THE MANAGEMENT, OPERATION AND THE SOCIO-ECONOMIC STATUS OF WOMEN IN SOME SELECTED SEA FOOD INDUSTRIES

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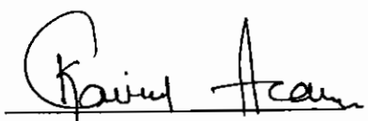

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ABSTRACT

The study was conducted in five seafood industries of Khulna region with a view to assess the status of the industries and the socio-economic condition of female workers. It was observed that most of the seafood industries were established after 1980 while only Bangladesh sea food ind. ltd. was established in 1969. These seafood industries received financial support from Sonali Bank, Agrani Bank and National Bank. The lay out plan of these industries were well designed and each industry had two floors while only Bagerhat sea food ind. ltd. had one floor. On the ground floor, there were all necessary sections such as receiving, processing, storing etc. while laboratory, office rooms, general store room, staff room, prayer room etc. were facilitated in the first floor. All the five seafood industries were private company headed by Board of Directors. They were the owners of the company and decision making authorities for over all development of the company. All the five seafood industries had at least two ice plants which produced block and flake ice and mitigated the ice requirements through the year. Chemical fire extinguisher, gas and sand were used as the fire control equipments for safety of the employers, products and overall industry. Most of the industries had at least two generators bought from different countries (UK, Japan, Germany and South Korea) while Bangladesh sea food ind. ltd. had only one generators bought from UK. The highest number (7) of compressors found in Bangladesh sea food ind. ltd., Southern foods ltd. and MU sea foods ltd. while Bagerhat sea food ind. ltd. had the lowest numbers (5) and Delta fish ltd. had 6 compressors. Compressors were imported from India, Japan, England, Denmark and Russia. Production practices of frozen raw materials were almost similar in the five industries. Shrimps and prawns such as Bagda (*Penaeus monodon*), golda (*Macrobrachium rosenbergii*), Harina (*Metapenaeus monoceros*) and Chaka (*Penaeus indicus*) and white fishes such as *Tenualosa ilisha, Labeo rohita Catla catla* etc. were mainly used as raw materials. Processing by contact plate freezer were usually carried out by all the five industries. Besides, Bangladesh sea food ind. ltd., Bagerhat sea food ind. ltd. and Delta fish ltd. had IQF and MU sea foods ltd. had air blast freezer. These industries used higher concentration (20 ppm) of chlorine water initially for processing and reduced the concentration to 5 ppm Cl_2 until panning or at the IQF stage. All the five industries used Ultra Violet ray to treat water. The types of pack for frozen products were done depending upon buyer's requirements. Most of the industries carried out manual or semi-auto process of carton binding except Bangladesh sea food ind. ltd. where carton

binding was done automatically while in Southern foods ltd. and MU sea foods ltd., carton binding was fully manual. All the five industries had more than two cold storages for storing frozen products. The highest capacity was found in Bangladesh sea food ind. ltd. (650 ton) while lowest in Bagerhat sea food ind. ltd. (220 ton). In the seafood industries investigated women usually worked in all sections. Survey results found that majority of female workers were found to be young and 55% covered the age limit of 15-29. Amongst women workers, 88% were muslims and the rest were hindus while only 2 were christians. 55% of the female workers were divorced and oppressed by their husbands. 57% of them were illiterate while 23% were literate. 68% of the female workers had single family. 36% had families consisting of 3-4 members and 26% had 5-6 members of their families. Most of the female workers (88%) were of rural origin. 66% of female workers were recruited by contractors and 21% were recruited as causal employee. 78% of the female workers had to work for 8-12 hours a day. However, in comparison to hard work by the male workers, their incomes were very poor and ranged between 1400-2400 taka per month. The overtime rate was also low and varied between day and night. The paying system was very irregular and 94% of the female workers did not get payment regularly. 81% of the female workers were unsatisfied with their jobs and for this job mobility among the workers was high. 77% of the female workers changed industry to obtain better salary. 80% of the workers received training. 60% of female workers were the primary earner of their families, 33% contributed to family earning while only 7% played a key role in family decision making. Near about 100% female workers claimed that the management and co-male workers of the industry behaved very roughly with them. However, the overall status of the five seafood industries related to quality of seafood products were very high.

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LIST OF ABBREVIATIONS

BFFEA	Bangladesh Frozen Food Exporters Association
BASFIL	Bangladesh Sea Food Industries Ltd.
BSFIL	Bagerhat Sea Food Industries Ltd.
EU	European Union
DoF	Department of Fisheries
BBS	Bangladesh Bureau of Statistics
UNICEF	United Nations International Children Emergency Fund
MUSFL	MU Sea Foods Ltd.
DFL	Delta Fish Ltd.
SFL	Southern Foods Ltd.
UNDP	United Nations Development Programme
BANSDOC	Bangladesh National Scientific and Technical Documentation Centre
HACCP	Hazard Analysis Critical Control Point
CFC	Chemical Fire Control
PUD	Peeled Undeveined
IQF	Individual Quick Freezing
CPD	Cooker, Peeled and Deveined
PDC	Peeled and Deveined Cooked
GO	Government Organization
NGO	Non Government Organization
Hrs	Hours

CHAPTER ONE:

INTRODUCTION

1.0 INTRODUCTION

1.1 Background of the study

The world's fisheries make a major contribution to human nutrition as well as social and economic progress. Bangladesh is one of the smallest and poorest countries in the world, yet it has got the biggest flood plain in the world next to China and India (BFFEA, 1997). A part from that Bangladesh has about 1,440,000 ha. of coastal land under brackish water, marine aquaculture and a long coast line along the Bay of Bengal extending up to 200 nautical miles. These vast water bodies produced about 1.2 million MT of fish including shrimp which contributes 5.3% to GDP, 5.77% of total foreign exchange and 63% of animal protein supplement and about 12 million people are directly or indirectly dependent for their livelihood on fisheries sector (DoF, 2002). Production has increased almost five fold over the forty years from 20 million MT to 100 million MT by 1999 (DoF, 1999). In the year 2000-2001, fish production was 1.781 million MT, from which Khulna region contributed nearly 75% of the total shrimp production (DoF, 2002).

Due to high demand in the world for shrimp, prawns and other crustaceans, Bangladesh stepped into a new era of sophisticated development in seafood industries. The evaluation of the shrimp processing and freezing plant was initiated in Chittagong. At present, there are 127 seafood industries in Bangladesh with freezing capacity of about 680 tons/day. Amongst them, 55 industries are licensed and EU approved 48 industries (DoF, 2002). There are 58 freezing plants are in greater Khulna region (BFFEA, 1997). The demand for export trade in shrimp and prawn from Asia particularly Bangladesh has been growing steadily. Export of shrimps and other fishery product was non-conventional item before the independence of the country. It has increased many folds during the last decade. Export of seafood is the second biggest sector of the country after garments industry while the raw materials and value addition of this sector is 100% country based (BBS, 1998).

The capacity utilization of all plants has always been unsatisfactory. Most of the plants used to run 40-50% capacity during 1960's. The capacity utilization has decreased gradually due to unplanned growth of the industry and scarcity of raw materials. It has been noted that processing plants in Bangladesh may operate for a maximum of 200 days

a year on the basis shrimp seasons. The percentage utilization of plants capacity have decreased gradually from 24.10% in 1985-86 to 16.68% in 1989-90 and to 19.00% in 1992-93 respectively (Paul, 1994).

The seafood industries have various sections which play a vital role in the ultimate quality of product thus enhancing the foreign exchange earning. These sections are receiving section, processing section, freezing section, packaging section, cold storage section and machinery section. Amongst these sections the most important one is the processing section. This section has realistic affect on the final product due to poor quality maintenance, unfair means of grading and weighing etc.

Seafood industries contribute immensely in the economic development of Bangladesh through earning enormous amount of foreign exchange. The roles of female workers in seafood industry have substantial influences in the quality of the product. Hence, the female workers role should not be undermined. Besides, the policy makers actively seek women because they represent a very vast population of the country. The management people prefer women as they are mostly suitable for processing activities, less mobile and less likely to engage in the union activities.

Although women in other parts of the world are in better status in the society, females of Bangladesh are found the most suffering section. In Bangladesh women are thought of as inferior to men everywhere. They have also less control over their own lives and properties. Besides this, women's needs are counted as secondary in comparison to the needs of male in a family as well as in the society. But female participation in income earning activities is an indicator of the socio-economic condition of the country. After the liberation War of 1971, the women folk of the country gradually took part in the income earning activities and at present women are involved almost every field of the job market. Even then, female workers are often deprived of their basic dues in terms of salary, working environment, facilities etc.

Women play an important role in small scale fisheries, directly or indirectly, all over the world. In most fishing communities, men are engaged mainly in fish capture while women take part in a wide range of pre-harvest and post-harvest activities such as net

making, fish handling, processing and marketing. In the seafood business, about one million workers are engaged, of which nearly 80% are women (Coulter and Disney, 1987). Most of the workers are illiterate and many of them do not know about their responsibility. However, the activities of female workers influence the socio-economic status of the industry. In spite of the important contributions made by the female workers, the seafood industries in Bangladesh is beset with numerous complains such as wide scale labour lawlessness including employment of child labour, exploitation by low wage and over work, large scale social in-security etc.

Bangladesh has a bright prospect of earning substantial amount of foreign currency through exporting of frozen fish products. Therefore, it is indispensable to improve the working environment in the seafood industries especially for the female workers.

1.2 Objectives of the study

The broad objectives of the present study were to assess the status of five seafood industries i.e. management and operation methods and to assess the socio-economic status of the female workers.

The specific objectives of the study were:

- To study the status of the management and operation methods of seafood industries i.e. location, year of establishment, financial support, layout plan, organogram, important accessories, production flow chart, brand name and cold storage capacity.

- To assess the socio-economic condition of female workers in seafood industries i.e. age, religion, marital status, educational status, family types, earnings, job satisfaction and social status.

1.3 Justification of the study

Frozen foods particularly fish and shrimp products have been playing a vital role in the national economy of Bangladesh for last one decade and its contribution export earning is increasing. Shrimps and prawns contribute 62 - 63% by volume and 80- 85% by value of the total exported fisheries products (DoF, 1999). In recent years, frozen shrimp and other types of the fishery products were detained or rejected by health authorities of various importing countries with problems such as; decomposition, high total viable bacterial count, filth, unexpected foreign matter and food- borne microbial pathogens.

Bangladesh did not fetch the expected amount of foreign exchange earning that it should have, due to lack of technology, poor management and underprivileged operation by the authority and its distribution from the fisherman to higher sector on different spheres, the total caught are not consumed properly. This study will identify various problems in seafood industries with regard to quality of shrimp or prawn that are exported.

In the frozen fish Business about one million workers are engaged, among them near about 80% are women. Most of the workers are totally illiterate although they work in the vital area of the industry. However, the female workers activities influence the socio-economic status of the industry. In fish processing industry, female workers suffer from various problems. In developed country, the female workers can perform their work without any problem but in Bangladesh, the different group of employees harasses female workers (Islam and Mahamuda, 1975).

Female employment is a much-talked issue of present time, which seeks effective attention. Many studies have been conducted on this issue in the country. Most of the studies have considered the garments female workers in different cities of Bangladesh such as Dhaka, Chittagong etc. But no detailed study has been yet conducted on the female workers of the fish processing industries. The female workers activities in seafood industries and their evaluation are unsatisfactory. Females are employed in all section in seafood industries, but there is no legislation that regulates effectively working condition and wage level. Therefore the systematic study has to be done on female workers in seafood industries.

CHAPTER TWO:

REVIEW OF LITERATURE

2.0 REVIEW OF LITERATURE

Scanty studies have been observed related directly to the management, operation and socio-economic status of female workers in seafood industries in Bangladesh or elsewhere. However, in this chapter, relevant work (direct/indirect) have been reviewed.

Connell (1994) stated that fish is perishable commodity and may spoil within 24 hours though it is kept on ice. Species in temperate climate may have shelf life of 20 – 30 days. It is roughly estimated that more than 30,000 MT in fish are lost annually in developing country like Bangladesh due to inadequate handling, processing and distribution. Some five thousands tons are lost every year due to insect infestation. When this is prevented, it could add some 10% to human consumption after being processed properly for ready-made value added products. There is considerable wastage (30%) due to current traditional methods of handling and processing in Bangladesh (Azam and Rahman, 2003). For nutritional reasons, fish must be distributed among a wider inland population and this requires fish to be well processed

Love (1979) described that the need of fish processing arises for many reasons. The shoaling pelagic species are caught in very large quantities. However due to their high fat content and rapid rate of deterioration and the scale of catching, can not be absorbed fully by the consumer market at a level of commercial viability. Such fish are suitable for reduction to fishmeal and oil. Fishes suitable for the consumer market may be landed in gut conditions at the peak of the fishing season and processing provides outlets for the surplus. Certain fishes in marine origin are usually produced in larger quantities than the consumer market can absorb as fresh fish, but provide a different consumer product in a processed form, such as canned fish, which provides a convenience food with a long shelf life and last years together.

