC more than Tk. 5,000/- a month.

Maximum salary (all monetary benefits) of a worker may be deduced with the help of figure - 15/1 & 15/2 as under :

By extra-polation of Figure - 15/2

$$A_o = 1 \text{ when, } \log \left(\frac{0.1 A_o Y}{HS \cdot 05} \right) = 1.6$$

$$\text{i.e. when } \frac{.01 A_o Y}{HS \cdot 05} = \text{Antilog } 1.6 = 40$$

$$\text{Or, } Y = \frac{40 HS \times .05}{.01 \times 1} = \frac{40 \times 1 \times 1}{.01 \times 1} = 400$$

Thus, the minimum salary (monetary benefits) to a worker or to anybody having $H = 1$ (last grade) and no subordinate ($S = 1$) should be at least Tk. 400/- when he will not all be interested (or be immune) to any type of incentive and the increase in productivity.

Sub-Hypothesis framed.

1. In any given condition of the environment, the overall attitude of any one worker in the industry will be formed by a combined impact of his salary or wage, number of sub-ordinates and his hierarchy.

2. Corresponding to each hierarchy there is a limit of salary/wage (including the money value of any incentive given) and number of sub-ordinates close to which the attitude approaches a maximal value.

This then defines the effective maximum value of any salary, wage or incentive expressed in monetary terms, for any manager, supervisor or worker, in the present environmental conditions of the jute industry.

T A B L E - 26

3. Influence of various qualities and attitudes on the formation of attitudes towards incentives and productivity.

Correlation (r_r) Between Overall attitudinal score and various qualities/particulars of Supervisors of Jute Industry (Sample: Chittagong Supervisors 1).

Scale - 7 rank, AIP.

Critical value of Pearsorsons $r = 0.47$ at $\alpha = 0.05$
 $= 0.05$ $= 0.40$ at $\alpha = 0.10$

Sl. No.	Quality/Particular of the subjects.	Spearman's corr. Coefficient.
1.	Education	- 0.17
2.	Age	- 0.23
3.	Entry age	- 0.07
4.	Years of experience/ work in the jute industry.	- 0.04
5.	No. of facilities engaged	+ 0.11
6.	Output/hour/man	- 0.23
7.	No. of subordinate/workers.	+ 0.02
8.	Per Capita income(Salary)	- 0.05
9.	No. of dependents	- 0.12
10.	Salary	- 0.14

Hypothesis framed :

It is thus inferred that none of the qualities/particulars considered above, one at a time, have any significant influence in

(181)

shaping the attitude of the subjects (supervisors) towards incentives and productivity.

The same may or may not be true for managers or /and workers.

T A B L E - 27

Inter-Zone distribution of officers, (15)
staff and workers.

Zone	Tons Worker -3X10	% work- ers.	% offi- cers + staff	% offi cers.	% non clerk.	Staff	NC
Adamjee	197	14.44	11.41	12.17	13.36	3.74	2.17
Dacca-1	258	14.00	14.84	15.15	13.68	3.96	1.79
Dacca-2	222	20.98	21.07	22.21	19.48	3.78	1.73
Ctg.	240	21.26	23.68	22.77	25.58	4.24	2.23
Khulna	233	29.00	29.00	27.69	27.69	4.30	1.99

(15) : "Production efficiency for the month of March
1979". - BJMC, Dacca.

(182)

TABLE - 28.

Spearman's Correlation, r_r , between Labour-productivity and the difference in the distribution of officers, staff and workers (March, 1979).

% w = % workers, o = officer, nc=non-clerk
(o + s) = officers + staff = Officers + clerks + non-clerks,

Zone	Labour produc- tivity Tons/Yr/ worker x 10	(% w-%(o+s))	%w-%	% w-% nc	Staff o	nc o
Adamjee	197	-3.03	-2.27	-1.08	3.74	2.17
Dacca-1	258	+ .84	+1.15	+ .32	3.96	1.79
Dacca-2	222	+ .09	+1.28	- .05	3.78	1.73
Ctg.	240	+2.42	+1.51	+4.32	4.24	2.23
Khulna	233	0	-1.31	-1.12	4.30	1.99
r_r		-0.8	-0.5	-0.6	-0.6	0.0
for = 0.10 df= 3	r_c	= .80				

Observation and Interpretation:

From data above, it may observed that Adamjee has the lowest Labour Productivity and 11.41% of the total mills' officers of the BJMC are working to control 14.44% of its total labour force. At a confidence limit of $\alpha = 0.10$, the correlation between the % difference of distribution of woerkers and that of officers + staff, is

significant; if and when this difference increases there is 90% chances that the labour productivity will decrease.

