

CHAPTER 4
METHODOLOGY

Bangladesh Sugar and Food Industries Corporation (BSFIC) is a state owned Enterprise. The Enterprise contributes significantly to national production, employment generation and revenue collection of the government, although various reform programmes including privatization are under way in the changing economic environment. There are 17 sugar mills and 6 other organizations with about 22000 man power strength under the BSFIC.

**Table 2 : Bangladesh Sugar and Food Industries Corporation
Manpower Profile (Year 1996-97)**

Description	Permanent			Seasonal		Total
	Officer	Staff	Worker	Staff	Worker	
Sugar Mills	1187	6962	3045	5107	3519	20854
Engineering Factory	17	91	161	-	20	289
BSFIC Head Office and Shipping Office	269	282	-	-	-	551
Total	1413	7335	3706	5701	3539	21694

Source : Annual Report (1996 – 97), BSFIC.

Employees from 5 (five) sugar mills were selected for the present study. The selected sugar mills are as under :

1. Syampur Sugar Mills Limited. (SSML)
2. Rajshahi Sugar Mills Limited. (RASML)
3. Natore Sugar Mills Limited. (NSML)
4. Rangpur Sugar Mills Limited. (RSML) and
5. Joypurhat Sugar Mills Limited. (JSML)

The entire plan of the present study is related with the proposition that :

1. There is a gap between the existing and expected QWL among the sugar mill employees.
2. There are significant differences among hierarchical levels with respect to perception of QWL.
3. There is a definite effect of QWL on group (departments) cohesiveness.

4.1.1 Economic Profile of Bangladesh

A brief sketch of economic profile of Bangladesh is very much relevant before going for specific methods applied in this study. Economic environment influences quality of work life directly and indirectly and also relates quality of life. Some economic data are presented in the following tables.

Table 3 : General Census (1991) of Bangladesh

Population (million), March, 1991	111.40
Population Growth rate (%), 1991	2.17
Urban-(% of total population)	20.00
Population (million), January, 2000	130.20
Population Growth rate (%), 2000	1.50
Land Area (sq. km)	147570.00

Table 4 : Vital Statistics of Bangladesh

Crude Birth Rate (per 1000 Population), 1999		23.60
Crude Death Rate (per 1000 Population), 1999		8.00
Infant Mortality Rate (per 1000 live birth), 1999 (less than one year)		66.00
Total Fertility Rate (per woman), 1998		3.60
Contraceptive Prevalence Rate (%), 1998		51.50
Life Expectancy at Birth, 1999	Male :	60.80
	Female :	59.60

Table 5 : Health and Social Services of Bangladesh

Person per Hospital Bed, 1999	4251.00
Person per Physician, 1999	4599.00
Mean Age at first Marriage (woman), 1998	20.20
Access of Safe Drinking Water, 1998 (% household)	96.20
Access of Hygienic Toilet, 1998 (% household)	51.50
Adult Literacy Rate (15 years +) (%), 2000 (provisional)	60.00

Table 6 : Employment and Labour Force of Bangladesh (Labour Force Survey, 1995/96)

Civilian Labour Force (million)	56.00
Male	35.00
Female	21.00
<u>As percentage of total Labour Force</u>	
Agricultural Labour Force	63.20
Industrial Labour Force	7.70
Other Labour Force	29.10

Table 7 : Income Distribution and Poverty (%), (1995/96)

(Less than 2122 k. cal/ day per person)	
Urban	49.70
Rural	47.10
(Less than 1805 k. cal/ day per person)	
Urban	27.30
Rural	24.60

Table 8 : Gross Domestic Product, 1999/ 2000 (Provisional)

GDP at current prices (billion Taka)	2412.74
GDP at current prices (billion Taka) (1995/96 = 100)	2040.20
GDP Growth Rate at constant prices (%)	5.50

Table 9 : Savings and Investment (1999/ 2000) (as percent of GDP)

Domestic Savings	17.78
National Savings	22.60
Gross Investment	22.41
Public Investment	6.73
Private Investment	15.68

Table 10 : Trade Balance (1999/ 2000) (based on Provisional and Target)

Value of Export (million US\$)	5738.00
Value of Import (million US\$)	Not Targeted
Export (% of GDP)	11.82
Import (% of GDP)	----
Export Income (July, 1999 – March, 2000), (million US\$)	4125.00
Import Expenses (July, 1999 – December, 1999), (million US\$)	3884.00
Foreign Currency Reserve (04-05-2000), (million US\$)	1622.00
Remittances (July, 1999 – March, 2000), (million US\$)	1393.00

Table 11 : Government Finance (% GDP) 1999/ 2000, (Provisional)

Total Expenditure	14.99
Total Revenue-	10.01
Overall Deficit	4.98

Source : Bangladesh Economic Review, 2000.

4.1.2 Economic Overview

Bangladesh emerged as an independent country on March 26, 1971. The war of liberation ended on 16 December, 1971 in victory of Bangladesh. Bangladesh is an Asian country with a population of 130.2 million and a growth rate of 1.5 (2000). In this country, literacy rate is 60% (2000), population density 882 per sq. km, total work force 43.7% of total population of which 62.5% male and 37.5% female (Labour force survey, 1995/96). The labour force survey, 1995/96 shows that about 40.1% were unpaid family workers, 17.9% were day labour, 12.4% were regularly employed workers and 29.6% were self-employed/employer's own

account. A large segment of the labour force thus remains outside the organized labour market and wage labour system.

Nominal wage rate indices for the period between 1989/90 and 2000 (upto February, 2000) are shown in the following Table-12. The nominal wage rate index registered an increase of 7.6% in 1997/98 compared to the earlier years which was the highest during the last 8 years. Real wage rate index was 122 in 1997/98.

Table 12 : Wage Rate Indices (Base Year 1985/86 = 100)

Year	Wage Index (Nominal)	Change in Percent	CPI of Industrial Workers (Nominal)	Wage Index (Real)
1989/90	1426	10.7	1301	110
1990/91	1482	3.9	1386	107
1991/92	1553	4.8	1448	107
1992/93	1638	5.5	1449	113
1993/94	1709	4.3	1506	114
1994/95	1786	4.5	1610	111
1995/96	1900	6.4	1674	114
1996/97	1990	4.7	1663	120
1997/98	2141	7.6	1748	122
1998/99	2259	5.5	1921	118
1999/2000 (upto February, 2000)	2373	6.1	1968	120

Source : a) Bangladesh Bureau of Statistics.
b) Bangladesh Economy Review 2000.

Note : Nominal Index is the average of indices of 4 centres viz., Dhaka, Chittagong, Rajshahi and Khulna. The CPI is the average of the consumer price indices of industrial workers of Narayanganj, Chittagong and Khulna.

CPI = Consumer Price Indices.

Some other economic data and Bangladesh's ranking in the world are presented in the following Table-13.

Table 13 : Size of the Economy of Bangladesh and Rank in the World.

Items	World	Bangladesh	Bangladesh's Rank
Population (millions, 1998)	5,897 s	126	8
Surface Area (Thousands of sq. km), 1996	133,567 s	144	96
Population Density (People per sq. km), 1998	45 w	875	-
<u>Gross National Product (GNP)</u>			
Billions of dollars 1998 ^b	28,862.2 t	44.0	52
Average Annual Growth Rate (%), 1997-98	1.5 w	5.0	-
<u>GNP per Capita</u>			
Dollars 1998 ^b	4890 t	350	175
Average Annual Growth Rate (%), 1997-98	0.1 w	3.4	-

Source : Entering the 21st Century World Development Report 1999/2000.