Govindan (1995) conducted a study which described that freezing basically consists of removing heat from a substance until it attains sub-zero temperature and assumes a hard consistency by the solidification of its water content.

Quality problems are caused by the particular nature and variability of raw materials e.g. the environment, feed and season. Quality control can be defined as "all methods, procedures, techniques and process employed to inhibit, delay or prevent deteriorate changes in freshly caught fish and in fish products and to prevent contamination or adulteration". More simply qualify control is the application of technology to the handling, production, manufacture, storage and distribution of fish and fish products in order to meet established or acceptable forms (Dempsey, 1971).

Southern part of Bangladesh plays an important role in earning foreign exchange through export of shrimp. Exporting of goods to inject dynamism in to the country concerned. Economists now recognize that there is a strong positive relationship between the growth of exports and economic growth. Exporting forces the exporter to pay special attention to quality and to keep costs down (Palfreman, 1985).

Afsar (1992) reported that women go to the cities because of their children and other family members such as younger brothers, sisters and elderly parents, who are depended on them. In order to survive and to achieve social security and protection, they often get married and most of them engage themselves in some kind of jobs. Women are found to work for longer period (51 hrs/week compared to 49 hrs/week for men) but get very low wages, nearly one–forth of males wage (15 TK./ day compared to the 54 TK./ day for male workers). They are found mostly engaged as domestic servants, unskilled workers/helpers in manufacturing factories, construction and a few could enter in the formal sectors. Some of them even end up in prostitution and begging.

Salahuddin and Shamim (1992) studied on 200 working women of Mohammadpur, Kallor, Nilkhet-Palashi and Khilgaon Bastee of Dhaka city. Among these 200 working women, 78 % were wage-employed, 14% self-employed and rest 8% women were unpaid family labourer. Majority were in 21-40 age group. Sweeping, water carrying, grinding of pieces, canteen work, factory work, sewing, domestic work etc. were types of wage employment. Among various type of self-employment jobs, they identified vegetables growing, fish vending, ash vending, vegetables selling, shop keeping, selling of rice cake etc. Both in self and wage-employment income level is very low and is mainly within the

range of TK. 1499 per month. Most poor households rely heavily on women's income especially where the woman is widow, divorced or abandoned or the husband is sick, disable or unemployed.

There are large numbers of families of Bangladesh that are female–headed household and these families are entirely governed by housewives. Wives perform the principal task of the family. In these families, the wives are the main earning members (Begum and Greely, 1993).

Kabir *et.al.* (1993) observed the impact of development projects on women's socio-economic and demographic behavior. They found that the poor women participated in various development projects of different organizations in order to raise family income as well as to alleviate poverty. 26.31% women wanted to avail the opportunity of education only to get the opportunity for employment. Types of income generating activities of respondents were lives stock rearing, poultry rearing, handicrafts, sewing cloth, paddy husking, petty business, selling vegetables etc.

Jahan (1975) stated that the largest numbers of women were employed in factories. Nearly half of the female non-agricultural labour forces belong to manufacturing and mechanical occupations. Urban women were employed in low paid jobs such as factory labourer, street cleaner and construction workers as well as in professional and technical occupations.

Islam (1975) found that 80% working women were in 21 – 40 years age group and 60% and 37.5% women were married in an interview taken from 200 working women in Dhaka city.

UNICEF (1993) provided a report on a short picture of life and struggle of poor urban women. According to this report, women comprised half of the urban poor population. Their lives were marked by grinding poverty, negative attitude, wage discrimination, exploitation and social vulnerability. In urban areas, women were concentrated on uncertain labour, intensive activities such as the garment, pharmaceutical, tea, jute, bread,

food and fish processing industries. The textile and garment industries were largest employers of women, accounting for 46% of the female industrial work force. In the informal sector, poor urban women have been involved in low paid unskilled job, for instance working as domestic, or making paper bags, coir fiber or jute string.

Khan (1992) indicated that poverty, landlessness, and mail out-migration have increased women's responsibilities as sole, primary or secondary income earners of the households. Women's participation to remunerative employment and export-oriented production is expanding. But their enhanced economic role has not gone hand in hand with substantial improvement in education, training, health and nutrition and access to productive resources and services.

UNDP (1994) reported gender disparity. Women position and contribution in economy and politics has also been presented. Limited opportunities of wage employment resulted in women being underemployed and receiving low wages. Statistics revealed that women's average weekly earning were about 42% of men's, especially in slack seasons. Wage rates for women were about half of men's. About 43% of women and only 8% of men earned less than TK. 100 per week.

The movement of women to cities presupposes an economic role for them, but exact nature of this role varies according to social, economic and political as well as to the personal qualities of the migrants themselves (David, 1987).

The poor workingwomen have to undergo various types of harassments and social obstacles. Employed in similar works women have less wages than men. Lack of education, proper training and professional expertise forces them to choose a work with less pay (Ahmed, 1992).

Miah (2000) stated that BFRI evolved aquaculture technologies have created an ample scope for men and women to get self-employed job and better opportunities for income earning activities. Women were identified as two categories such as adopter and worker in fish farming activities. This study revealed that around 32.0 per cent adopters were

women while, on an average, 20.0 per cent woman worked in the selected aquaculture technologies as labourers.

Kohinoor *et al.* (1996) reported that men generally do field level activities while women are involved in post-harvest work along with usual day-to-day household activities in agriculture of Bangladesh. This situation, of course, is gradually changing and good number women are being attracted by non-traditional activities, which are out side the homestead and include different kinds of field level agricultural activities as well.

Alagarswami (1992) described in the study that in the coastal aquaculture sector, women are generally engaged in activities like shrimp seed collection, management of small ponds, collection of snails for feeding shrimp, feed preparation, mussel attachment to ropes, nucleus implementation in pearl culture, net making and fabrication of cages and in the commercial aquaculture sectors, women were found largely at the technical level in India.

Keamany (1996) observed in China that women were found to be very active in carrying out day to day activities like fertilization, feeding and other pond management aspects, spending time anywhere between 1-3 hours in the aquaculture activity. Men usually undertook heavy work like pond digging and women assisted in the activity. Like in other countries, here also, it was the men who attended most of the training, while women carried out significant portion of the activities. Whenever, women attended the training, they participated very actively in the training.

Baluyut (1987) described the role of women in Asian aquaculture and noticed tremendous contribution of women to all sectors of aquaculture related activities in China from pond digging to processing of fish. Rapid growth of aquaculture in China has been attributed partly for the contribution of women to various activities.

CHAPTER THREE:

MATERIALS AND METHODS

3.0 MATERIALS AND METHODS

3.1 Selection of industries

The major concentrations of the seafood industries are in Khulna and Chittagong. About 75% of seafood products are exported from Khulna region due to availability of raw materials. For the present investigation, five industries have been selected for detail survey about the status of seafood industries and about the status of women in seafood industry. The industries are situated in four districts i.e. Bagerhat Sea Food Industries Ltd. (BSFIL) of Bagerhat, MU Sea Foods Ltd. (MUSFL) of Jessore, Delta Fish Ltd. (DFL) of Satkhira and Bangladesh Sea Food Industries Ltd. (BASFIL) & Southern Foods Ltd. (SFL) of Khulna. In Khulna district the industries are situated on both the side of Rupsha river. Therefore, two industries (one from each side of the river bank) were selected.

3.2 Selection of workers

In a seafood industry, the female workers usually work in the following sections:

- Sorting,
- Grading,
- Beheading,
- Peeling,
- Washing,
- Panning,
- Glazing,
- De-panning,
- Packing,
- Quality control

In general, two shifts are running in every seafood industry and each consists of 100-130 manpower (both male and female). About 90% women workers are engaged in processing activities. From the five industries, sixty workers were selected. In quality control section two or three workers and in peeling section the highest amounts of workers were engaged in each industry. Two workers from quality control and 10 from peeling section and six workers from the rest of the section were randomly selected for survey.

3.3 Data collection

Different data and information both documentary and oral is necessary to produce meaningful result. Both primary and secondary sources were used at all level of industries. However, a reconnaissance survey was conducted initially in seafood industries. During the study, informal discussions were held with the female workers, contractors and the seafood owners. Through the reconnaissance survey and informal discussion, a model questionnaire was designed. The questionnaire was revised into final form through review and pre-testing. The questionnaire was rearranged for the purpose of inclusion of relevant information, preparation of open and close format of questionnaire; consistency in the design of the questionnaire and pre-testing before finalizing the questionnaire.

3.3.1 Primary data

The primary data were collected through three sets of structural questionnaires. One questionnaire was used for the entrepreneur, one for contractor and one for the women worked in the selected seafood industries (Appendix - 1, 2 & 3).

3.3.2 Secondary data

For conducting the study, secondary data were collected from different sources.
The sources are given as follows:

Bangladesh Frozen Fish Exporters Association, Khulna
BANSDOC
Journals, Books
Personal Communication

3.4 Indicator used

For obtaining detailed information about the socio-economic status of the female workers the following indicators were used:

- Age distribution
- Family size
- Religion status
- Origin
- Education level

- Marital status
- Occupational status
- Child labour
- Mode of recruitment
- Work Hour
- Prayer Facilities
- Overtime work
- Earnings
- Attendance and leave
- On Job training
- Job mobility
- Security
- Job satisfaction
- Living condition
- Health facilities
- Social status
- Legal rights

While to know about the management and operation of the industries the following indicators were used:

- Location, year of establishment, first year of production and financial support.
- Organogram of these industries.
- Manpower and their salaries.
- Ice manufacturing plants.
- Fire control equipment.
- Machinery room, chill room.
- Production flow chart, water supply plant, chlorination.
- Freezing procedures, landing, receiving, purchasing, washing, grading, cleaning and processing section.
- Packing, weighing and thawing.
- Brand name, cold storage.

3.5 Data analysis

All the collected information obtained from the industries were accumulated, grouped and interpreted according to the objectives as well as the indicators. Some data contained numeric and some contained narratives facts. The data were then presented in graphs and tabular form. For processing and analysis purpose, MS Excel and MS Word have been used. Descriptive statistics such as means, standard deviation, frequency distribution, cross tabulation, correlation, pie-charts, etc. have been used for data analysis and presentation.

4.0 RESULTS AND DISCUSSION

4.1 Status of seafood industries

4.1.1 Management and operation of sea food industries

4.1.1.1 Location, year of establishment, first year of production and financial support

Bangladesh Sea Food Ind. Ltd. (BASFIL) and Southern Foods Ltd. (SFL) are situated on both the side of Rupsha river, about 4 km distance from Khulna city. Most of the sea food industries of Khulna are established in Char Rupsha, adjacent to Rupsha river. However, Bagerhat Sea Food Ind. Ltd. (BSFIL) is situated in Town Noapara, Fakirhat (Bagerhat), approximately 8 km away from Rupsha river. MU Sea Food Ltd. (MUSFL) is situated in Jhumjhumpur, Jessore while Delta Fish Ltd. (DFL) is situated in Debhata, Satkhira.

BASFIL is one of the oldest seafood industries and was established in the year 1969 before liberation. SFL was established in 1992 and production started in the same year. BSFIL was established in 1992 and production started lately after about two years (1994). The delay for production was due to delayed transaction between the bank and the industry. MUSFL was established in 1984 and the production began in the same year. DFL was established in 1989 and the production began in the same year.

Most of the industries were established between 1988 and 1995 in Khulna region (Table-1). Seafood industries require a large amount of capital for its establishment and production. Enhanced financial support is essential to run seafood industries smoothly. Bangladesh Govt. started giving loan for establishing seafood industries immediately after liberation. The loans earlier were given for both fixed and working capital. Bangladesh Govt. however, recently changed it's policy to provide loans. At present, banks are providing loans on the basis of only working capital and volume of product. The fixed capital was usually provided by the Board of Directors of these industries and include cost of land, factory building, different types of freezers, machinery equipment etc. The five industries e.g. Bangladesh Sea Food Industries Ltd., Southern Foods Ltd., Bagerhat Sea Foods Industries Ltd., MU Sea Foods Ltd. and Delta Fish Ltd. received their loans from Sonali Bank, National Bank and Agrani Bank. Financial support for seafood industries in Khulna region are mainly provided by Sonali Bank and Agrani Bank (Table 2).