T A B L E - 29.

* Spearmans Correlation between Labour Productivity/Over-all Productivity and worker ratio, worker ratio for various zones.
officer non-clerk.

ratio and worker ratio for various zones.
officer+staff

Zone	Tons ^a /Worker/ Yr. - 3 x 10	b Worker/ Officer	c Worker/ Non-clerk.	d Worker/ Officer+ Staff.	e Tons/Man/ Year x 10 ⁻³
1.Adamjee	197(1) ⁺	50(5) ⁺	23.05(5) ⁺	10.6(5) ⁺	180(1) ⁺
2.Dacca-1	158(5)	39.18(1)	21.83(2)	7.9(2)	229(5)
3.Dacca-2	222(2)	39.80(3)	22.98(4)	8.32(3)	198(2)
4.Chittagong.	240(4)	39.45(2)	17.73(1)	7.52(1)	212(4)
5.Khulna	233(3)	47.70	22.42(3)	8.43(1)	208(3)
r_{ra}		-0.9	-0.9	-0.8	
		-0.9	-0.9	-0.8	r_{re}

For

= 0.10 , Critical Value of $r = 0.30$

d.f. = 3

+ (1), (2), etc. are the ranks

r_{ra} = Correlation co-efficient of items in columns b, c, & d with respect to items in column a.

Observation & Interpretation: 1. There is a very significant correlation between Labour Productivity and the worker ratio.

officer, worker and non-clerk ratios - where impact of worker ratio is the highest
officer + staff Nor -clerk

(15)* "Production Efficiency For the month of March, 1979",
BJMC, Dacca.

-(34)

Sub-Hypothesis framed :

A disproportionate distribution of worker-officer ratio, worker-non-clerk ratio and worker-non-worker(officer-staff ratio) is an important determinant of the inter-zonal difference in the labour-productivity/production efficiency of the zone.

LIST OF REFERENCES AND BIBLIOGRAPHY

1. Afroz, Gul and Roy, Dilip Kumar: "Capacity Utilization in Selected Manufacturing Industries of Bangladesh", The Bangladesh Development Studies, Vol.IV, No.2, April 1960.
2. Ahmed, Hafizuddin: "Jute Weaving and Finishing", 1967.
3. Ahmed, M. Moinuddin: "Public Sector vs. private Sector? Jute & Jute Products", (BJMC).
4. Ahmed, Quazi Kholiquzzaman: "The Jute Manufacturing Industry of Bangladesh (1947-74)", Ph.D. Thesis, 1976, London School of Economics.
5. Ahmed, Rakibuddin: "The progress of the Jute Industry Trade (1855-1966)", Pakistan Central Jute Committee, Dacca, Nov., 1966.
6. Ahmed, Sadruddin: "A guide to Jute Technology", 1968.
7. Akhtar, Begum Hamida & Anwar, Md. Nurul: "Patterns of Leadership Behavior and Labour Productivity", Journal of Psychology, Vol. 7, University of Dacca.
8. Amey, L.R. (1964)
The Allocation and Utilization of Resources Operational Research Quarterly Vol. 15, No. 2, pp 87 - 100.
9. Andrews, Kenneth R: "The concept of Corporate Strategies", Taraporevala Publishing Industries (PVT) Ltd., Bombay, 1972.
10. Ascar, I.H. : "UNIDO-UNDP Report on BJMC", 1st Oct., 1978.
11. Bahiri, S. and Martin H.W. (1970).
Productivity Costing and Management
Management Int'l Review, Vol. 10, No. 1, pp 55 - 77.
12. Ball, R.J. (1968). The Use of Value Added in Measuring Managerial Efficiency, Business Ratios, Summer Vol. pp 3 - 9.
13. - : "Economic Trends", March 1979 and October 1979, Bangladesh Bank, Dacca.
14. - : "Selected Economic Indicators, Nov. 26, 1979" Bangladesh Bank, Dacca.