- Note :
- b. preliminary World Bank estimates calculated using the World Bank *Atlas* method.
 - s. denotes totals where missing values are not imputed.
 - t. denotes totals where missing values are imputed.
 - w. denotes aggregates of ratios are generally calculated as weighted averages of the ratio.

4.2 QWL in the Bangladesh Context

The concept 'Quality Work life' appeared in journal only in 1970 in United States of America. Now QWL is not only monetary aspect towards the employee, it is concerned with conditions of employment, interpersonal and role conflicts in the organization, freedom of work and decision, challenging work avenues in the organization, scope of career development and finally work humanization.

The employees of the sugar mills have a tendency to stick on to the old. The employers and management hesitate to spend a considerable amount for improving quality of work life. Trade unions are mostly involved to increase their salary and wages. Management, employees and government are, however, generally realizing the importance of QWL. In fact QWL improvement was not considered as important factor in Bangladesh. Because there were more impending factors like serious financial problem, resource deficiency, political unrest, environmental threats, trade union activities, lack of consciousness among employees in this regard can be considered the reasons for delayed improvement of QWL. Now management, government and employees are taking initiatives to improve industrial environment from the viewpoint of economic, social and political for greater prosperity and productivity. The government of Bangladesh has put in place a comprehensive array of policies aimed at bringing about significant socio-economic improvement.

There are also differences among the views of management regarding QWL. Some have realized human resources as a critical one in the developmental process and trying to take all possible steps to improve it. But still many organizations do not realize the importance of human resources. This is so in industries with backward status. Whereas multinational industries are fast realizing the need for improvement of QWL.

Now, at this stage it is important to develop consciousness among all sections of industry i.e., workers, unions and management about QWL with a positive approach. Because a positive relationship between QWL and worker's satisfaction is almost already established. Hossain and Islam (1999) found that there is significant positive correlation between QWL and job satisfaction.

In Bangladesh, we have a vast work force that is largely unorganized. Now there is a need to consider what can be done for them in terms of improving their quality of work life and quality of life. To many a mind the concern for improving quality of

work life in Bangladesh context may be marginal. After all approximately 63% of its work force out of total employable population 56.0 million are working in agricultural sector.

Civilian labour force as estimated in Labour Force Survey, 1995/96, is 56.0 million of which male constitutes 35.0 million and female 21.0 million. Agriculture still employs the highest number of labour (63.27%). The Labour Force Survey, 1995/96 shows that about 40.1% were unpaid family workers 17.9% were day labour, 12.4% were regularly employed workers and 29.6% were self employed/ employer's own account. A large segment of the labour force thus remains outside the organized labour market and wage labour system.

Table 14 : Share of Employed Labour Force by Industry, 1995/96 (%).

Sector	1995/96
Agriculture, Forestry and Fisheries	63.2
Mining and Quarrying	-
Manufacturing	7.5
Electricity, Gas and Water	0.2
Construction	1.8
Trade, Hotel and Restaurants	11.2
Transport, Storage and Communication	4.2
Finance, Business and Service	0.4
Community and Personal Services	9.3
Others	2.2
Total	100.0

Source : a). BBS Labour Force Survey, 1995/96.
b). Bangladesh Economic Review, 2000.

Job creation is a very important issue in Bangladesh. Because a large number of educated unemployed persons are waiting for jobs of whatever quality, just to earn a respectable living. But it is also important issue for greater productivity and prosperity to improve QWL for those already employed in different organizations and industries. There are roles to be played by government and by industry. Both have to work in a joint interface to improve the quality of work life and productivity (Srinivasan, 1991: p. 4).

Dissatisfaction among workers against job, monotonous and lack of responsibility, low productivity, strains of fast changing technology, employees control over jobs have made concern for improving quality of work life now a reality in Bangladesh.

Now, scholars, managers, administrators, government and behavioural scientists are giving attention on QWL for better work environment and productivity, national development and prosperity and finally work satisfaction and better life.

In a developing economy, any country in the third world, the term 'Quality of Work Life' covers a much broader sense than just being related to the workers' satisfaction at their work place, or their participation in job related decisions (Ghosh, 1991). He further noted that low production or stagnant is the reality of the third world. In this situation many industries face a serious limit to the payment of fair pay for their employees. Quality of Work Life depends on the adequacy of the compensation for work and facilities for safety and health. It is fact that the improvement of quality of work life significantly depends on productivity.

4.3 The Five Sugar Mills in the Sample

The present study was conducted to measure overall existing quality of work life and expected quality of work life, the differences among the hierarchical levels across and between the department in perceiving quality of work life and the effect

of quality of work life on group behaviour of five sugar mills in Rajshahi Division. For this study 5 (five) sugar mills were selected out of 17 (seventeen) sugar mills, working under Bangladesh Sugar and Food Industries Corporation (BSFIC). The selected sugar mills were :

1. Syampur Sugar Mills Limited. (SSML)
2. Rajshahi Sugar Mills Limited. (RASML)
3. Natore Sugar Mills Limited. (NSML)
4. Rangpur Sugar Mills Limited. (RSML) and
5. Joypurhat Sugar Mills Limited. (JSML)

All the five sugar mills are nationalized organizations. The following are the brief descriptions of the five sugar mills selected for the study.

1. **Syampur Sugar Mills Limited**

Syampur Sugar Mills Limited is the lone sugar mill in Rangpur District. It is situated at Syampur, 20 km west of Rangpur Town.

1. Name of Sugar Mill	:	Syampur Sugar Mills Limited.
2. Year of Installation	:	1964
3. Year of the 1 st Commercial Production	:	1967-68
4. Name of the Machinery Suppliers	:	Mitsubisi Co. Ltd. Japan.
5. Annual Production Capacity	:	10,162 M.T.
6. Present Grinding Capacity	:	1,016 M.T. (Daily)
7. Area (ha)	:	40.09
a) Factory and Office	:	8.30
b) Colony	:	14.17
c) Experimental farm	:	10.94
d) Pond and Railway siding	:	6.68

About 33% employees of the mill had accommodation facilities within the mill area. The workers had a recognized union. Employees had recreation facilities like canteen and clubs. The mill authority provided limited transport facilities for their

employees. The mill authority also provided medical facilities to its employees and education facilities for their employees' children. The manpower was 1052.

2. Rajshahi Sugar Mills Limited

Rajshahi Sugar Mills Limited is situated at Hariari 12 km east of Rajshahi town.

1. Name of Sugar Mill	: Rajshahi Sugar Mills Limited.
2. Year of Installation	: 1962-65
3. Year of the 1 st Commercial Production	: 1965-66
4. Name of the Machinery Suppliers	: Mirrlees and Watson Co. Ltd. Glasgow, Scotland.
5. Annual Production Capacity	: 20,000 M.T.
6. Present Grinding Capacity	: 2,000 M.T. (Daily)
7. Area (ha)	: 92.91
a) Factory and Office	: 8.30
b) Colony	: 14.42
c) Experimental farm	: 48.95
d) Sugar cane purchasing centre	: 21.23

About 23% employees of the mill had accommodation facilities within the mill area. So majority of the employees used to reside in the nearby villages and in Rajshahi town. The workers had two recognized unions. The employees had recreation clubs and canteen. The mill authority provided transport facilities for those coming from the town. The mill authority also provided medical facilities to its employees and school facilities for its employees' children. The number of working employees was 1834.