Table-1: Year of establishment and first year of production

Sl. No.	Name of Seafood Industries	Year of Establishment	First Year of Production
1.	Bangladesh Sea Food Ind. Ltd.	1969	1969
2.	Southern Foods Ltd.	1992	1992
3.	Bagerhat Sea Food Ind. Ltd.	1992	1994
4.	MU Sea Foods Ltd.	1984	1984
5.	Delta Fish Ltd.	1989	1989

Table-2: Financial support of Bank

Sl. No.	Name of Seafood Industries	Banks
1.	Bangladesh Sea Food Ind. Ltd.	Sonali Bank
2.	Southern Foods Ltd.	Sonali Bank
3.	Bagerhat Sea Food Ind. Ltd.	Agrani Bank
4.	MU Sea Foods Ltd.	Agrani Bank
5.	Delta Fish Ltd.	National Bank

4.1.1.2 Layout plan of sea food industries

The layout plan of BASFIL is very well designed. The industry has two floors. On the ground floor, all necessary sections are observed. In this floor, there are three block freezers. There is also IQF section in this floor and four cold storages. On the first floor, there are mainly office rooms, prayer room, storage rooms and a guest house. Additionally, there is also cooling plant including other facilities in the first floor.

SFL has two floors. On the ground floor, all necessary sections are observed such as receiving, processing, storing etc. In this floor, there are three contact plate freezers. There are three cold storage rooms, two ice plants and a chill room is facilitated in this floor. On the first floor, there are mainly laboratory, prayer room, storage rooms etc.

BSFIL has been set up in one storied building which is used for all the purposes of processing. There are three cold storage, one receiving room, one chill room, machine

room, Air blast freezer, IQF section, ice plants etc. There is a two storied building in front of the production building which is mainly used for official work.

The layout plant of MUSFL has been set up in two storied building. The ground floor is mainly used for the purpose of processing. In this floor, there are five clod storage rooms, one production room, three contact plate freezers, two air blast freezers, two chill rooms, two ice plants, machine room and other rooms such as fish landing, receiving, toilets etc. On the first floor, there is a female rest room, quality control laboratory, office room, general store room, packaging room, staff room, prayer room, etc.

The layout plant of DFL has been set up in two storied building. The ground floor is mainly used for the purpose of processing. In this floor, there are two clod storage rooms, one production room, two contact plate freezers, one chill room, one ice plant, machine room and other rooms such as fish landing, receiving, toilets etc. On the first floor, there is a peeling section, female rest room, quality control laboratory, office room, condenser, general store room, packaging room, staff room and prayer room.

Most of seafood industries have adopted HACCP (Hazard Analysis Critical Control Point) as per the requirement of European Commission and other importing countries in order to compete in the international market.

4.1.1.3 Organogram of sea food industries

Most of the Sea Foods industries are private company headed by Board of Directors, which include Chairman, Managing Director and Directors. They are the owner of the company and decision making authorities for over all development of the company. There are also other personnel included in the company as shown in Fig-1, Fig-2, Fig-3, Fig-4 and Fig-5. The duties and responsibilities of various personnel in the seafood industries are given below:

Chairman: Chairman is the Chief Executive of a company who reviews all the functions including production. Quality assurance, sales, makes necessary arrangements to HACCP plan and implement all aspects of decision made by the Board of Directors.

Managing Director: Managing Director reviews the over all HACCP, plan that include the production, quality assurance, sales management etc.

Factory Manager: Responsible for daily operation with respect to production and introduction of any new processing methods according to the top management decisions. Review the HACCP plan with all other manager. Responsible for all type of product processed in the industry.

Production Manager: Overseas the daily production facilities and reports to the factory manager. Works closely with the factory manager in directing raw materials in to product. Decides the production schedule for the day and responsible for overseeing all personnel.

Purchase in charge: Responsible for purchasing of all types of raw materials, packing and labeling materials and also other stationeries needed for the industry. Also responsible for reviewing the HACCP plan.

Quality Control Officer: Responsible for checking the quality at different control points. Responsible for managing/handling the complains of oversees customer. Also help the HACCP plan with others. Responsible for ultimate quality of the product related to organoleptic, biochemical and microbiological parameters.

Quality Control Inspectors: Responsible for checking the quality at different control points. Also responsible for HACCP plan implementation and looks in cleaning and sanitizing status of the plant. They are responsible for checking the overall product quality inspection.

Commercial Manager: Deals mainly with export related work, help in the shipment of frozen product properly and responsible for handling the overseas customers.

Machine Room Foreman: Responsible for overall working of machinery's electricity supply and ensures smooth running of the industry.

Supervisor: Responsible for supervising the whole work. Also responsible for HACCP plan implementation.

Grader: Responsible for grading and usually follow the rule of HACCP plan.

Workers: Carries out daily work given by factory managers and usually are instructed to follow the HACCP plan of the factory.

Security Guard: Responsible for overall security of the factory.

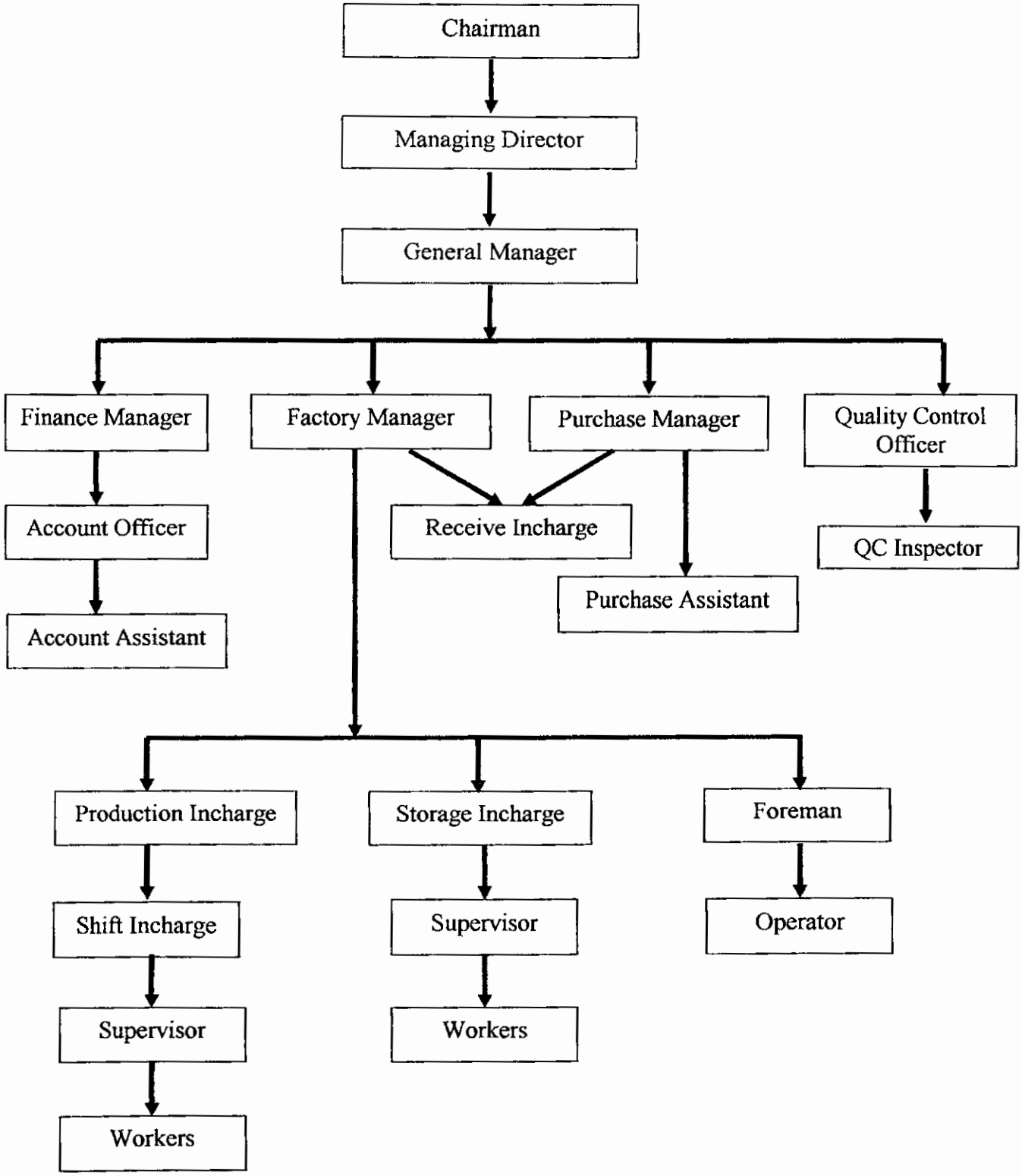


Fig-1: Organogram of Bangladesh Sea Food Ind. Ltd.

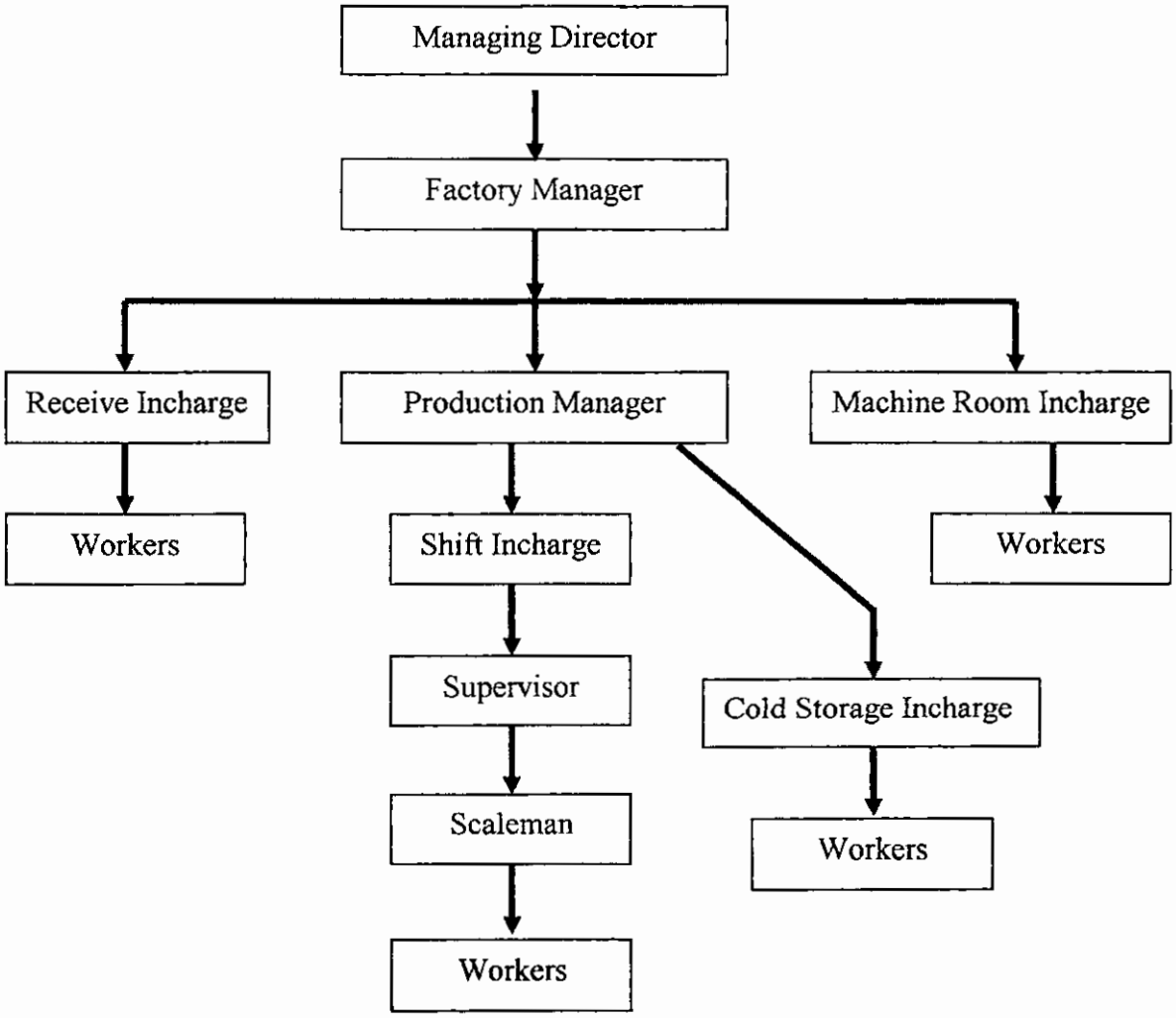


Fig-2: Organogram of Southern Foods Ltd.