15. BJMC: "Production Efficiency for the month of March, 1979"
BJMC, Dacca.
16. BJMC: "Incentive Bonus Scheme for Jute Industry",
BJMC/AC/56.35.
17. BJMC: "Problems of Jute-Sector: As seen by BJMC", Dacca,
May 1978.
18. Bangladesh Planning Commission: "The Two Year Plan(Draft)
1978-80 " Dacca.
19. Bangladesh Planning Commission: "Bangladesh Economic Survey
1976-77", Dacca.
20. Measurement of Production and Productivity in Indian Industry.
London: Asia Publishing House, 1960.
21. BMDC., Dacca "To Study the System of Payment By Results in the
Industrial Sector of Bangladesh and Some Asian Countries"
Jan., 1981.
22. Bowery, AM and Lupton, T(1970) .
Productivity Drift and The Structure of the Pay Packet.
Journal of Management Studies Vol. 7, No. 2, pp. 156 - 71.
23. Centre For Inter firm Comparison (1968)
Accounts: Your Yardsticks of Performance ? .
24. Chia-Chu Hou, "Role of Productivity in Asian Economic Growth,
Asian Productivity Organization, 1970.
25. Chowdhury, A. Momin : "Some Personnel Problems of the Jute
Industry of Bangladesh", The Management Development
Vol. 7, No. 2, Oct. - Dec. 1978, Dacca.
26. Chowdhury, A. Momin : "Methods and Measures in Capability
Assessment and Performance Appraisal", Era Publishers,
Dacca, 1979.
27. Chowdhury, A. Momin : "Management: Philosophies, Theories,
Principles and Techniques" (under Publication),
Era Publishers, Dacca.
28. Cross, Bertram M. : "Organizations and their Managing",
Macmillan, London, 1964.

29. : "The Daily Ittefaq Dacca, July 7, 1979,
Sept. 13, 1979, Jan. 8, 1980.
30. - : "The Daily Bangladesh Observer", Dacca,
Aug. 5, 1978, Oct. 14, 1979, Oct. 21, 1979,
March 5, 1980.
31. - : "The Daily Bangladesh Times", Dacca,
Feb. 2, 1980, Feb. 29, 1980.
32. Easterfield, C.T.E. (1959)
Productivity Measurement in Great Britain,
D.S.I.R., U.K.
33. Eilen, Samuel, et al : "Applied Productivity Analysis
for Industry", Pergamon Int'l Library,
London, 1976.
34. Parrel, M.J. (1957).
The Measurement of Productive Efficiency
Journal of the Royal Statistical Society,
Series A, Vol. 120, Part III pp 253 - 90.
35. Goode, William J. and Hatt, Paul K. : "Methods in
Social Research", McGraw-Hill, 1952.
36. Gellerman, Saul W. : "Motivation and Productivity",
AMA, 1963.
37. Habibullah, M. "Motivation Mix", BER, University of
Dacca, 1974.
38. Habibullah, M. et al "A Study of Government Subsidy
to Jute Industry", Prepared for the Ministry of
Planning, Govt. of Bangladesh, (1980)
39. Habibullah, M. : "Industrial Efficiency and Profitability
in Bangladesh", Bureau of Economic Research,
University of Dacca, 1974.
40. Habibullah, M : "Some Aspects of Productivity in the Jute
Mills of Bangladesh", BER, University of Dacca.
41. Harvard Business School, "Harvard Business Review:
Motivation Series," 1970, Harvard, Mass.
42. Ichiru Nakayama: "An Introduction to Productivity",
APO, 1963.

43. Ichira Nakayama, : "Raisin Productivity", ILO, 1959.
44. Islam, Md. Saidul : "A Study on Organogram of the BJMC", June 1979, BMDC, Dacca.
45. Isujimura, Kotare: "The Measurement of Productivity," APO, 1963.
46. Kendrick, J.N. : Productivity Trends in the U.S. Princeton University Press, 1961.
47. Khan, Md. Moinuddin and Associates : "A study on Jute and Cotton Textiles", Jan. 1979, prepared for the Ministry of Planning, Govt. of Bangladesh.
48. Leabo, Dick A. : "Basic Statistics", Richard D. Irwin Inc., 1972.
49. Martin, H.W. : "Productivity Costing and Control Productivity Management Review OECD, Vol. 37, May, 1964, pp 12-76.
50. Martin, H.W. (1959), Towards a Common Measure of Productivity, Productivity Measurement Review. OEEC, Vol. 19, Nov. 1959, pp 5-30.
51. Miller, E. J. and Rice, A.K. : "Systems of Organization", Tavistock Publications Ltd., 1978.
52. Moser, C.A. : "Survey Methods in Social Investigation", Heinemann, London, 1958.
53. O'Shaughnessy, J. : "Business Organization", Allen & Unwin, London.
54. - : "Armitage and Nerton Report, June 1968", Pakistan Jute Mills Association, Dacca.
55. Peatman, John G. : "Introduction to Applied Statistics", Harper and Row, New York.
56. Powell, V.G.E. : "Initial Summary Report on M/S. Latif Bawany Jute Mills Ltd., Dacca."
57. Rice, A.K. : "The Enterprise and its Planning", Tavistock Publications, 1963.