3. Natore Sugar Mills Limited

Natore Sugar Mills Limited is situated near Natore District town. It is relatively new organization. About 29% employees had accommodation facilities arranged by the mill authority in an area adjoining the mill. They also had recreation facilities like canteen and clubs. The mill authority provided medical facilities to its employees and education facilities to its employees' children. The mill authority also maintained limited transport facilities for its employees. A number of 1353 employees were working at the mill.

1. Name of Sugar Mill	: Natore Sugar Mills Limited.
2. Year of Installation	: 1982
3. Year of the 1 st Commercial Production	: 1984-85
4. Name of the Machinery Suppliers	: Heavy Mechanical Complex, Thkasila, Pakistan.
5. Annual Production Capacity	: 15,000 M.T.
6. Present Grinding Capacity	: 1,500 M.T. (Daily)
7. Area (ha)	: 38.99
a) Factory and Colony	: 29.59
b) Farm and Sugar cane purchasing centre	: 9.40

4. Rangpur Sugar Mills Limited

Rangpur Sugar Mills Limited is an old organization in terms of the establishment. The mill is situated at Mohimagonj in the Gaibandha District. About 22% employees used to reside in the residential flats provided by the mill authority. The workers were members of a union recognized by the mill authority. Employees had recreation facilities like canteen and clubs. The mill authority provided medical

facilities to its employees and school facilities to its employees' children. The mill authority also provided transport facilities to its employees in a limited scope. The number of working employees was 1161.

1. Name of Sugar Mill	:	Rangpur Sugar Mills Limited.
2. Year of Installation	:	1954-55
3. Year of the 1 st Commercial Production	:	1957-58
4. Name of the Machinery Suppliers	:	Bucku – Wolf, Germany.
5. Annual Production Capacity	:	15,000 M.T.
6. Present Grinding Capacity	:	1,500 M.T. (Daily)
7. Area (ha)	:	779.98
a) Factory and Office	:	12.41
b) Farm	:	742.07
c) Colony	:	14.41
d) Sugar cane purchasing centre	:	6.03
e) Railway siding	:	3.30
f) Unused land	:	1.77

5. Joypurhat Sugar Mills Limited

Joypurhat Sugar Mills Limited is quite a big organization in terms of production capacity. The mill is situated near to the district town of Joypurhat. About 25% employees had accommodation facilities arranged by the mill authority in mill compound. The workers had their recognized unions. They had recreation facilities like canteen and clubs. The mill authority provided medical facilities for its employees and education facilities for its employees' children. The mill authority

also provided transport facilities for its employees in a limited scope. A number of 1609 employees were working at the mill.

1. Name of Sugar Mill	:	Joypurhat Sugar Mills Limited.
2. Year of Installation	:	1960
3. Year of the 1 st Commercial Production	:	1962-63
4. Name of the Machinery Suppliers	:	Stork Werks Poor, Holland.
5. Annual Production Capacity	:	20,320 M.T.
6. Present Grinding Capacity	:	2,032 M.T. (Daily)
7. Area (ha)	:	76.49
a) Factory and Office	:	4.72
b) Experimental farm	:	32.80
c) Colony	:	7.29
d) Road and Railway siding	:	6.08
e) Factory premise	:	18.58
f) Mosque, School, Hospital, Field	:	2.97
g) Pond and Unused land	:	4.05

Table 15 : Manpower Profile of Selected 5 (five) Sugar Mills (Year 1998-99)

Selected Sugar Mills	Permanent			Seasonal		Total
	Officer	Staff	Worker	Staff	Worker	
1. Syampur Sugar Mills Limited (SSML)	43	292	175	365	177	1052
2. Rajshahi Sugar Mills Limited (RASML)	115	600	262	551	306	1834
3. Natore Sugar Mills Limited (NSML)	64	415	192	480	202	1353
4. Rangpur Sugar Mills Limited (RSML)	73	374	209	332	173	1161
5. Joypurhat Sugar Mills Limited (JSML)	61	548	260	504	236	1609
Total	356	2229	1098	2232	1094	7009

Source : a) Annual Work Performance Report (1998-99), SSML.

b) Annual Work Performance Report (1998-99), RASML.

c) Annual Work Performance Report (1998-99), NSML.

d) Annual Work Performance Report (1998-99), RSML.

e) Annual Work Performance Report (1998-99), JSML.

Exhibit 1: Organogram of Sugar Mills Working Under Bangladesh Sugar and Food Industries Corporation (BSFIC)