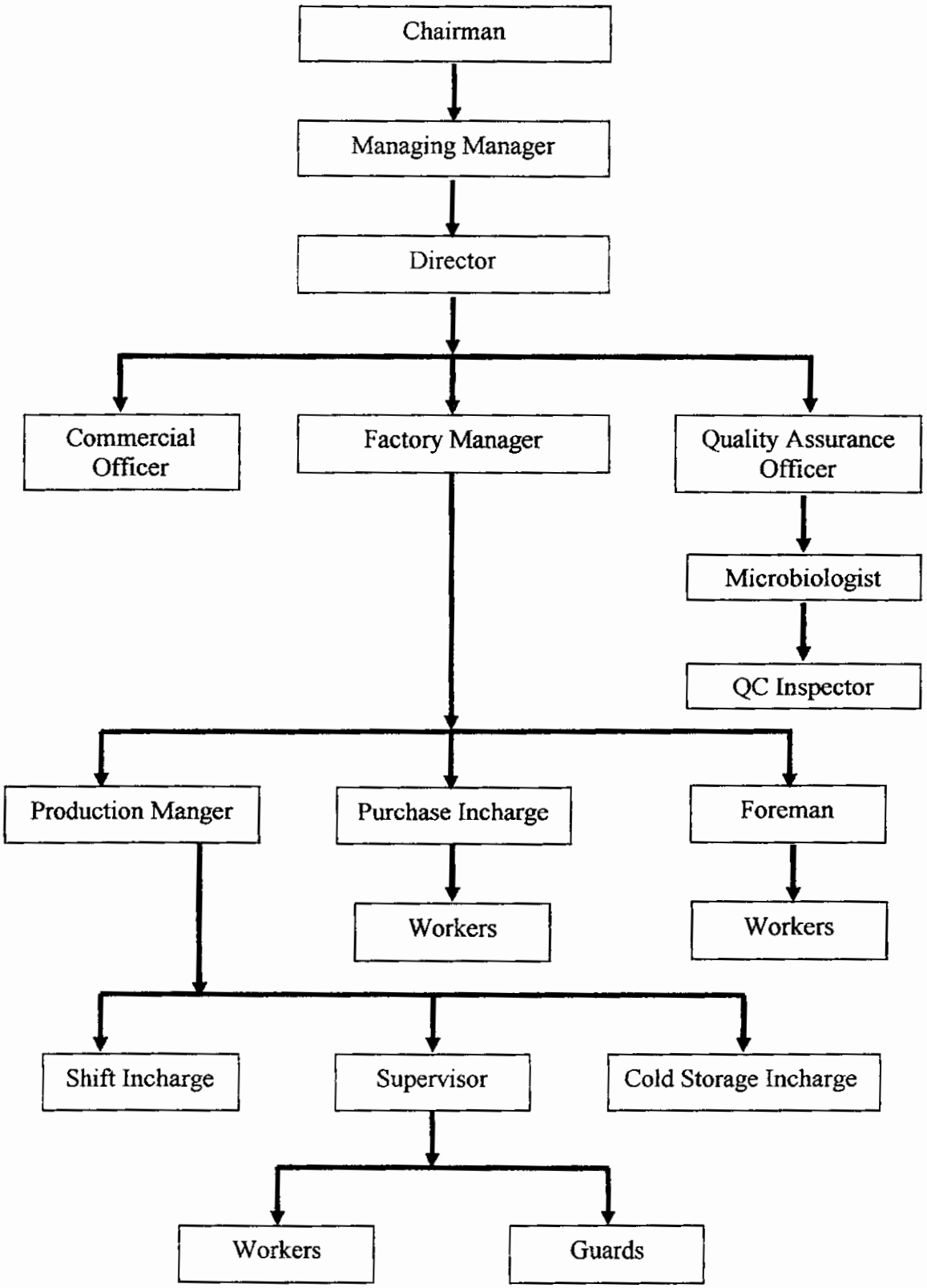


Fig-3: Organogram of Bagerhat Sea Food Ind. Ltd.

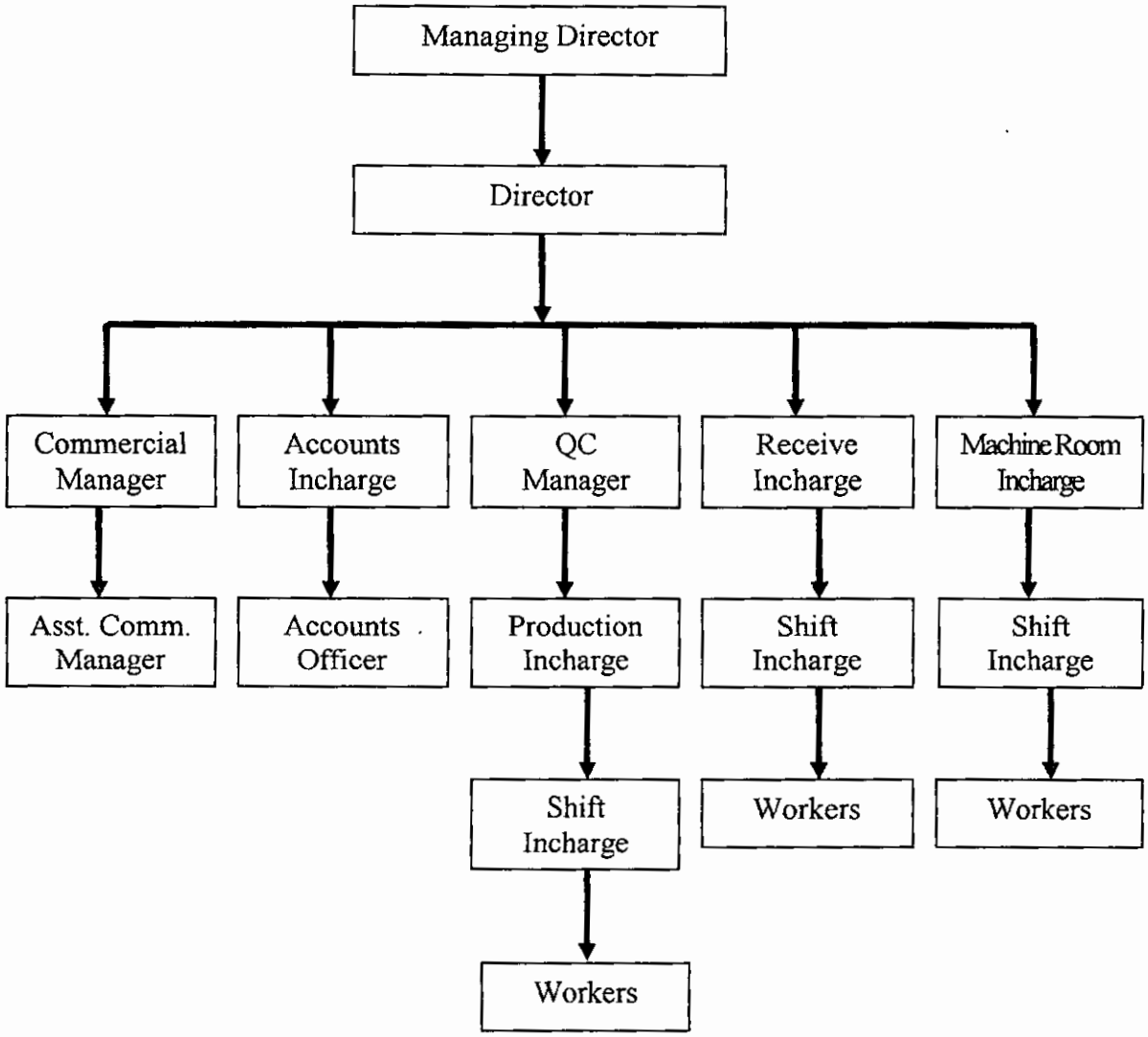


Fig-4: Organogram of MU Sea Foods Ltd.

4.1.2 Important accessories

4.1.2.1 Ice manufacturing plants

One of the vital accessories of seafood industries is ice manufacturing plant, without which the raw materials are likely to spoil quickly. Ice is essential and used to keep the temperature of the raw materials as low as possible until the product is seafood (Lisac, 1974). There are two types of ice plants producing block ice and flake ice.

BASFIL has two ice plants which produces block ice and flake ice. Total capacity of block ice plant is 25 tons per day and 15 tons per day for flake ice plant. The total ice production can mitigate the total ice requirements during peak season. The industry has two ice crushers. There is also an ice bar store room whose capacity is approximately 100 tons/day.

There are two ice plants in SFL. One is block ice plant which produces ice bars. The total capacity of block ice production is 20 tons/day. The other is a flake ice plant which produces 18 ton/ day flake ice. During the peak season 15 ton / day ice is required which therefore mitigates the requirements of ice.

BSFIL has two block ice plant whose total capacity is 40 tons/day and a flake ice plant whose total production is 5 ton/day. Among the two block ice plant, one of them produces 25 tons and other produces 15 tons/day. There are tow ice crusher in this factory.

MUSFL has one block ice plant of capacity 15 ton/day and one flake ice plant of capacity 15 ton/day. At the peak season 25 ton/day is required which is fully supplied by these two plants.

DFL has two ice manufacturing plants with a capacity of 18 tons and 10 tons per day and produce block ice and flake ice respectively. The industry has one ice crusher. The total production of ice from these two ice plants can mitigate the ice requirement during the peak season.

It is found that ice productions in all industries are sufficient during peak season. The quality of frozen products thrives on the consistent use of ice on the product till it is frozen

(Kreuze, 1971). Therefore, the seafood industries should ensure sufficient quantity of ice supply consistently throughout the year.

Table-3: Types of ice plants, capacity of production and ice requirement per day during peak season

Sl. No.	Name of Seafood Industries	Type of ice plants	No of ice plant	Capacity of ice production (tons/day)	Ice requirements during peak season (tons/day)
1.	Bangladesh Sea Food Ind. Ltd.	Block	1	25	30
		Flake	1	15	
2.	Southern Foods Ltd.	Block	1	20	15
		Flake	1	18	
3.	Bagerhat Sea Food Ind. Ltd.	Block	2	40	45
		Flake	1	10	
4.	MU Sea Foods Ltd.	Block	1	15	25
		Flake	1	15	
5.	Delta Fish Ltd.	Block	1	18	25
		Flake	1	10	

4.1.2.2 Fire control equipment

For safety of the employers, products and overall industry, fire control equipment are essential. Sand and water are the usual items which are used in most of the seafood industries. Chemical Fire Control (CFC) extinguisher is the fire control equipment of BASFIL while sand and gas are used as fire control equipment in SFL and BSFIL. In MUSFL, sand and extinguisher are the fire control equipment. Chemical Fire Control (CFC) extinguishers, sand are the usual fire control equipment of DFL.

Table 4: Fire control equipment used

Sl. No.	Name of Sea Foods Industries	Fire Control Equipment
1.	Bangladesh Sea Food Ind. Ltd.	Chemical fire control extinguisher
2.	Southern Foods Ltd.	Gas, Sand
3.	Bagerhat Sea Food Ind. Ltd.	Gas, Sand
4.	MU Sea Foods Ltd.	Sand, extinguisher
5.	Delta Fish Ltd.	Chemical fire control extinguisher, Sand

4.1.2.3 Machinery room

The machinery room of seafood industries mainly includes generators and compressors. Generators are used during the electricity failure. The compressor is used for compressing the ammonia gas for both ice making, and cooling the contact plate freezer, air blast freezer, individual quick freezer (IQF) and cold storage room.

BASFIL has 1 generator and 7 compressors in its machine room. The SFL has 2 generators and 7 compressors and BSFIL has also 2 generators and 5 compressors in its machinery room. There are 2 generators and 7 compressors are used in MUSFL and 2 generators and 6 compressors are used in DFL. Among the five sea food industries, each of four has 2 generators and only BASFIL has 1 generator. The highest number of compressors found in BASFIL, SFL and MUSFL while lowest was found in BSFIL.

Various types of Generators and compressor are used in seafood industries in Khulna region. BSFIL purchased one generator from Germany with a capacity of 600 KVA while SFL purchased one generator from South Korea with a capacity of 125 KVA. Most of the generators of other seafood industries have been purchased from UK and Japan. All the industries have at least one compressor from India except MUSFL. MUSFL purchased all compressors from Japan and BASFIL purchased 2 compressors from Russia (Table 5).