58. Rice, A.K. : "Productivity and Social Organization: The Ahmedabad Experiment", Tavistock Publications Ltd., 1978. London.
59. Risk, J.M.S. (1965), Productivity Yardsticks/^{for} Management Accounting, U.K., Vol. 43, No. 11, pp. 381-91.
60. Robertson, E.J. (1968):
Productivity Bargaining and the Engineering Industry.
61. Rotas, L.
Alternative Productivity Concepts
Dissemination of Knowledge Series (APO),
No. 2.
62. Sectt, William G. : "Organization Theory",
Richard D, Irwin, 1937.
63. Siegel, I.H.
Concepts of Management of Production and
Productivity, Working Paper of the National
Conference on Productivity, Washington, 1952.
64. Spigel, Murray R. : "Theory and Problems of Statistics",
McGraw-Hill, N.Y., 1972.
65. Sutermeister, Robert A. : "People and Productivity",
McGraw-Hill Book Company.
66. Tiffin & McCormick: "Industrial Psychology",
PHI (Ind.) Pvt. Ltd.
67. Vito and others
Productivity Measurement in Italy (1963).
68. - : "The Weekly Begun". Dacca, Oct., 28, '979,

CONFIDENTIAL

A I P SURVEY QUESTIONNAIRE (8-rank)

Please do not write your name

1. Designation _____
2. Deptt./Section _____
3. Name of the Mill _____
4. Your Age, years _____
5. Education- (1) Below Matric (2) S.S.C. (3) H.S.C.
(4) Dip-in-Text./Jute Tech. (5) B.A./ B.Com./B.Sc.
(6) M.A./M.Com./M.Sc.(7) _____
6. Years of Service in Jute Industry _____
7. Salary per month Tk. _____
(a) Grade/Scale _____
8. Service Benefits (1) Housing (2) Medical for self
(3) Conveyance allowance or Transport (4) Medical for family
(4) Attendance Bonus (6) Performance Bonus (7) Bonus on Profit
(8) Yearly Bonus (9) Any other.
9. Agricultural Land, Bighas _____
10. No. of Dependents _____
11. Average Production per day, yds./lbs./mds./tor./pos.

a) By self _____ b) By deptt. supervised _____ c) By the Mills _____	Types of Products a) b) c) d)
--	---

12. a) No. of employees/workers directly under you _____
 b) Sum of salary/wage of people directly under you _____
13. Average Time (Hrs.) spent per day on
 a) Office work _____
 b) Job Instruction to people working under you _____
 c) Personal problems of people working under you _____
 d) Group problem (quarrels, complaints etc.) _____
 e) Problems with other Departments/Mills/Corporation _____
 f) Any other way (please specify) _____

N.B. While answering questions from (a) to (z).

Please make one choice, that you believe most from the following 8 beliefs:

Other things remaining as before,
 I believe, production in my department/Mill.

- 1) Will decrease considerably.
- or 2) Will not increase at all
- or 3) May increase or may not increase (doubtful)
- or 4) Will increase but slightly
- or 5) Will increase moderately
- or 6) Will increase much but less than double
- or 7) Will double
- or 8) Will be more than double.
- a) If workers are paid 50% higher wages (salary) per month
 (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- b) If workers are properly trained in their own job
(please tick the one, you believe most).

1 2 3 4 5 6 7 8

- c) If workers are given more facilities like housing, medical, rationing, transport and Cropping Expenses Compensation etc.
(please tick the one, you believe most).

1 2 3 4 5 6 7 8

- d) If workers are given more cash benefits such as bonuses etc.
(please tick the one, you believe most).

1 2 3 4 5 6 7 8

- e) If all management staff are given good management/supervisory training (please tick the one, you believe most).