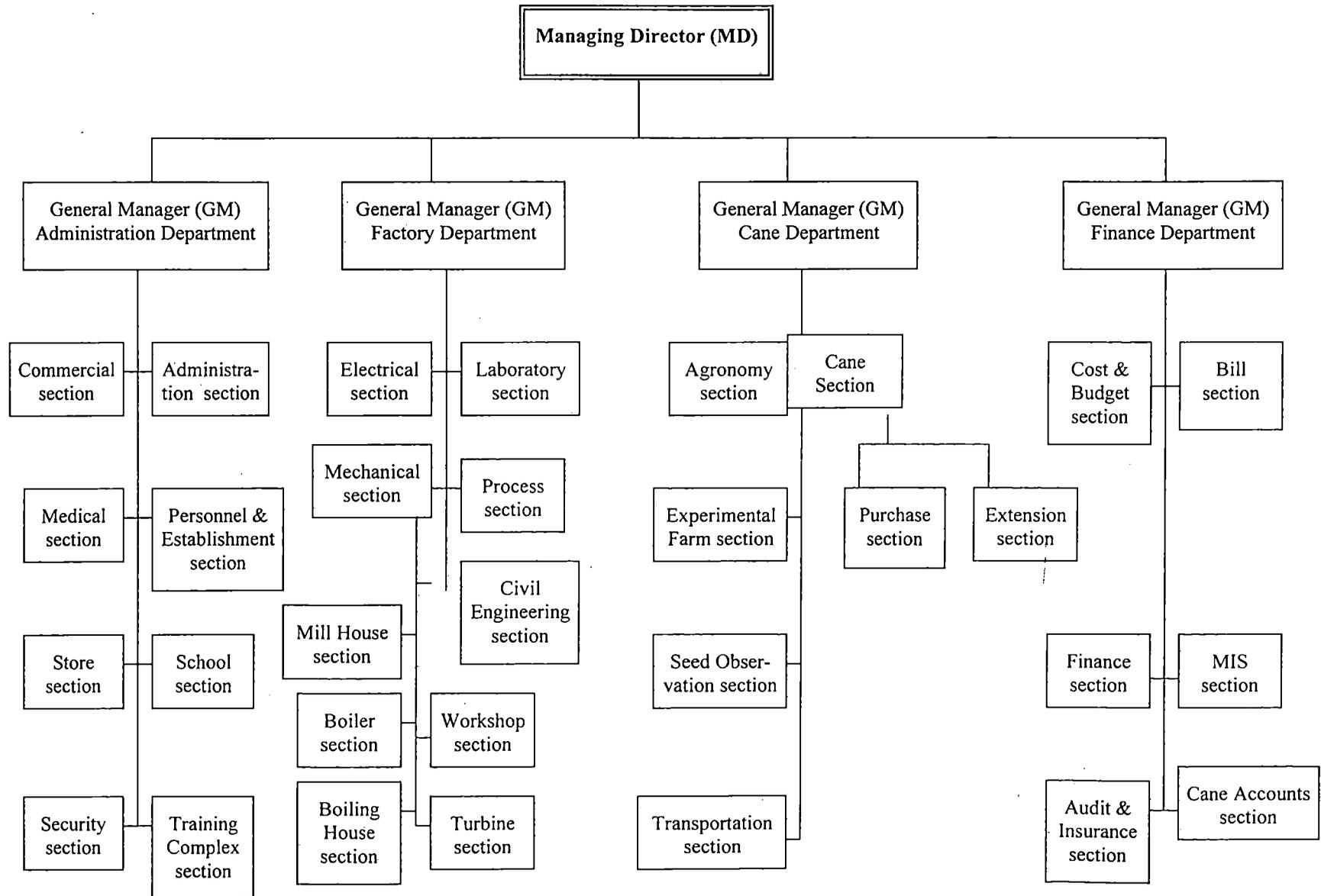


Table 16 : Financial Profile of 5 (five) Selected Sugar Mills

Selected Sugar Mills	Net Sales 1997-98 (Taka in Lac.)	Profit/ Loss 1997-98 (Taka in Lac.)	Asset size in 1997 (Taka in Lac.)
1. SSML	2022.84	(-) 321.46	2075.57
2. RASML	3928.73	(-)850.69	5302.71
3. NSML	4142.20	206.09	4750.14
4. RSML	2087.54	(-) 684.85	2359.49
5. JSML	3929.90	(-) 166.98	1418.91

Source : a) Annual Report (1996-97), BSFIC.
b) Annual Work Performance Report (1998-99) of Selected Sugar Mills.
c) Bangladesh Economic Review 2000.

4.4 The Sample

For this study, the sample size is 1000 employees out of 7009 employees (representing about 15% of the total manpower strength) working in the selected 5 sugar mills. In selecting sample stratified and random sampling techniques were used. It may be mentioned here that the selected samples were termed as *subject* throughout the entire presentation. Using *proportional allocation method*, the sample sizes of different selected sugar mills are as under:

Table 17 : Distribution of Sample Employee–Mill wise.

Name of the selected Sugar Mills	Employees (Sample Sizes)	Percentage
1. Syampur Sugar Mills Limited (SSML)	150	15%
2. Rajshahi Sugar Mills Limited (RASML)	262	26.2%
3. Natore Sugar Mills Limited (NSML)	193	19.3%
4. Rangpur Sugar Mills Limited (RSML)	166	16.6%
5. Joypurhat Sugar Mills Limited (JSML)	229	22.9%
Total	1000	100%

Table 18 : Sample Distribution for Hypotheses According to Stratified Sampling Technique.

Name of the Selected Sugar Mills	H ₁ & H ₂	H ₃	H ₄	Total
	N	N	N	N
1. Syampur Sugar Mills Limited (SSML)	22	98	30	150
2. Rajshahi Sugar Mills Limited (RASML)	40	170	52	262
3. Natore Sugar Mills Limited (NSML)	29	125	39	193
4. Rangpur Sugar Mills Limited (RSML)	25	108	33	166
5. Joypurhat Sugar Mills Limited (JSML)	34	149	46	229
Total	150	650	200	1000

H₁ = Hypothesis one, H₂ = Hypothesis two, H₃ = Hypothesis three,

H₄ = Hypothesis four, N = Number.

Sample for Hypotheses One and Two (H₁ & H₂)

Employees of the five sugar mills (Syampur Sugar Mills Limited, Rajshahi Sugar Mills Limited, Natore Sugar Mills Limited, Rangpur Sugar Mills Limited and Joypurhat Sugar Mills Limited) were considered for hypotheses one and two. Table-19 shows that a number of 22 employees from Syampur Sugar Mills Limited, 40 employees from Rajshahi Sugar Mills Limited, 29 employees from Natore Sugar Mills Limited, 25 employees from Rangpur Sugar Mills Limited and 34 employees from Joypurhat Sugar Mills Limited have sampled out for hypotheses one and two. So, 150 employees from different levels sampled out of the five sugar mills served as subjects for the study undertaken for hypotheses one and two (H₁ & H₂).

All the 22 sampled employees of Syampur Sugar Mills Limited were of ages ranging from 30 to 55 years (the mean age was 44.55 years). Their education ranged from class III level to Masters—the mean education being class XI level. Their mean experience and income per month were 20.09 years and Taka 5425.50 respectively. All the employees were married and male.

Table 19 : Demographic Variables of Employees for Hypotheses One and Two (H_1 and H_2).

Name of Sugar Mills	Age (years)		Education (level)		Experience (years)	Income per month (Taka)	Marital Status (percent)		Sex (percent)	
	Range	Mean	Range	Mean	Mean	Mean	Married	Unmarried	Male	Female
SSML n=22	30-55	44.55	III-Masters	XI	20.09	5425.50	100%	-	100%	-
RASML n=40	34-56	42.80	III-Masters	X	19.98	5317.00	100%	-	100%	-
NSML n=29	28-53	39.83	VIII-Masters	XII	15.69	5129.14	96.55%	3.45%	100%	-
RSML n=25	35-54	43.16	III-Masters	XI	18.68	5550.60	100%	-	96%	4%
JSML n=34	32-55	42.29	I-Masters	IX	19.68	5288.38	100%	-	100%	-

All the 40 sampled employees of Rajshahi Sugar Mills Ltd. were of ages ranging from 34 to 56 years (the mean age was 42.80 years). Their education ranged from class III level to Masters—the mean education being class X level. Their mean experience and income per month were 19.98 years and Taka 5317.00 respectively. All the employees were married and male.

The whole of sample of 29 employees of Natore Sugar Mills Ltd. were of ages ranging from 28 to 53 years (the mean age was 39.83 years). The education of the employees ranged from class VIII level to Masters—the mean education being class XII level. Their mean experience and income per month were 15.69 years

and Taka 5129.14 respectively. All the employees were married except one and all the employees were male.

All the 25 sampled employees of Rangpur Sugar Mills Ltd. were of ages ranging from 35 to 54 years (the mean age was 43.16 years). Their education ranged from class III level to Masters—the mean education being class XI level. Their mean experience and income per month were 18.68 years and Taka 5550.60 respectively. All the employees were married and only one employee was female.

The whole sample of 34 employees of Joypurhat Sugar Mills Ltd. were of ages ranging from 32–55 years (the mean age was 42.29 years). Their education ranged from class I level to Masters—the mean education being class IX level. Their mean experience and income per month were 19.68 years and Taka 5288.38 respectively. All the employees were married and male.

Table 20 : Distribution of Sample for Hypotheses One and Two (H_1 & H_2) According to the Designations.

Name of Sugar Mills	Officer	Supervisor	Staff	Worker	Total
SSML	5	4	8	5	22
RASML	7	6	14	13	40
NSML	5	5	11	8	29
RSML	5	4	9	7	25
JSML	6	6	9	13	34
Total	28	25	51	46	150

Table-20 shows a number of 28 officers, 25 supervisors, 51 staffs and 46 workers from the selected five sugar mills were sampled out for hypotheses one and two (H_1 and H_2).