Table-5: The number of generators and compressors are used in seafood industries

Sl. No.	Name of Sea Foods Industries	No of Generators	Capacity of Generators	Origin of Country	No. Compressors	Origin of Country
1.	Bangladesh Sea Food Ind. Ltd.	1	500 KVA	UK	7	Indian 2 Russia 2 Denmark 3
2.	Southern Foods Ltd.	2	28 KVA 125 KVA	UK South Korea	7	Japan 2 Indian 3 Denmark 2
3.	Bagerhat Sea Food Ind. Ltd.	2	120 KVA 600 KVA	UK Germany	5	India 4 England 1
4.	MU Sea Foods Ltd.	2	135 KVA 10 KVA	Japan	7	Japan
5.	Delta Fish Ltd.	2	500 KVA 275 KVA	Japan	6	Indian 2 Japan 4

4.1.2.4 Chill room

In chill rooms excess raw materials are stored temporarily for several hours/days. Seafood industry must have at least one chill room but in case of large industry, more than one chill room is needed specially during glut period (Descrosier, 1973). Each seafood industry has only one chill room that store raw materials usually for 1 -2 days. But in peak season the raw materials are stored for 8-10 days in the chill room.

4.1.2.5 Water supply plant

Water supply plays a vital role in keeping quality and sanitation of a seafood industry. There are tanks that supply water to various point of seafood industry. In general tank supply water to the fish processing company that are being filled up by pumps attached to deep tube wells (Paul, 1994). In seafood industries Ultra Violet ray was used to treat water and sometimes they use iron remover to treat water.

4.1.2.6 Chlorination

Chlorine is a chemical compound that has a germicidal effect. Most of the seafood industries preliminary wash their raw materials using chlorinated water (Mewer, 1986). Chlorinated water are also used during processing of sea food products before freezing (Blackwood, 1978). For preliminary washing purposes, most of the sea foods industries used 20 ppm while Bagerhat Sea Food Ind. Ltd. 15 ppm, chlorinated water which act as germicide. At the initial stage of processing, concentration of chlorine for washing and cleaning purposes in relatively high. These industries used higher concentration of chorine water initially and reduce the concentration to 5 ppm Cl_2 until panning or IQF stage.

4.1.3 Production of frozen raw materials

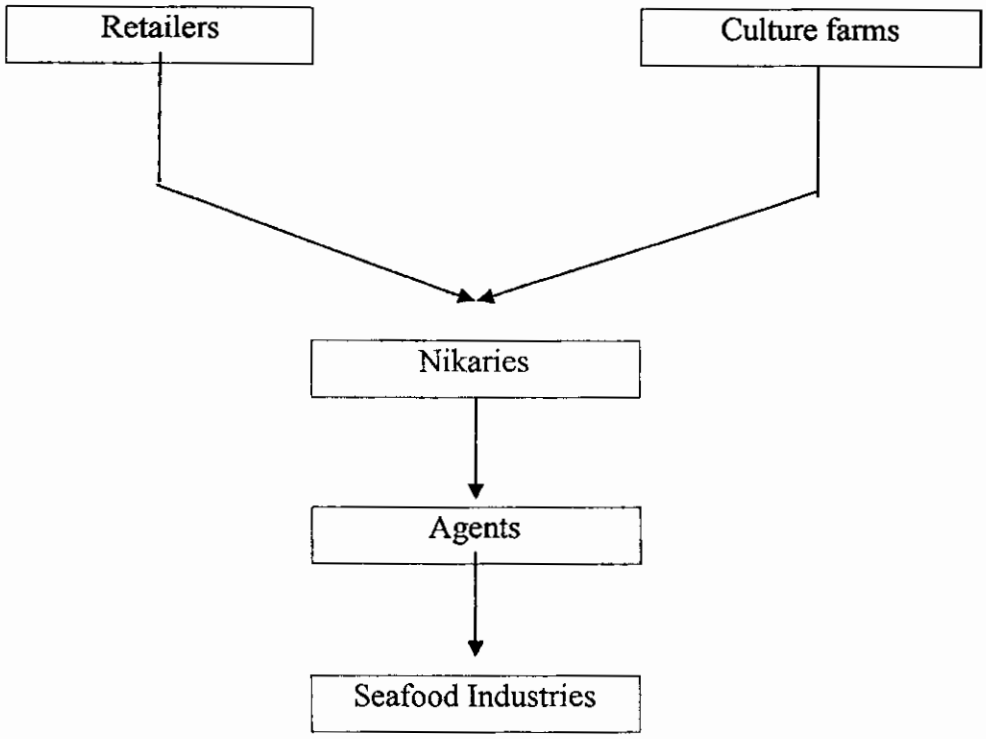
Production of frozen raw material is almost similar in the five industries investigated and one therefore commonly explained below.

4.1.3.1 Raw materials

Raw materials i.e., species used are the most important and desired component of seafood industry. White fish, Shrimps, Prawns etc. are used as the raw materials. Shrimps used by industries are Golda (*Macrobrachium rosenbergii*), Bagda (*Penaeus monodon*), Harina (*Metapenaeus monoceros*) and Chaka (*Penaeus indicus*). In case of white fish *Tenualosa ilisha, Labeo rohita Catla catla* etc. are mainly used as raw materials. Both headless and head on are brought to the industries as raw materials, depending on the buyers desire/preference. However, most of the species are headless -shell on. Mainly wooden boxes and bamboo baskets are used for transportation of raw materials with ice. The ratio between shrimp/prawns and ice during transportation depends upon the season. In summer, the ratio is 1 kg shrimp. 1 kg ice, while in winter the ration 1 kg shrimp: <1 kg ice.

The raw materials are brought from different districts, viz., Bhola, Barisal, Patuakhali, Mehendigange, Khepupara, Jhalokhathi, Narayanganj, Satkhira, Kaliganj, Bagerhat, Pirojpur, Khulna, Gopalgonj, Motheripur and Sundarban region. There are various number of agents engaged in raw materials supply to these industries. The means of transport to bring the fish to the industry are mainly by van, on head, pick-up and truck etc.

The following line diagram show the pathways of raw materials supplied to industries.



4.1.3.2 Production flowchart

Every industry has separate flowchart which is implemented. Common flow chart of production of headless shell-on block shrimp in the five industries investigated is shown in Fig-6. Common processing flow chart of Headless – shell on IQF shrimps, common processing flow chart of P & D shrimps, common processing flow chart of PUD shrimps, common processing flow chart of head on – shell on shrimps, Common processing flowchart of *Tenualosa* in sea food industries are shown in Fig-7, Fig-8, Fig-9, Fig-10 and Fig-11 respectively.