1 1 3 4 5 6 7 8

- f) If all management staff are given more technical training
(relating to their own field) (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- g) If all management staff behave well with people working under them (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- h) If good works are praised and appreciated, by supervisors/incharges/managers/Corporation. (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- i) If regular maintenance of machineries are done. (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- j) If the working place is kept cleaner and cooler
(please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- k) If workers are asked and allowed to set their own production
target, (please tick the one you believe most).
- 1 2 3 4 5 6 7 8
- l) If the department heads are allowed to set the production
target of ^{their} department (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- m) If the mill-management are asked to set their own production
target (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- n) If efficient and experienced workers/employees have chance
for promotion to any higher post, upto the General Manager
(please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- o) If cost of living comes down to the pre-liberation level.
(please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- p) If workers are paid a bonus of 50% of their extra-production
made, (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- p¹) If all the members of any deptt. are given a bonus of 50% of
the extra-production made by that department (please tick the
one, you believe most).
- 1 2 3 4 5 6 7 8

- p²) If all the employees and workers of the mill are given a bonus of 50% of the extra-production (above target) made by the mill, as a whole (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- q) If supervisor spends all his working time, by the side of the workers, to supervise them (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- r) If labour-union/political parties do not create any pressure on workers and management (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- s) If all superiors give clear job instruction and a helping hand to all subordinates/workers. (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- t) If willfull absence for reasons other than medical, (i.e. absenteeism) may be minimized (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- u) If new machines replace old machines requiring overhauling/repairs at least once in every 3 months (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- v) If all jute mills are de-nationalised, (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- v¹) If only management becomes more efficient (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8
- v) If workers/sardars are represented in the meeting held by management, at all levels and are allowed to give their opinions in decision-making (please tick the one, you believe most).
- 1 2 3 4 5 6 7 8

- w) If better quality raw jute is supplied to the machines,
(please tick the one, you believe most).

1 2 3 4 5 6 7 8

- x) If mill-management is given full autonomy, in purchasing,
production selling, employment, promotion and discharge and
profit sharing, (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- y) If production control and quality control is done in all
mills at all times properly (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- z) If workers are required to work only 6 hours in a shift
(please tick the one, you believe most).

1 2 3 4 5 6 7 8

- z¹) If workers are paid by piece-rates or volume rates or weight
rate i.e. if wage is made piece-rate in general (abolishing,
time rate) (please tick the one, you believe most).

1 2 3 4 5 6 7 8

- z²) If total yearly leave is reduced by 20 days (please tick the one,
you believe most).

1 2 3 4 5 6 7 8

- z³) If children allowance upto a maximum number of 5 is given to
people working in the jute mills. (please tick the one, you believe
most).

1 2 3 4 5 6 7 8

CONFIDENTIAL

A I P SURVEY QUESTIONNAIRE (7-rank)

Please do not write your name.

1. Designation _____
2. Deptt./Section _____
3. Name of the Mill _____
4. Your Age, Years _____
5. Education - (1) Below Matric (2) S.S.C. (3) H.S.C.
(4) Dip-in-Text./Jute Tech. (5) B.A./B.Com/
B.Sc. (6) M.A./M.Com./ M.Sc. (7) _____
6. Years of Service in Jute Industry _____
7. Salary per month Tk. _____
a) Grade/Scale _____
8. Agricultural Land, Bighas _____
9. Service Benefits- (1) Housing (2) Medical for self
(3) Conveyance allowance or Transport
(4) Medical for family (5) Attendance Bonus
(6) Performance Bonus (7) Bonus on Profit
(8) Any other.
10. No. of Dependents _____
11. Average Production per day, yds/lbs/Mds/tons/lbs/.....
a) By self _____
b) By deptt. supervised _____
c) By the Mill _____
12. No. of employees/workers directly under you _____

13. Average Time (Hrs) spent per day on
- a) Office work _____
 - b) Job Instruction to people working under you _____
 - c) Personal problems of _____
 - d) Group problem (Quarrels, complaints etc.) _____
 - e) Problems with other Departments/Mills/Corps. _____
 - f) Any other way (please specify) _____

N.B. While answering questions from (a) to (z).

Please make one choice, that you believe most from the following 7 beliefs.

I believe, production in my department/Mill,

- 1) Will not increase at all
- or 2) May increase or may not increase(doubtful)
- or 3) Will increase but slightly
- or 4) Will increase moderately
- or 5) Will increase much but less than double
- or 6) Will double
- or 7) Will be more than double.

a) If workers are paid higher wages (salary) per month.
(please tick the one, you believe most).

1 2 3 4 5 6 7

b) If workers are properly trained
(please tick the one, you believe most).