Exhibit 2 : Distribution of Sample Categories for all 5 Sugar Mills for Hypotheses One & Two

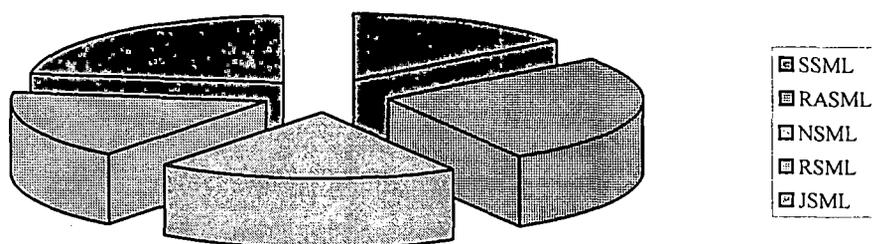


Table 21 : Demographic Variables of Employees According to Designations for Hypotheses One and Two (H_1 and H_2).

Designations	Age (years)		Education (level)		Experience (years)	Income per month (Taka)	Marital Status (percent)		Sex (percent)	
	Range	Mean	Range	Mean	Mean	Mean	Married	Unmarried	Male	Female
Officer n=28	36-55	46.29	Graduate-Masters	XV	18.50	10436.29	96.43%	3.57%	100%	-
Supervisor n=25	35-56	46.08	VIII-Masters	XII	20.80	5655.60	100%	-	100%	-
Staff n=51	28-53	39.04	I-Masters	X	16.16	3768.63	100%	-	98.04%	1.96%
Worker n=46	32-55	42.35	II-Graduate	VIII	20.37	3326.09	100%	-	100%	-

Table-21 shows the sampled officers, supervisors, staffs and workers – mean age (years), mean education level, mean experience (years), mean income per month (Taka), marital status and sex respectively.

Sample for Hypothesis Three (H₃)

The study was conducted in the administration, cane, factory and finance departments of the five sugar industry, viz., Syampur Sugar Mills Ltd., Rajshahi Sugar Mills Ltd., Natore Sugar Mills Ltd., Rangpur Sugar Mills Ltd. and Joypurhat Sugar Mills Ltd.

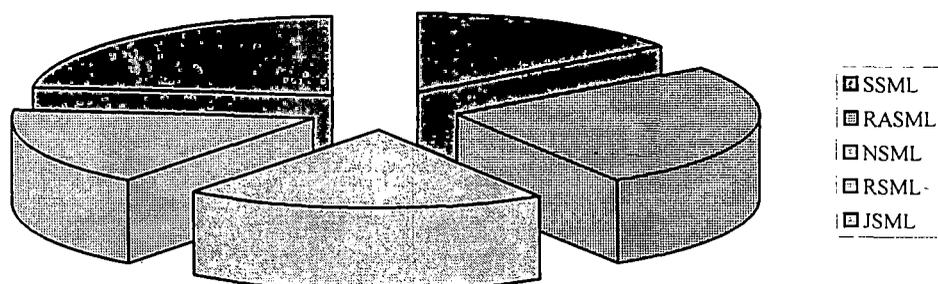
The administration department is divided into different sections such as security, establishment, training complex, school, commercial, store, medical and general administration. Cane department is divided into different sections viz., cane extension, cane purchase, farm section, seed and agronomy and transportation. Factory department is divided into different sections such as workshop, mill house, boiling house, boiler, process, turbine, laboratory, civil and electrical. The finance department is divided into different sections viz., finance and budget, general accounts, salary and wage, management information system and audit, store and insurance, cane accounts and time office.

Table-22 : Distribution of Sample for Hypothesis Three (H₃) from Four Departments of Selected Sugar Mills.

Name of the sampled Sugar Mills	Administration Department	Cane Department	Factory Department	Finance Department	Total
SSML	25	18	42	13	98
RASML	44	39	58	29	170
NSML	30	29	50	16	125
RSML	33	24	35	16	108
JSML	35	36	59	19	149
Total	167	146	244	93	650

Table-22 presents the number of employees of four departments of five sampled sugar mills used in this study.

Exhibit 3 : Distribution of Sample Categories for all 5 Sugar Mills for Hypothesis Three.



For 'QWL' response, data is taken from the five sampled sugar mills and divided into five strata; Executive, Supervisor, Skilled employee, Semi-skilled employee and Unskilled employee across four departments. The following Table-23 presents number of employees taken from five levels across four departments.

Table 23 : Sample Distribution for QWL for Hypothesis Three (H₃), from Five Levels Across the Departments.

Departments	Levels					Total
	Executive	Supervisor	Skilled employee	Semi-skilled employee	Un-skilled employee	
Admini- stration	31	26	44	34	32	167
Cane	27	29	58	15	17	146
Factory	38	30	84	31	61	244
Finance	25	8	45	8	7	93
Total	121	93	231	88	117	650

Table 24 : Sample Distribution from Sampled Sugar Mills Across Five Levels for Hypothesis Three (H₃).

Name of the Sugar mills	Levels					Total
	Executive	Supervisor	Skilled employee	Semi-skilled employee	Unskilled employee	
SSML	16	20	35	10	17	98
RASML	31	21	63	24	31	170
NSML	26	15	45	16	23	125
RSML	19	16	36	20	17	108
JSML	29	21	52	18	29	149
Total	121	93	231	88	117	650

Table-24 shows number of employees taken from five sampled sugar mills across five levels.

In administration department Sr. clerk, godown keeper, come under supervisor. In cane department Sr. clerk, cane development assistant (CDA), centre in-charge (CIC), extension inspector (EI) come under supervisor. In factory department foreman comes under supervisor and in finance department Sr. time-keeper, Sr. clerk come under supervisor.

All clerical staff, typist and steno-typist come under skilled employee. In administration department teacher, dresser, office assistant, security habilder, pharmacist are skilled employee. In cane department office assistant vulcanizer, driver, auto electrician, welders, fitter are skilled employees. In factory department mechanic, painter, Sr. turbine operator, plumber, fitter, welder, turner, mason, estimator, carpenter, fireman, serang, electrician, mill-engine-driver, diesel-engine driver are skilled employee. In finance department cashier, accounts assistant, computist are skilled employee.

Junior clerks from all the four departments are semiskilled employees. In administration department security guard, porter, guesthouse cook come under semiskilled employee. In cane department assistant fitter, assistant welder, watchman, point man, scale man are semiskilled employee. In factory department assistant fitter, assistant welder, junior turner, boiler pump driver, hammer man, boiler attendant, assistant electrician, switch board attendant, maintain assistant, pump attendant, lime sulfur mate, oilman, water attendant are semiskilled employee.

Unskilled employees are known as assistant. Helper, peon, ward boy, sweeper, cleaner, labour, sample boy, gardener are unskilled employee in this study.

Table 25 : Demographic Variables of Subjects for Hypothesis Three (H₃).