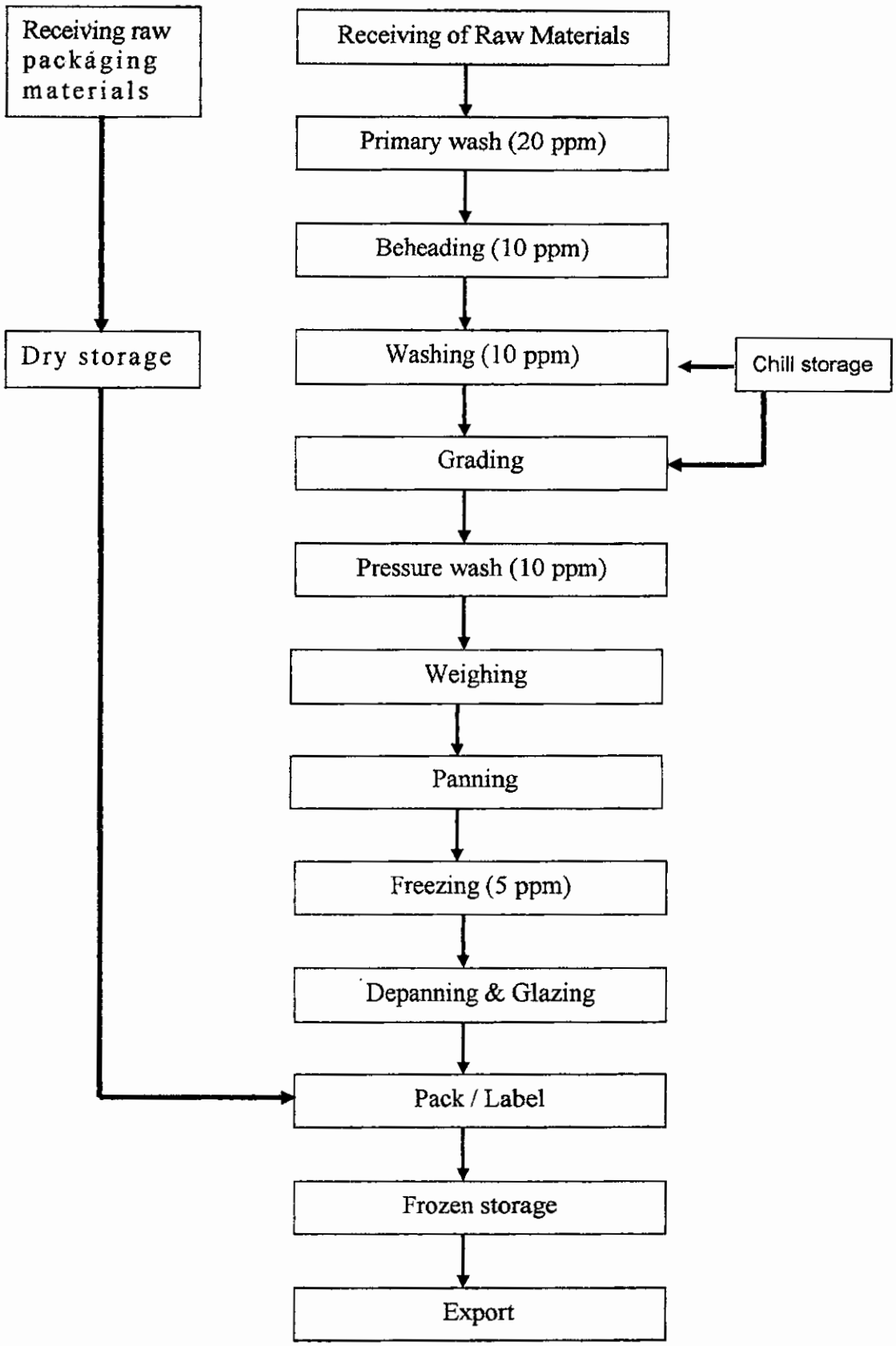


Fig-6: Common flow chart for processing of headless shell-on block shrimp

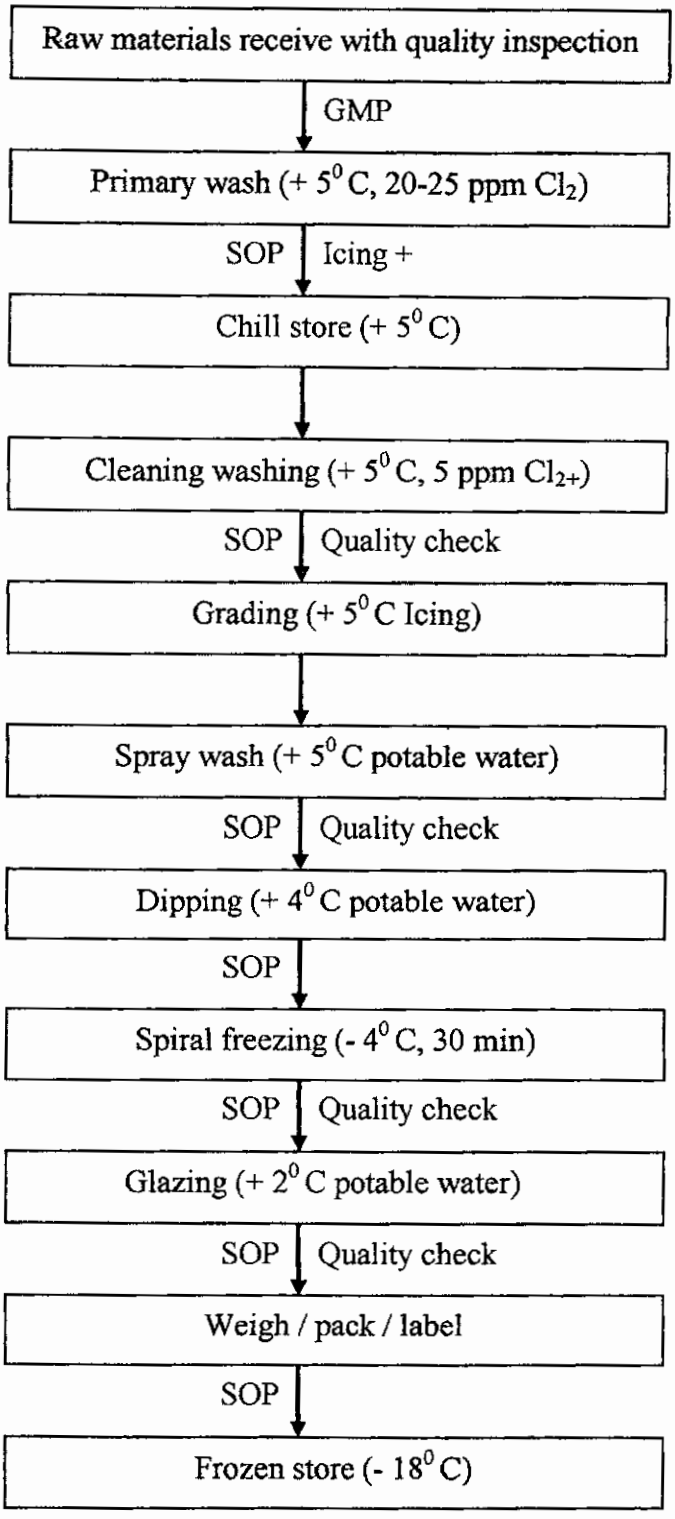


Fig-7: Common processing flow chart of Headless – shell on IQF shrimps

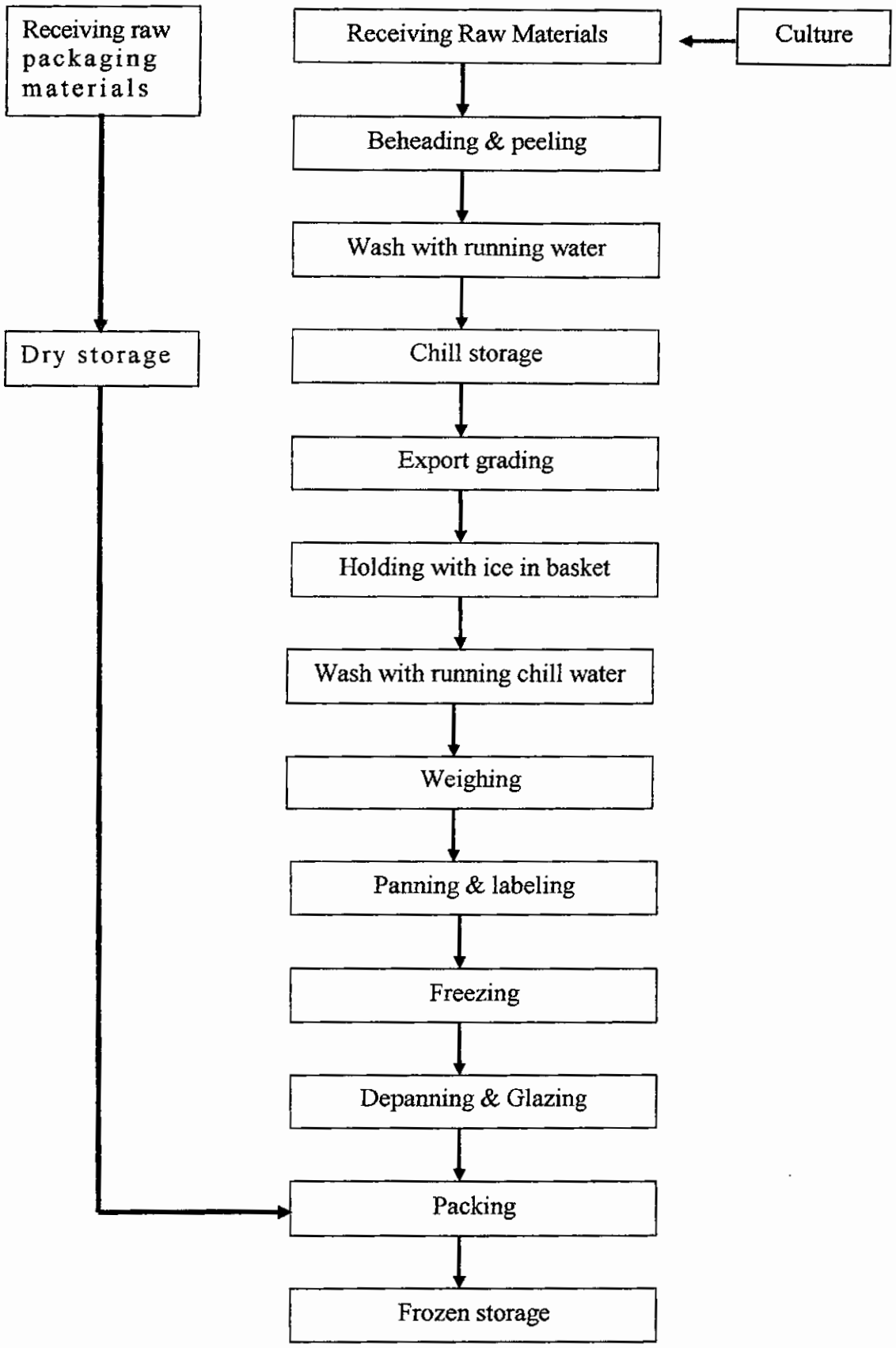


Fig-8: Common processing flow chart of P & D shrimps in Sea Foods industries

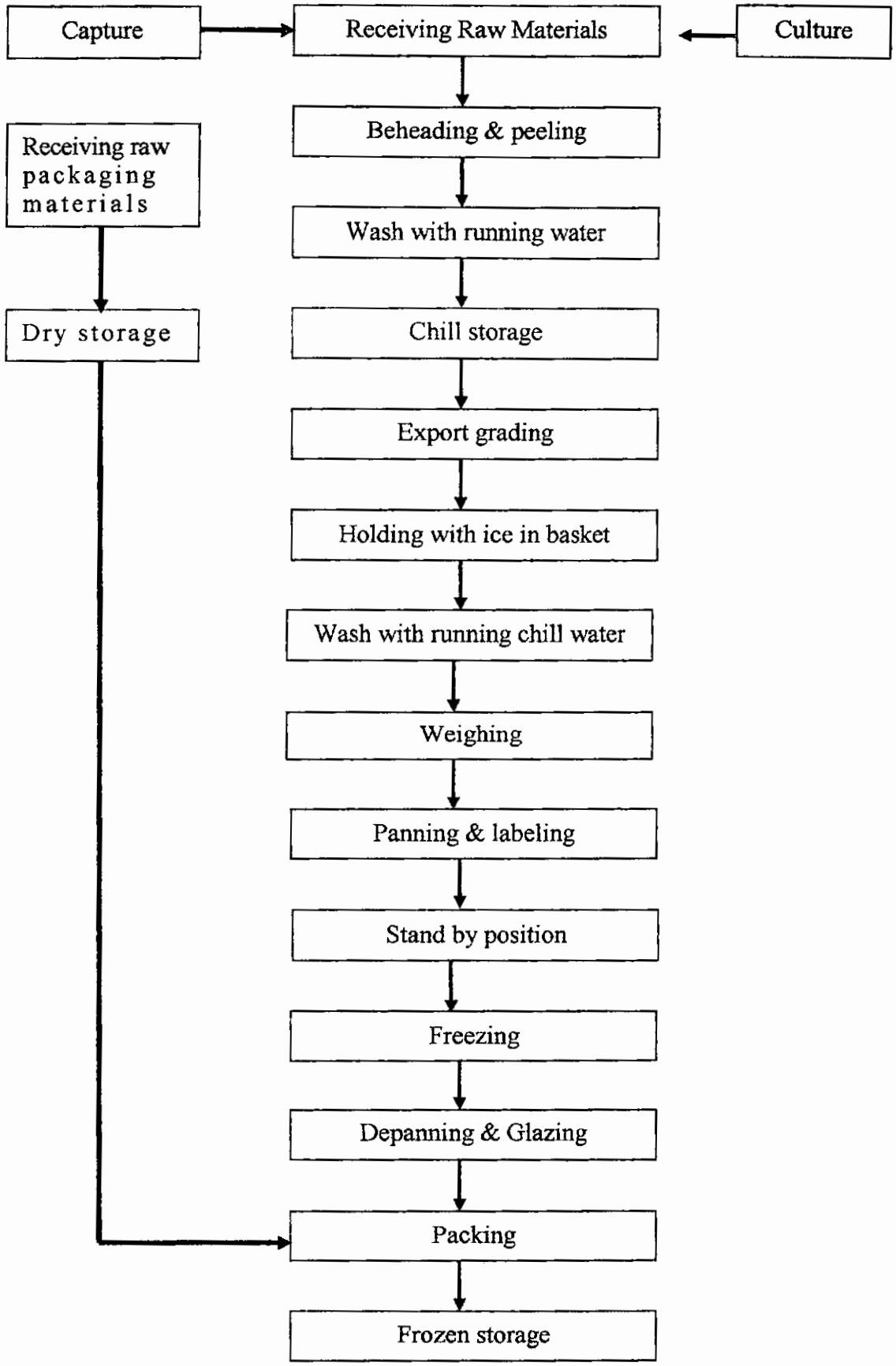


Fig-9: Common processing flow chart of PUD shrimps

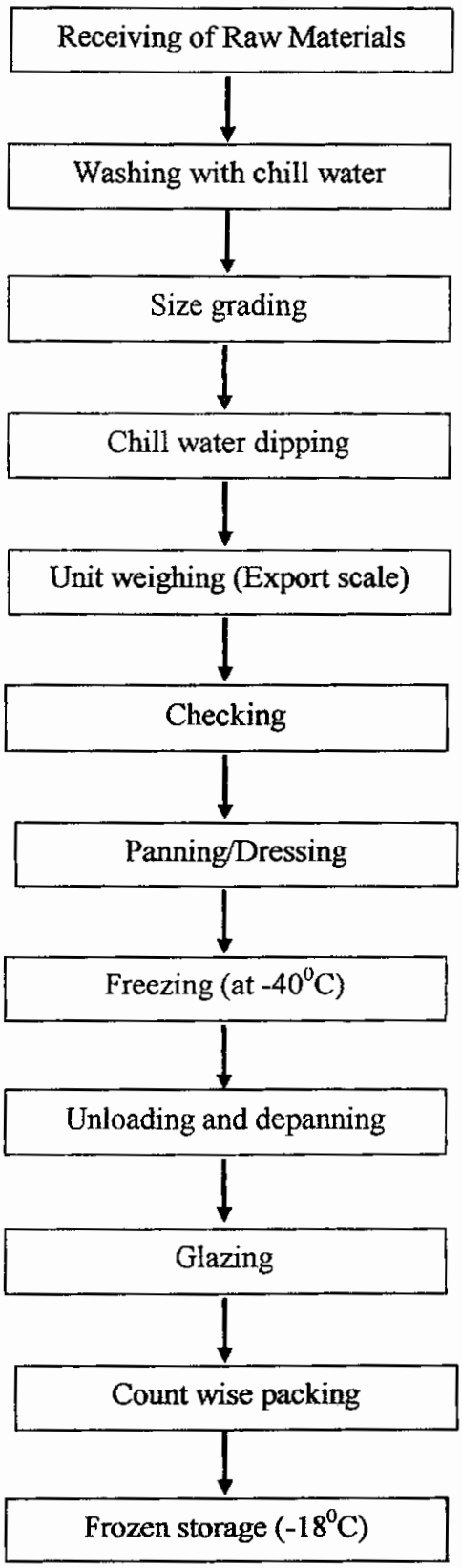


Fig 10: Common processing flow chart of head on – shell on shrimps

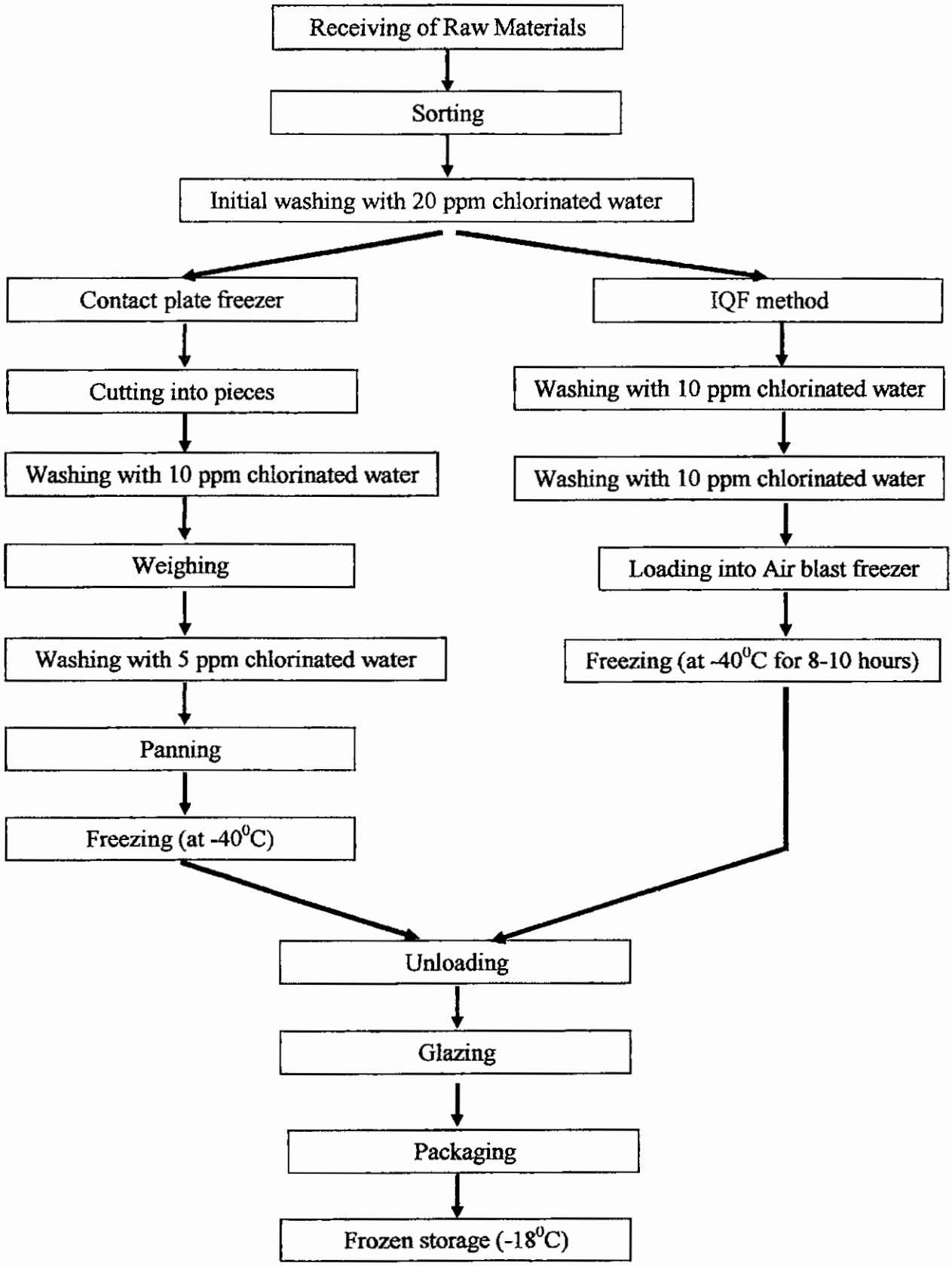


Fig 11: Common processing flowchart of *Tenualosa* in sea food industries

4.1.3.3 Landing section

All the seafood industries investigated had one landing section. However, in some big fish processing industries there are two/three landing sections. Raw materials brought via road, river is landed at the landing section. There are continuous chlorinated water flows at landing section.

4.1.3.4 Receiving room

Raw materials in baskets or wooden boxes are taken by the workers into the receiving room. Then the raw materials with ice are poured on the floor of the receiving room from the box or baskets. The workers in the receiving room are mainly hired by agents. Most of them are female. They work with a contract of 10 - 15 taka/basket. Some workers work with one basket at a time. The following tasks are mainly carried out at the receiving room:

- Separation of ice from raw materials.
- Initial sorting
- Hand grading
- Washing in case of peeled undeveined (PUD)
- Percentage observation.

4.1.3.5 Washing room

After purchasing the raw materials, they are transferred into the washing room. Here initial wash is done manually. Chlorinated water (ice chlorinated water) is used for washing the raw materials to remove the surface microbes. Also, chilled water is used in order to inhibit activity of microorganisms (Connell, 1975). Then the raw materials are transferred into chill room or grading section depending on the availability.

4.1.3.6 Grading section

In grading section, there are tables on which the washed shrimps are poured. Grading is done by experienced workers who are designated as graders. There are numbers of graders who work under a contractor. Graders are divided into senior and junior, their salary depending upon seniority. 8 - 10 graders grade the shrimps manually in each table. After grading shrimps are kept in different containers with required amount of ice. These shrimps are then transferred to cleaning section.

4.1.3.7 Cleaning section

The cleaning sections are attached with grading section. In this section, usually female workers clean the following materials:

- Hanging meat
- Pat of intestine
- Portion of carapace
- Externs materials

Here shrimps are again kept into the containers with proper ice. The soft shell spotted and damaged shrimps are separated.

4.1.3.8 Processing section

Processing section is the main unit of any seafood industries. Processing by contact plate freezer is usually carried out by most industries. However, some seafood industries have Air Blast Freezer, IQF and CPD (Cooker, Peeled & Deveined) method. BASFIL, DFL and BSFIL had IQF. MUSFL has Air Blast Freezer while SFL has only contact plate freezer. Before processing raw materials are washed through pressure washing and weighed according to respective grades.

4.1.3.9 Pressure washing

The containers full of cleaned raw materials are taken into the pressure washing section Raw materials are poured into the tray by a plastic bowl from the container. Chlorinated water is forced and applied to the product. Part of intestines, different dirty materials which are attached to the shrimps are washed away by this process.

4.1.3.10 Weighing

After pressure washing, the shrimps are brought to the weighing section. Electronic weighing machine is used for this purpose. After weighing the shrimps are kept into small containers with their grad numbers. These containers are then transferred into contact plate freezer section/IQF section/air blast freezer section.

4.1.3.11 Freezing procedures

After final weighing, the shrimps are taken for freezing. Freezing is usually done by the panning section is the main unit of contact plate freezing. Here the female workers are mainly used.

The shrimps washed through chlorinated water. These are then kept in a small pan. The female workers assemble these shrimps into leach pan. Before this work, the pans are washed and a polyethylene paper is placed on the pans. After assembling, one pot of chilled water is poured into the polyethylene. Then four or five pans are placed into a tray. Trays are placed into the contact plate freezer.

Each freezer has a meter showing temperature. The duration of freezing varies between $1^1/_2$ to $1^3/_4$ hours. When the meter shows - (34 to 40)^{0}C, then the temperature inside the block reaches to - 18^{0}C. Pans are then unloaded from the freezer. Table-6 shows the no. of Contact plate freezer, Air blast freezer, IQF and their capacity of the five seafood industries investigated.

After final weighing, the shrimps are placed into the IQF section with individual grading basket. At first, these shrimps are washed with chlorinated chill water. The workers assemble the shrimps on the conveyer belt though which the products enter into the IQF. There is a general rule to operate the machine for eight hours, but some seafood industry continues 12 - 14 hours. Then the machine is stopped for defrosting for 30 minutes. One hour after defrosting the operator starts the machine again and within one a half hour the machine reaches its maximum speed. After reaching the maximum speed, the production starts when the meter shows - (20^{0}C to 35^{0}C). In Air blast freezer, air at a temperature of - (35^{0}C to 40^{0}C) is blown over the product at speed ranging from 5 - 5 meter/second. The freezing time is about five hours. Mainly white fish are processed by this method. Some time large size head on shrimps are also processed.