1 2 3 4 5 6 7

- c) If workers are given more facilities/fringe benefits
(Please tick the one, you believe most).
- 1 1 3 4 5 6 7
- d) If workers are given more cash benefits such as bonuses etc.
(please tick the one, you believe most).
- 1 2 3 4 5 6 7
- e) If all management staff are given good management/ supervisory
training (please tick the one, you believe most).
- 1 2 3 4 5 6 7
- f) If all management staff are given more technical training
(relating to their own field) (please tick the one, you
believe most).
- 1 2 3 4 5 6 7
- g) If all management staff behave well with people working
under them (please tick the one, you believe most).
- 1 1 3 4 5 6 7
- h) If good works are praised and appreciated, by supervisors/
incharges/Corporation (please tick the one, you believe most).
- 1 2 3 4 5 6 7
- i) If regular maintenance of machineries are done,
(please tick the one, you believe most).
- 1 2 3 4 5 6 7
- j) If the working place is kept cleaner and cooler
(please tick the one, you believe most).
- 1 2 3 4 5 6 7
- k) If workers are asked and allowed to set their own
production target, (please tick the one, you believe most)
- 1 2 3 4 5 6 7

- l) If the department heads are allowed to the production target of his department (please tick the one, you believe most).

1 2 3 4 5 6 7

- m) If the mill-management are asked to set their own production target (please tick the one, you believe most).

1 2 3 4 5 6 7

- n) If efficient and experienced workers/employees have chances for promotion to any higher post, upto the General Manager (please tick the one, you believe most).

1 2 3 4 5 6 7

- o) If cost of living comes down to the pre-liberation level, (please tick the one, you believe most).

1 2 3 4 5 6 7

- p) If workers are paid a bonus of 50% of their extra-production made, (please tick the one, you believe most).

1 2 3 4 5 6 7

- p¹) If all the members of any department are given a bonus of 50% of the extra-production made by that department (please tick the one, you believe most).

1 2 3 4 5 6 7

- p²) If all the employees and workers of the mill are given a bonus of 50% of the extra-production (above target) made by the mill, as a whole (please tick the one, you believe most).

1 2 3 4 5 6 7

- q) If supervision becomes still closer (please tick the one, you believe most).

1 2 3 4 5 6 7

- r) If labour-union/political do not create any pressure on workers and management (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- s) If all superiors give clear job instructions and a helping hand to all subordinates/employees/workers (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- t) If willful absence for reasons other than medical, (i.e. absenteeism) minimized (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- u) If new machines replace old machines (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- v) If all jute mills are de-nationalised, (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- v¹) If present management becomes more efficient, (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- v²) If workers/sardars are represented in the meeting held by management at all levels (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- w) If good quality raw jute is supplied to the machines, (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
- x) If mill-management is given full autonomy, in purchasing, production selling, employment, promotion and discharge and profit sharing, (please tick the one, you believe most).
- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|

- 7) If production control and quality control is done properly (please tick the one, you believe most).

1 2 3 4 5 6 7

- 8) If workers are paid by piece rates or volume rates or weight rate i.e. if wage is made piece-rate in general (abolishing, time rate), (please tick the one, you believe most).

1 2 3 4 5 6 7

BIO- TA

- 1) Name : CHOWDHURY ABDUL MOMIN
(Surname)
- 2) Date & Place of birth : 6th Sept., 1937, at Noakhali
Bangladesh.
- 3) Present Occupation and Address : Senior Management Counsellor
Consultancy Services Division
Bangladesh Management Development
Centre, 4, Sobhanbag, Mirpur Road,
Dacca-7.

Phone No. 326086-90/310627

- 4) Duties and Responsibilities of the Post:
 - a) To conduct consultancy work, undertaken by the BMDC.
 - b) To design and conduct Special Management Programmes for various Organizations, asking for it.
 - c) To render auxilliary staff services to the Director, as and when asked for.
 - d) To give lectures in the regular, Diploma in Personnel Management Course, conducted by the BMDC.
 - e) To give lectures in different Management courses conducted by the BMDC.
 - f) To render active participation in the ILO-UNDP Project of National Management Development Programme.
 - g) To plan & co-ordinate the Productivity Services Programme for the Nationalised Industries of Bangladesh.
- 5) Project in hand.
Entrepreneurship Development Training Programme for Self-Employment of Educated Unemployed Youth. A National Project, sponsored by the Bangladesh Bank (started April, 1978).

6) Education

a) Matric Ist Division 1953, E.B.S.E. Board, Dacca.

b) B.Sc. 2nd Class 1957, University of Dacca.

c) Subjects: Physics, Chemistry, Mathematics.

d) Diplome d' Ingenieur(=M.S.) 1965, Ecole Nationale
Superieurs Du Petrole et des Moteurs, FRENCH
INSTITUTE OF PETROLEUM, FRANCE.