Name of the sugar mills	Age (years)		Education (level)		Experi- ence (years)	Income per month (Taka)	Marital status (%)		Sex (%)	
	Range	Mean	Range	Mean	Mean	Mean	Married	Un- married	Male	Female
SSML N=98	22-57	43.07	III- Masters	X	20.96	5177.57	97.96%	2.04%	98.8%	1.02%
RASML N=170	29-57	42.22	I- Masters	X	19.16	5264.77	100%	-	99.42%	0.58%
NSML N=125	28-54	39.84	III- Masters	XI	15.92	4867.24	98.4%	1.6%	99.2%	0.8%
RSML N=108	34-56	42.68	II- Masters	XI	18.47	5460.42	100%	-	95.37%	4.63%
JSML N=149	28-55	42.18	II- Masters	X	19.83	5153.52	96.64%	3.36%	97.99%	2.01%

Table-25 shows a number of 98 employees from Syampur Sugar Mills Ltd., 170 employees from Rajshahi Sugar Mills Ltd., 125 employees from Natore Sugar Mills Ltd., 108 employees from Rangpur Sugar Mills Ltd. and 149 employees from Joypurhat Sugar Mills Ltd. were sampled out for hypothesis three. So 650 employees from different levels sampled out of the five sugar mills served as subjects for the study undertaken for hypothesis three.

All the 98 sampled employees of Syampur Sugar Mills Ltd. were of ages ranging from 22-57 years (mean age was 43.07 years). Their education ranged from class III level to Masters—the mean education being class X level. Their mean experience and income per month were 20.96 years and Taka 5177.57 respectively. Two employees were unmarried and only one employee was female.

All the 170 sampled employees of Rajshahi Sugar Mills Ltd. were of ages ranging from 29–57 years (mean age was 42.22 years). Their education ranged from class I to Masters—the mean education being class X level. Their mean experience and income per month were 19.16 years and Taka 5264.77 respectively. All the employees were married and only one employee was female.

The whole sample of 125 employees of Natore Sugar Mills Ltd. were of ages ranging from 28–54 years (mean age was 39.84 years). The education level of the employees ranged from class III to Masters—the mean education being class XI level. The mean experience and income per month of the employees were 15.92 years and Taka 4867.24 respectively. Two employees were unmarried and only one employee was female.

All the 108 sampled employees of Rangpur Sugar Mills Ltd. were of ages ranging from 34–56 years (mean age was 42.68 years). Their education ranged from class II to Masters—the mean education being class XI level. Their mean experience and income per month were 18.47 years and Taka 5460.42 respectively. All the employees were married and five employees were female.

The whole sample of 149 employees of Joypurhat Sugar Mills Ltd. were of ages ranging from 28–55 years (mean age was 42.18 years). The education of the employees ranged from class II level to Masters—the mean education being class X level. The mean experience and income per month of the employees were 19.83 years and Taka 5153.52 respectively. Five employees were unmarried and three employees were female.

Table-26 shows the sampled executives, supervisors, skilled employees, semi-skilled employees and unskilled employees—mean age (years), mean education level, mean experience (years), mean income per month (Taka), marital status and sex respectively.

Table 26 : Demographic Variables of Subjects for Hypothesis Three (H₃) Across Hierarchical Levels.

Hierarchical Level	Age (years)		Education (level)		Experie nce (years)	Income per month (Taka)	Marital Status (percent)		Sex (percent)	
	Range	Mean	Range	Mean	Mean	Mean	Married	Unmarried	Male	Female
Executive n = 121	35-56	45.44	HSC-Masters	XV	18.12	10,210.64	98.38%	1.65%	100%	-
Supervisor n = 93	30-56	42.18	V-Masters	XII	19.30	5,580.00	97.96%	2.045%	98.93%	1.07%
Skilled Employee n = 231	22-57	41.72	I-Masters	X	19.31	4,225.42	99.57%	0.43%	98.27%	1.73%
Semi-skilled Employee n = 88	29-57	41.30	II-Graduate	VII	19.62	3,560.80	98.86%	1.14%	100%	-
Unskilled Employee n = 117	29-55	39.16	I-HSC	VI	18.20	2,701.54	98.29%	1.71%	96.58%	3.42%

Sample for Hypothesis Four (H₄)

Employees of five sugar mills were considered for Hypothesis four.

Table 27 : Sample Distribution for Hypothesis Four (H₄) from Different Sampled Sugar Mills According to Different Departments.

Name of the Sampled Sugar Mills	Administration Department	Cane Department	Factory Department	Finance Department	Total
SSML	8	6	10	6	30
RASML	17	10	18	7	52
NSML	12	7	14	6	39
RSML	9	6	11	7	33
JSML	15	9	15	7	46
Total	61	38	68	33	200

Table-27 presents the number of employees of four departments of five selected sugar mills taken for this present study undertaken for hypothesis four.

Exhibit 4 : Distribution of Sample Categories for all 5 Sugar Mills for Hypothesis Four.

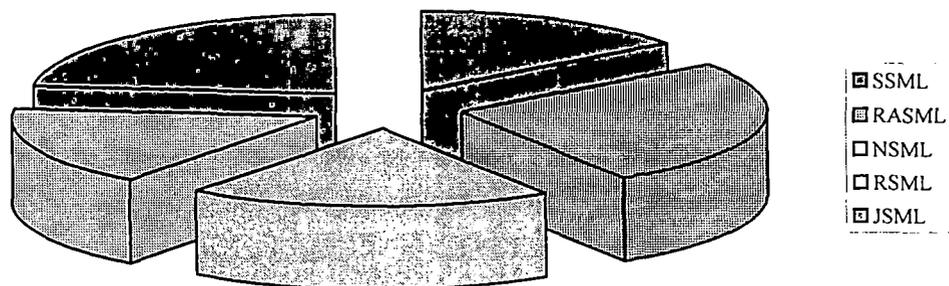


Table 28 : Sample Distribution for Hypothesis Four (H₄) from Departments According to Different Levels.

Department	Levels					Total
	Executive	Supervisor	Skilled Employee	Semi-skilled Employee	Unskilled Employee	
Administration	5	6	20	14	16	61
Cane	6	7	10	8	7	38
Factory	5	7	20	18	18	68
Finance	5	5	10	5	8	33
Total	21	25	60	45	49	200

Table-28 presents number of employees taken from five levels across four departments of the selected sugar mills.

Table-29 : Sample Distribution for Hypothesis Four (H₄) from Sampled Sugar Mills Across Five Levels.

Name of the Sampled Sugar Mills	Levels					Total
	Executive	Supervisor	Skilled Employee	Semi-skilled Employee	Unskilled Employee	
SSML	4	4	10	7	5	30
RASML	5	7	16	12	12	52
NSML	4	4	11	9	11	39
RSML	4	4	10	7	8	33
JSML	4	6	13	10	13	46
Total	21	25	60	45	49	200

Table-29 shows a number of 30 employees from Syampur Sugar Mills Ltd., 52 employees from Rajshahi Sugar Mills Ltd., 39 employees from Natore Sugar Mills Ltd., 33 employees from Rangpur Sugar Mills Ltd., and 46 employees from Joypurhat Sugar Mills Ltd. were sampled out for hypothesis four. So 200 employees from different levels sampled out of five sugar mills served as subject for present study under taken for hypothesis four.