Freezing time and temperature varies with species, type of freezer etc. In contact plate freezer, freezing times varies $1^1/_2$ - $1^3/_4$ hours. And the temperature varies between - (35^{0}C to 40^{0}C). In IQF machine, temperature varies between - (20^{0}C to 35^{0}C) freezing time varies with grade 4/5 grade require highest temperature. Usual required time is forty minutes.

In air blast freezer, the freezing time is a great disadvantage for processing because it varies between 5 - 12 hours. The temperature varies between - (35^0C to 40^0C). The freezing time and temperature of different freezer used in different seafood industries which has air blast freezer.

Table-6: Number of Freezers and their capacity

Sl. No.	Name of Seafood Industries	Types of Freezer	No. of Freezer	Capacity of Freezer
1.	Bangladesh Sea Food Ind. Ltd.	Contact Plate Freezer	3	900 kgs/load
				800 kgs/load
				600 kgs/load
		IQF	1	600 kg/40 minute
2.	Southern Foods Ltd.	Contact Plate Freezer	3	1000 kgs/load
				900 kgs/load
				600 kgs/load
3.	Bagerhat Sea Food Ind. Ltd.	Contact Plate Freezer	3	1000 kgs/load
				1000 kgs/load
				1000 kgs/load
		IQF	1	650 kg/40 minute
4.	MU Sea Foods Ltd.	Contact Plate Freezer	3	8 ton/day
		Air Blast Freezer	2	15 ton/day
5.	Delta Fish Ltd.	Contact Plate Freezer	3	1000 kgs/load
				800 kgs/load
				600 kgs/load
		IQF	1	500 kg/load

4.1.3.12 Unloading and reglazing

After completion of freezing, the products are unloaded from the freezer. Then reglazing is done if necessary. In case of IQF, the unloading and reglazing are automatically completed. In case of CPF, the unloaded pans are reglazed in air blast freezer after passing through a light water shower.

4.1.3.13 Thawing

Fennema (1966) has pointed out that thawing is inherently slower than freezing and follows a pattern that is potentially more detrimental. For this purpose, the frozen materials are placed in normal water for a long time. Generally pan products or block are thawed in industries for producing IQF products.

In peak season, huge amounts of raw materials are received by industry. All these raw materials can not be frozen by IQF machine at a time. At that time, these are frozen by contact plate freezers. When the buyers require IQF product, then block products are turned into IQF products through thawing.

4.1.3.14 Packaging section

4.1.3.14.1 Packaging materials

Usually, polyethylene bags, thick paper boxes and carton are used as packaging materials in seafood industries.

4.1.3.14.2 Types of pack for freezing

In the five seafood industries investigated, the following types of pack for freezing are done depending upon the buyers demand.

(i) **Headless Shell on/Raw Headless/HL**

In this type of pack, the heads along of the prawns are removed, leaving the entire shells and tail intact. The vein is pulled out as far as possible from the severed head portion. Only larger size grades of fresh prawns are generally utilized in this method.

(ii) **Peeled & Deveined (P&D)**

The head, shell, tail and the so-called vein passing through the dorsal side are completely removed and the edible meat along is used. When the prawns are slightly stale as indicated by the fading of the fresh colour of the shell, black spot formation etc. and when the size is comparatively smaller, they are used in this type of pack.

fastened tied with synthetic strapping using a strapping machine. Theses are then stored in frozen storage at - 18^0C. Packing is essential to preserve and distribute frozen fish or shrimp. In case of IQF products the inner cartons are made of polyethylene bag. Four inner cartons are packed in one master carton which is made of pitch board. All cartons are printed with various specifications and carton binding is same as that of pan products.

4.1.4 Brand name

Seafood industries normally provide brand name of their carton. Brand name is very important with regarding to marketing in international trade. The brand names once regarded as popular, enters the international market easily and the industry thus earns a huge amount of foreign exchange.

Bangladesh Sea Food Ind. Ltd. has their brand name as stated below:

1. Rani
   Frozen shrimps/prawns

Southern Foods Ltd. has their brand name as stated below:

1. Ideal
2. King
   Frozen shrimps/prawns

Bagerhat Sea Food Ind. Ltd. has their brand name as stated below:

1. Ocean Star
   All kinds of frozen shrimps/fish

MU Sea Foods Ltd. has their brand name as stated below:

1. Conch
   All kinds of frozen shrimps/fish

Delta Fish Ltd. has their brand name as stated below:

1. Royal
   All kinds of frozen shrimps/fish

Most industries carry out manual process of binding except for BASFIL where carton binding is done automatically. In BSFIL and DFL, carton binding is done manually and semi-automatically while in MUSFL and SFL, carton binding is fully manual (Table-7).

Table 7: Process of carton binding and brand name

Sl. No.	Name of Seafood Industries	Process of Carton Binding	Brand Name of Carton
1.	Bangladesh Sea Food Ind. Ltd.	Automatically	SEA GOLD
2.	Southern Foods Ltd.	Manually	IDEAL, KING
3.	Bagerhat Sea Food Ind. Ltd.	Manually and Semi-auto	OCEAN STAR
4.	MU Sea Foods Ltd.	Manually	CONCH
5.	Delta Fish Ltd.	Manually and Semi-auto	ROYAL

4.1.5 Cold storage

After the shrimps and prawns are packed in master carton, they are stored for several months or days until shipment at a temperature of - (18^0C to 22^0C). In cold storage packages are stored on wooden dons, the distance between two dons is six inches. The advantages of wooden don is that cold air passes through the surrounding packages easily and thus keeps the temperature of the product as low as possible. There are various numbers of cold storage. Arrangement of cartons in cold storage.