Subjects: Refining and Chemical Engineering
(Raffinage et Genie Chimique)

e) M.A. 1969 2nd Class, Karachi University, Karachi,
Pakistan.

Subjects : Economics

Choice : Managerial Economics.

f) AMBIM- elected in 1977, British Institute of Management,
U.D.

g) Diploma Ind. Admin., 1977, UNIV. of Geneva, (Int'l
Management School), Switzerland.

Subject: Int'l Management Development.

h) Ph.D. Student (U. of Dacca) 1977 -(Registration No.130-77/78).
"Measurement of Industrial Productivity and Incentives in
the context of Present Organizational Environment in the
Jute Industries of Bangladesh".

[a method of prediction of changes in the overall
productivity based on attitudes of workers and
management towards various incentives.]

7) Management Courses attended:

a) Three months course on General Management and
Statistics at the Institute of Business Administration,
University of Karachi.

b) Seminar on Industrial Relations, at the West Pakistan
Institute of Management, Karachi.

- c) ILQ National Seminar on Minimum Wages in Bangladesh.
- d) Seminar on Industrial Finance in Bangladesh.

8) Practical Trainings abroad:

- a) FRANCE: One months practical training in two French refineries-- Mobil Oil Franchasis and Gas du Lac during the regular course at FIP (June 1963 to Oct., 1963).
- b) JAPAN: (June 1968 to Nov., 1968). Practical training on Production Management, with M3S. Japan Storage Battery Co., KYOTO.

9) Professional Memberships:

- a) Alumnius, Center for Education in Int'l Management, Geneva.
- b) Member, Bangladesh Economic Association, Dacca.
- c) Member, Bangladesh Association of Scientists and Scientific Professionals, Dacca.
- d) Member, Association of Engineers, FIP, France.
- e) Member, Institute of Management Specialists, U.K.
- f) Associate Member, British Institute of Management, U.K.
- g) Member, Executive Committee, Bangladesh Institute of Project Management, Dacca.
- h) Associate Member, Institute of Personnel Management, Dacca.

10) Jobs completed in the present position:

- a) Complete Project layout for the National Productivity Council.
- b) To formulate and execute the Management Development Programme for M/S. Karin Rubber and Plastic Industries, Fatullah, Narayanganj.
- c) Manning with Job Description of Khulna Newsprint Mills Ltd.
- d) Management Development Programme of the Bangladesh Consumers Supplies Corporation.
- e) Management Study of Educational Administration in Bangladesh.

- f) Studies on Productivity in the Jute Industries. A case: Latif Bawany Jute Mills, Domra, Dacca.
 - g) Management Accounting and Information Systems in the Jute Industries of Bangladesh - A case: Latif Bawany Jute Mills, Domra, Dacca.
- 11) Industry/Organization Study Trips Abroad.
- a) FRANCE
 - i) Mobil Oil Francais
 - ii) Gas du Lac
 - iii) SNPA Complexes des Petro-Chemies
 - b) JAPAN
 - i) GS Storage Battery Factory at KYOTO and FUJISAMA.
 - ii) Honda Motor Cycle Plant
 - iii) Nippon Breweries(KIRAN BEER) Plant
 - iv) Nippan Textiles, near KYOTO
 - v) Japan Separators Ltd., near Kyto.
 - c) THAILAND
 - i) SIAM MOTORS(TOYOTA PLANT)
 - ii) SIAMO BATTERIES.
 - d) USSR.
 - i) Mens Clothing Industry, Moscow.
 - ii) GOSPLAN
 - iii) Foreign Trade Organization.
 - iv) COMECON
 - v) Ministry of Controls
 - vi) Ministry of Science and Technology.

o) SWITZE AND

- i) CIBA-GEIGY COMPLEX, BASEL
- ii) GALENICA S.A. (Computered Distribution and Inventory Controls).
- iii) European Atomic Energy Centre, GENEVA.
- iv) NUCLEAR POWER PLANT, BARN.

i) IRAN.

- i) National Petro Chemical Co.
- ii) VOLVO ASSEMBLY PLANT
- iii) CENTRAL BANK OF IRAN
- iv) IRAN GERMAN SHOE MANUFACTURING COMPLEX.

g) EGYPT

- i) Ministry of Planning
- ii) Ministry of Education

h) THE PHILIPPINES

- i) M/S. Ralph Philippines, Manila.
- ii) Cottage Ind. Dev. Authority Marketing Organization(MACIDA), Manila.
- iii) The Institute for Small Scale Industries, Manila.