Table 30 : Demographic Variables of Subjects for Hypothesis Four (H₄)

Name of the Sugar Mills	Age (years)		Education (level)		Experie nce (years)	Income per month (Taka)	Marital Status (percent)		Sex (percent)	
	Range	Mean	Range	Mean	Mean	Mean	Married	Unmarried	Male	Female
SSML N = 30	22-55	42.20	III-Masters	X	21.06	4874.37	100%	-	96.67%	3.33%
RASML N = 52	29-55	41.49	II-Masters	IX	18.92	4760.57	100%	-	96.15%	3.85%
NSML N = 39	29-53	39.42	III-Masters	X	15.72	4411.67	97.44%	2.56%	97.44%	2.56%
RSML N = 33	34-56	42.76	II-Masters	X	18.64	4998.94	100%	-	96.97%	3.03%
JSML N = 46	28-55	40.41	0 -Masters	IX	19.39	4466.15	97.83%	2.17%	97.83%	2.17%

Table-30 presents, all the 30 employees of Syampur Sugar Mills Ltd. were of ages ranging from 22–55 years (mean age was 42.20 years). Their education ranged from class III level to Masters—the mean education being class X level. Their mean experience and income per month were 21.06 years and Taka 4874.37 respectively. All the employees were married and only one employee was female.

All the 52 sampled employees of Rajshahi Sugar Mills Ltd. were of ages ranging 29-55 years (the mean age was 41.49 years). The education of the employees ranged from class II to Masters—the mean education being class IX level. The mean experience and income per month of the employees were 18.92 years and Taka 4760.57 respectively. All the employees were married and two employees were female.

The whole sample of 39 employees of Natore Sugar Mills Ltd. were of ages ranging from 29-53 years (the mean age was 39.42 years). The education of the employees ranged from class III to Masters—the mean education level being class X level. The mean experience and income per month of the employees were 15.72 years and Taka 4411.67 respectively. All the employees were married except one and only one employee was female.

All the 33 sampled employees of Rangpur Sugar Mills Ltd. were of ages ranging from 34-56 years (the mean age was 42.76 years). The education of the employees ranged from class II to Masters—the mean being class X level. The mean experience and income per month of the employees were 18.64 years and Taka 4998.94 respectively. All the employees were married and only one employee was female.

The whole sample of 46 employees of Joypurhat Sugar Mills Ltd. were of ages ranging from 28-55 years (the mean age was 40.41 years). The education level was 0 to Masters—the mean education being class IX level. The mean experience and income per month of the employees were 19.39 years and Taka 4466.15 respectively. All the employees were married and only one employee was female.

Table 31 : Demographic Variables of Subjects between Different Departments for Hypothesis Four (H₄)

Departments	Age (years)		Education (level)		Experie nce (years)	Income per month (Taka)	Marital Status (percent)		Sex (percent)	
	Range	Mean	Range	Mean	Mean	Mean	Married	Unmarried	Male	Female
Administration N = 61	22-55	40.97	0-Masters	IX	17.96	5,065.95	98.36%	1.64%	90.16%	9.84%
Cane N = 38	33-54	42.01	III-Masters	X	18.70	5,264.08	100%	-	100%	-
Factory N = 68	28-55	41.12	II-Masters	IX	18.34	3,876.93	98.53%	1.47%	100%	-
Finance N = 33	33-56	41.91	III-Masters	XI	20.15	5,291.06	100%	-	100%	-

Table-31 shows the sampled employees of administration, cane, factory and finance departments and also presents—mean age (years), mean education level, mean experience (years), mean income per month (Taka), marital status and sex respectively.

4.5 Variables Studied

To attain the objectives of the study, following variables have been examined during the investigation.

Independent Variables:

- a. Level of employees : executive, supervisor, skilled employee, semi-skilled employee and unskilled employee.
- b. Demographic variables : designation, experience and age.
- c. Departments of the organization: administration, cane, factory and finance department.

Dependent Variables :

- a. Quality of work life (QWL) of the employees.
- b. Group cohesiveness of four departments (groups).
- c. QWL factors.

4.6 Measuring Instruments

On the basis of literature review and objectives of the present study questionnaires were designed and modified according to comments and suggestions obtained from local and foreign experts, scholars in this field before conducting the field

survey. Three sets of structured questionnaires were prepared to collect primary data from the subjects (Appendices – A, B, and C). The questionnaires were a five point likert type scale. One questionnaire was for employees to analyze the perceptions and expectations about the quality of work life in the selected sugar mills. A second questionnaire was for employees to analyze hierarchical effect of quality of work life. The other questionnaire was for employees to analyze the effect of quality of work life on group cohesiveness.

Existing and Expected QWL

Employee questionnaires and interviews are relevant for the study of most of the aspects of QWL. General Motor Corporation analyzes its QWL by surveying the employees' perceptions regarding various determinants of the QWL.

One structured questionnaire (Appendix-A) was framed to observe the existing and expected QWL of the sugar mills employees. The questionnaire was personally administered among 150 employees working in the five sugar mills. The following ten determinants of QWL were selected on the basis of available literature :

1. *Participation in decision making;*
2. *Career advancement;*
3. *Job safety and security;*
4. *Achievement;*
5. *Compensation;*
6. *Inter personal relations;*
7. *Recognition and praise;*
8. *Job stress;*
9. *Pay and allowance; and*
10. *Working conditions.*

Each component carries two questions. A five point likert scale was used to analyze the perceptions and expectations of the sugar mill employees about the quality of work life in the selected five sugar mills.

This sample of 150 sugar mill employees represent all the four levels (designations) of the employees viz., officer, supervisor, staff and worker across the four departments of different age groups and different experience levels. The respondents were instructed to give their ratings of the various determinants of QWL on a five point scale ranging from 1 to 5, low score representing poor QWL and high score representing better QWL. They were asked to give ratings based on their perceptions of what the QWL actually is and what they expected it to be.

The existing and expected quality of work life was analyzed with the help of Z-test.

Hierarchical Effect in Perceiving QWL

A questionnaire was used to collect data on QWL which was developed by present researcher. The scale includes nine major factors. (Table-32).

1. *Adequate income and fair compensation.*
2. *Safe and healthy working conditions.*
3. *Immediate opportunities to develop human capacities.*
4. *Opportunity for continued growth and security.*
5. *Social integration in the work organization.*
6. *Constitutionalism in the work organization.*
7. *Work and total life space.*
8. *The social relevance of working life.*
9. *Job stress.*

Table 32 : Distribution of Items for Determinants (Factors) and Scoring Pattern for Hypothesis Three (H₃).

Factors	Total Number of Items	Serial No. of Items within the Questionnaire (Appendix-B)
1. Adequate income and fair compensation	7	2, 4, 5, 6, 33, 40, 48
2. Safe and healthy working conditions	3	7, 30, 46
3. Immediate opportunities to develop human capacities	11	1, 17, 18, 19, 20, 21, 29, 31, 34, 45, 50
4. Opportunity for continued growth and security	4	8, 11, 32, 49
5. Social integration in the work organization	9	9, 10, 14, 22, 23, 35, 39, 51, 52.
6. Constitutionalism in the work organization	3	3, 28, 44
7. Work and total life space	4	25, 26, 37, 47.
8. The social relevance of working life	8	12, 13, 15, 16, 27, 38, 41, 42
9. Job stress	3	24, 36, 43
Total	52	52

Scoring : The items on serial number 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 44, 45, 48, 49, 50, 51 and 52 are true keyed. It means the respondent scores always for score '5', often for score '4', occasionally for score '3', rarely for score '2' and never for score '1'.

The items on serial number 1, 20, 24, 25, 26, 42, 43, 46 and 47 are false keyed. It means the respondent scores always for score '1', often for score '2', occasionally for score '3', rarely for score '4' and never for score '5'.

Here in QWL scale out of 52 items—43 items are true keyed and 9 items are false keyed. For the various factors of QWL on a five point scale ranging from '1' to '5' low score represents poor QWL and high score represents better QWL.

Reliability :

To find out the extent of consistency of the scores the splithalf reliability coefficient by odd and even method and test-retest reliability coefficient with the gap of two months on sample of 60 employees were computed. The split-half coefficient was 0.39 and the retest coefficient was 0.76 (both were significant at 0.01 level).

Validity :

For the construct validity the scale was validated against the following standardized tests:

- (a) Job satisfaction scale (Dr. B. C. Muthaya) : The coefficient of correlation between the scores on job satisfaction and quality of work life was 0.49 and 0.39 (significant at 0.01 level) for industrial workers and clerical staff respectively.
- (b) Job Anxiety Scale (Dr. Sinha) : The coefficient of correlation between the scores on job anxiety and QWL was -0.87 and -0.66 (significant at 0.01 level) for industrial workers and clerical staff respectively.

For content validity all the statements of the questionnaire were based on the standard books, related articles and they were discussed with local and foreign experts in the field of organizational behaviour.

The Effect of Quality of Work Life on Group Cohesiveness

There are various reliable sociometric techniques to measure group cohesiveness of the group, yet practically not applicable for groups in industrial settings. An index of group cohesiveness is widely used to measure group cohesion (Seasore, 1954). An index of group cohesiveness is a part of questionnaire which was used in a systematic programme of the Quantitative Research on problems of human relations in large organization conducted by the Human Relations Programmes staff of the Survey Research Centre, Institute of Social Research, University of Michigan. To prepare this questionnaire the guide line of the Survey Research Centre was followed including interviews with employees, staff members and union officials of the sugar mills.

To see the homogeneity of the index of cohesiveness, Seasore (1954) had calculated the degree of inter correlation among the responses to the following questions in Table-33.

Table 33 : Inter-correlation Among Mean Scale Values of the Index of Cohesiveness.

Sr. No.		1	2	3	4
1.	Really part of the group	-	0.15	0.21	0.32
2.	Why men get along	-	-	0.64	0.62
3.	Why men stick together	-	-	-	0.70
4.	Why men help each other	-	-	-	-

Source : Seasore (1954)

The full scale of Seashore (1954) contained certain items which seemed to be inapplicable for this present study. Hence only a part of it (group cohesion index) was used to measure the 'cohesion' variable.

In the present study, the group cohesiveness was measured by 10 items (Appendix-C). The index of the group cohesiveness used in the present study followed the scoring procedure on five point dimensions which are as follows :

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5	4	3	2	1

A high score on the index meant that respondent is part of a very cohesive group and low score will indicate that he/ she is part of a group with little cohesive.

4.7 Pilot Survey

After designing questionnaires and taking experts' and academicians' opinions and suggestions on those a pilot survey was conducted to ascertain the workability and face validity of the questionnaires. The objectives of pilot survey were :

- a) to determine whether the subjects understand instructions and questions in the questionnaires;
- b) to determine whether the subjects could respond properly and correctly; and
- c) to make necessary modification, based on the pilot survey, so that respondents could answer in the right way to each and every item of the questionnaires without much trouble.

To achieve the above objectives, three questionnaires were subjected to a pilot study using a sample of 60 employees from Rangpur Sugar Mills Ltd. and Joypurhat Sugar Mills Ltd. The completed questionnaires were found satisfactory. However, the pilot survey called for the following modifications in the questionnaires :

- i) The term QWL (Quality of Work life) was not very known to the most of the subjects. A statement of clarification of the term is sought by the respondents.
- ii) In some questions few words appeared to be ambiguous and confusing to the lower level employee respondents.
- iii) Some of the subjects suggested to limit the questions but the total number of employees were limited.

To overcome the above problems, necessary changes were made. Words which appeared ambiguous and confusing to the subjects were replaced by more simple and easy words in terms of their meanings. The modified questionnaires were then administered for the final survey.

4.8 Data Collection Procedure

The primary data were collected from the sampled subjects of the five sugar mills (Syampur Sugar Mills Ltd., Rajshahi Sugar Mills Ltd., Natore Sugar Mills Ltd., Rangpur Sugar Mills Ltd. and Joypurhat Sugar Mills Ltd.) during the period from September, 1999 to March, 2000. Each subject was contacted personally and data were collected from the subject after making him convinced about the objectives and importance of the study. The subjects were also assured that their identity and the information given by them would be kept completely confidential.

Three sets of questionnaires (for existing and expected QWL, QWL for five hierarchical levels and the effect of QWL on group behaviour) were personally conducted to each of the subject. The interviews were taken during office time from 7-30 am to 2-30 pm. Out of 1000 subjects, 150 subjects furnished the necessary information for existing and expected QWL, 650 subjects furnished the the necessary information for QWL regarding hierarchical levels and 200 subjects filled up questionnaires for the effect of QWL on group behaviour. Whenever it was necessary, the questionnaires were translated in Bangla and the meaning conveyed to the subjects.

Several problems were faced during the collection of data. Most of the respondents had linguistic problems and they were sometimes reluctant to disclose actual information. Some of them were also afraid as if their response may go against their interest.

Secondary data were collected from the publications of the BSFIC, Bureau of Statistics, Ministry of Industry, Work Performance Report and others.

4.9 Processing of Data

The data about the employees collected through the three sets of questionnaires were processed through microcomputer and necessary analyses were made. The data were grouped into different categories according to age, experience, education, designation (officer, supervisor, staff, worker), hierarchical levels (executive, supervisor, skilled employee, semi-skilled employee, unskilled employee), departments (administration, cane, factory and finance) of sugar industry etc.

Difference between the means were found out and the 'Z' & 't' values were computed to see the extent of difference and the significance level while studying

existing and expected QWL and the differences among levels (hierarchical) with respect to perception of QWL. Comparative bar graphs were also drawn to express the proportions of QWL among hierarchical levels. Correlational and regression analysis were done to examine the effect of quality of work life on group cohesiveness.

4.10 Statistical Tools Used

All data were processed through micro computer using Statistical Package for Social Sciences (SPSS) developed by Nie et. al. (1975).

To analyze the data for the present study following statistical tools were used.

For Hypotheses One and Two : Employees existing and expected QWL and the impact of designation, experience and age on existing and expected QWL.

- a) Mean and SD scores on all factors of existing QWL and expected QWL were analyzed.
- b) The significance of difference of existing and expected QWL was analyzed with the help of the Z-test.

For Hypothesis Three: Hierarchical effect in perceiving QWL.

- a) Mean and SD scores on all factors of QWL and total QWL for all five levels of (i) Administration department, (ii) Cane department, (iii) Factory department and (iv) Finance department and mean and SD across on all factors of QWL and total QWL for all five levels (combined departments) of the organizations.

- b) The significance of difference of departments among levels of each department on all factors of QWL and total QWL and the significance of difference between departments (same level) on all factors of QWL and total QWL was analyzed with the help of 't' test.
- c) Two-way analysis of variance of QWL across four departments and total QWL of the organizations.

For Hypothesis Four: The effect of QWL on Group cohesiveness.

- a) Mean and SD scores of group cohesiveness across four departments (groups).
- b) Correlations and regressions between QWL factors and group cohesiveness across four departments.