12) Fluency in Languages:

ENGLISH, FRENCH, URDU, HINDI, ARABIC AND BENGALI.

13) Employment Record:

A. From	To	Post holding	Present Basic Pay
May 1974.	date	Senior Management Counsellor.	Tk. 2075/- per month.

Employer and his address

The Director.
The Bangladesh Management Development Centre
4, Sobhanbag, Mirpur Road, Dacca-7.

Duties and Responsibilities:

1. To conduct consultancy works, undertaken by the BMDC.
2. To render auxiliary staff services to the Director as and when asked for.
3. To give lectures in the regular, Diploma in Personnel Management course, conducted by the BMDC.
4. To give lectures in different Management courses conducted for time to time, by the BMDC.

B.	From	To	Post held	Last Pay drawn
	July 1973	May, 1974.	MANAGER	Tk. 1300/ p.m.

Employer and his address:

The Mitali Industries Ltd.
Chittagong, Bangladesh.

Duties and Responsibilities:

- 1) To run the entire business of the Company (Planning, Production, Marketing, Sales and Accounting etc.) Independently.
- 2) To assist the Board of Directors in setting the Company strategy, objectives and policies.
- 3) To make reports for the shareholders, to be presented in the annual general meeting.

C.	From	To	Post hold	Last pay Drawn
	Dec., 1970	June, 1973	Professor	Tk. 600/-
				(Stop-Gap arrangement after coming from West Pakistan.)

Employer and his address:

The Lakshnipur (Degree College)
Noakhali, Bangladesh.

Duties and Responsibilities:

1. To teach Macro-economics in Degree Classes.
2. To teach Management in B.Com. Classes.
3. To teach Money and Banking in H.S.C. Classes.

D.	From	To	Post hold	Last Pay drawn
	June, 1968	Sept., 1970	Senior Chemical Engineer and Production Controller.	Tk. 1300/-

Employer and his address:

The Atlas Battery Ltd.
181- DSITE, Karachi
Pakistan.

Duties and Responsibilities:

1. Production Planning and Quality Control.
2. Factory Management.
3. Product Development.

E. From	To	Post held	Last Pay Drawn
Aug., 1957	May, 1968	Research Officer Research Engineer.	Tk. 980/- p.m.

Employer and his address:

The Pakistan Council of Scientific and
Industrial Research Karachi, Pakistan.

Duties and Responsibilities:

1. Incharge, Central Workshop.
2. Incharge, Pilot Plant Section.
3. Assistance in Pure and Applied Research.

Part-Time Employment.

Session 1966- 1967	Honorarium Received
	Rs. 100/- per hour.

Teacher of Chemical Engineering at the Dawood
College of Engineering and Technology, Karachi,
Pakistan.

Subjects taught: 1) Unit Operations.

2) Heat Transfer.

14. Publications:

- a) i) Book on Management: "Methods and Measures in Capability Assessment and Performance Appraisal in Commerce, Industry and Government" Sept., 6, 1979.
ERA PUBLISHERS, DACCA-7.
- ii) "The Entrepreneur's Success in Business and Industry" (In Bengali), Dec., 25, 1980.
ERA PUBLISHERS, DACCA-7.

b) MBA Thesis:

" A Study into the Determinants of Minimum Cash Level of Firm
Published from the Centre for Education In Int'l
Management, University of Geneva, In May, 1977.

- c) Standard Text Materials on various management functions.
- d) Laboratory Manual on Unit Operation and Heat Transfer--
Published in July, 1966, from the Deptt. of Chemical and
Technology, University of Karachi, Pakistan.

e) Articles on Bangladesh Economy:

- i) The Creation of A Social Framework for Population Control in Bangladesh- Aug., 1, 1975, The Bangladesh Times.
- ii) The Rationale of Manpower Planning in Bangladesh-
Part I- Prospect of Food and Employment, 1999.
- Vol. 5, No. 1, 1976, The Management Development, Dacca.
- iii) The Rationale of Manpower Planning in Bangladesh-
Part-II. The Desired Family-size and Population.
-Vol.5, No. 2, 1976, The Management Development, Dacca.

f) Articles on Management:

- i) "Techniques of Basing Organizational Efficiency"
- Vol. 6, No. 4, 1977, The Management Development,
Dacca.
- ii) "Some Personnel Problems of the Jute Industry"
- Vol. 7, No. 4, 1978, The Management Development,
Dacca.

g) Books under Publication:

- i) "Management : Philosophies, Theories, Principles and
Techniques".

ERA PUBLISHERS, DACCA-7.

RARE BOOK