- Different grade and species at different side
- P & D and PUD are arranged at the top

Most of the labourers of cold storage are male who work under a supervisor. Table-8 indicates the number of cold storage room with their capacity. It is found that BSFIL and MUSFL have the highest number of cold storage while BASFIL has the highest capacity.

Table 8: Number of cold storage and capacity of the cold storage

Sl. No.	Name of Seafood Industries	Number of cold storage	Capacity
1.	Bangladesh Sea Food Ind. Ltd.	4	650 ton
2.	Southern Foods Ltd.	3	325 ton
3.	Bagerhat Sea Food Ind. Ltd.	5	220 ton
4.	MU Sea Foods Ltd.	5	450 ton
5.	Delta Fish Ltd.	3	350 ton

4.2 Status of female workers

4.2.1 Age distribution

The age distribution of female workers was same in all the sea food industries. The age limit of 25-29 was the highest in all the industries. The age limit of 40-60 was the lowest in BSFIL, DFL, MUSFL and SFL but in BASFIL the lowest lied between the age limit of 35-39 (Fig-12(a)).

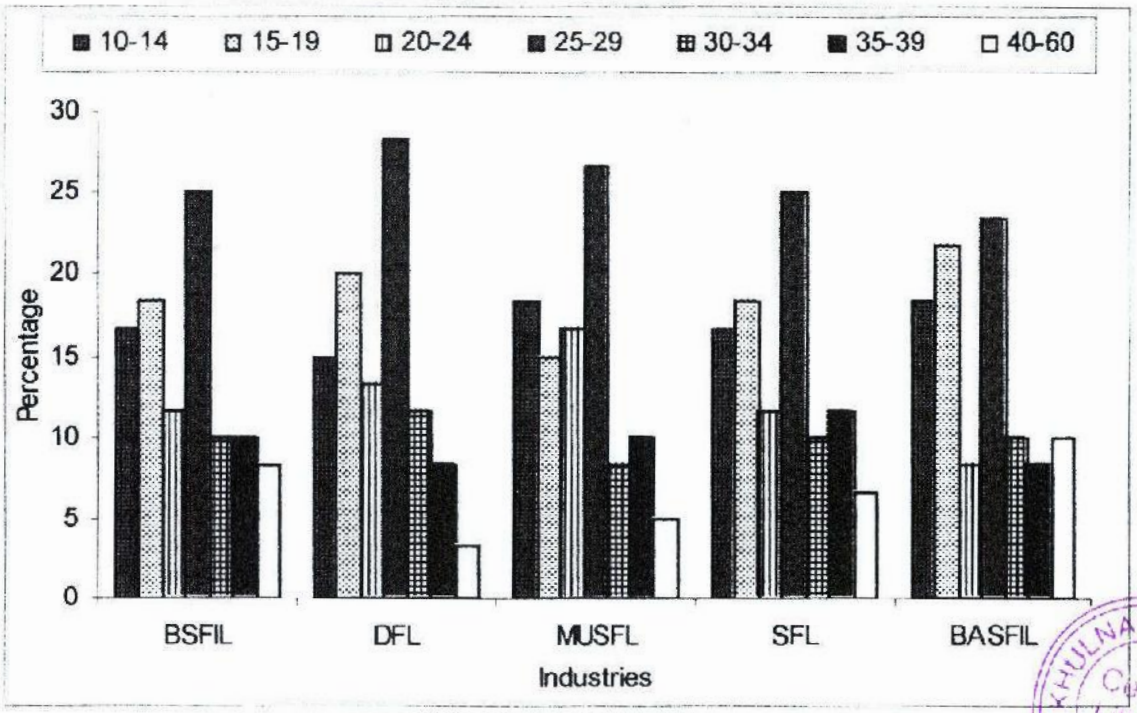


Fig-12(a): Age distribution of female workers in different sea food industries

Majority of the workforce was found to be young and 55% covered the age limit of 15-29 while 7% of the workers were within the age limit of 40-60. Among the all age group the individual highest percentage (25%) of workers lied between the age limit 25-29 while lowest was 7% (age limit of 40-60). Islam (1975) found that about 80 percent working women are in 21-40 years age limit in garment industries. Salauddin and Shamim (1992) found that the dominated majority were in 21-40 age group (Fig-12(b)).

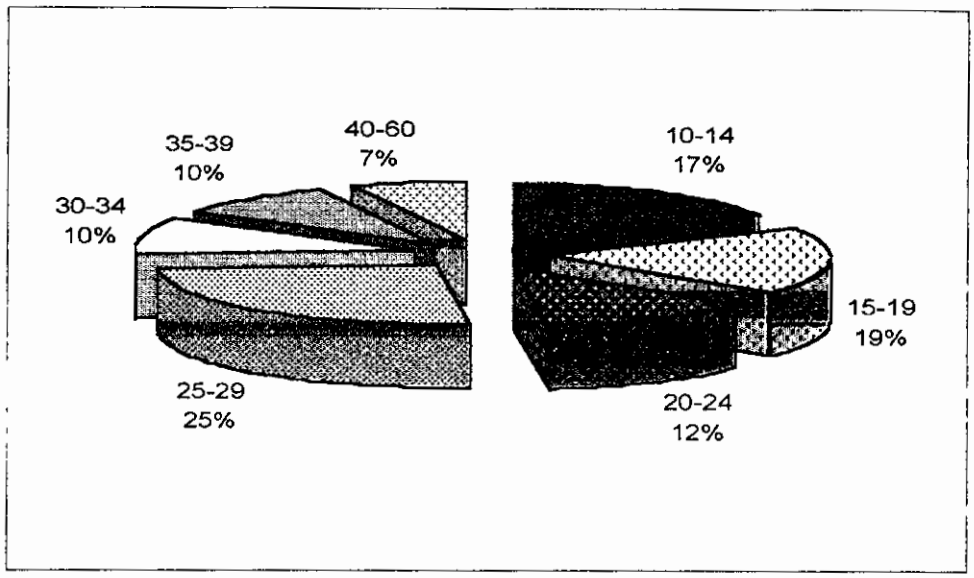


Fig-12(b): Age distribution of female workers

4.2.2 Religious status

Fig-13(a) shows that most of the female workers were Muslims and the rest were of Hindus. Only in two industries (DFL and BASFIL) 2 Christian females (one from each industry) were observed. Above 80% of Muslim workers were observed in all the four industries except MUSFL (65% Muslim and 35% Hindus) because the owner of MUSFL was a Hindu. Among the five industries, the highest percentage Muslims were found to be in BSFIL (93.33%) while lowest in MUSFL (65%).

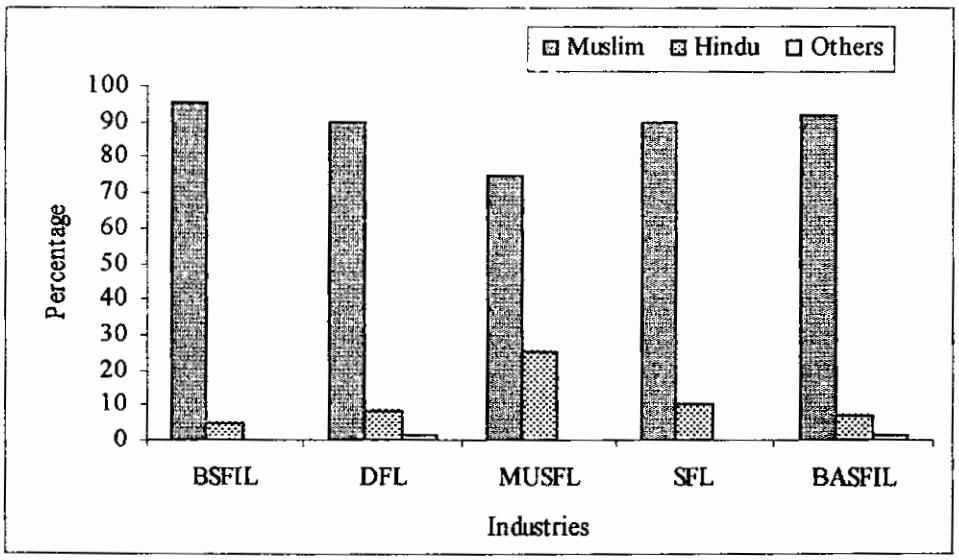


Fig-13(a): Religious status of female workers in different sea food industries

Fig-13(b) reveals that most of the female workers were Muslims (88%) while the rest of them were Hindu. Only two Christian women were found working in two industries. The ratio of women from different religion communities found in the study area supports the overall religion ratio of Bangladesh.

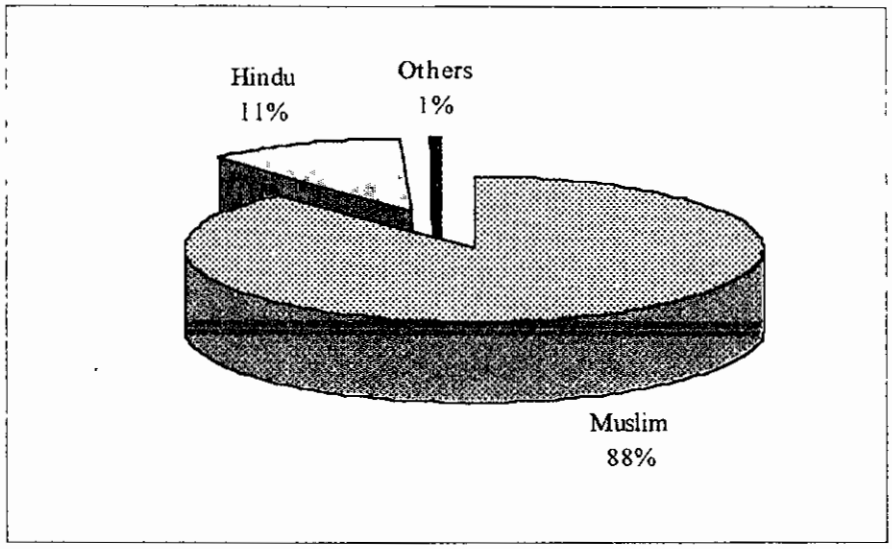


Fig-13(b): Religious status of female workers

4.2.3 Marital status

Marital status of the female workers of different sea food industries is shown in Fig-14(a).

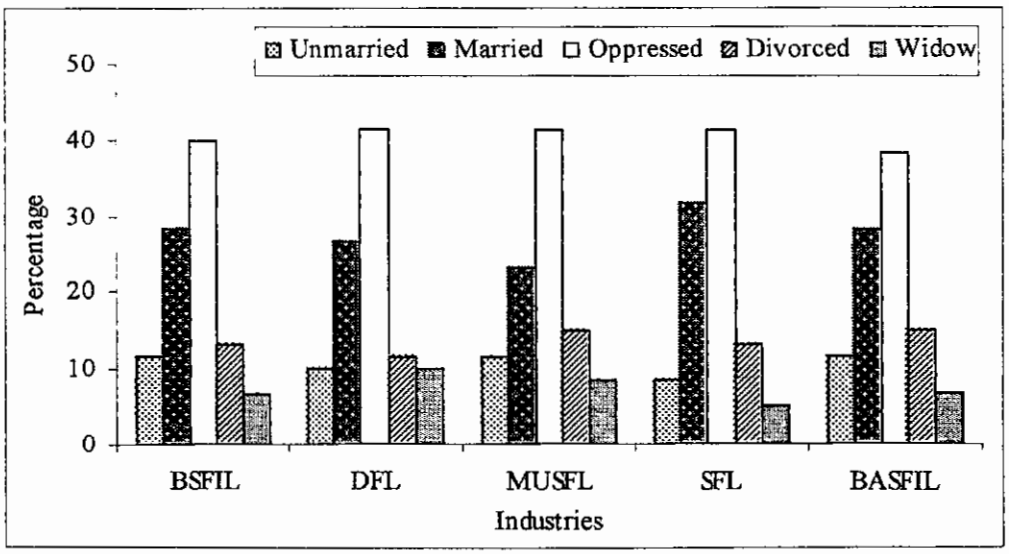


Fig-14(a): Marital status of female workers in different sea food industries

From the survey, it has been found that above 50% females were oppressed and divorced by their spouses (Fig-14(b)). Of the total 300 female only 10.67% were unmarried and 7.33% widow. The results revealed that 27.67% women were married and lived with their spouses.

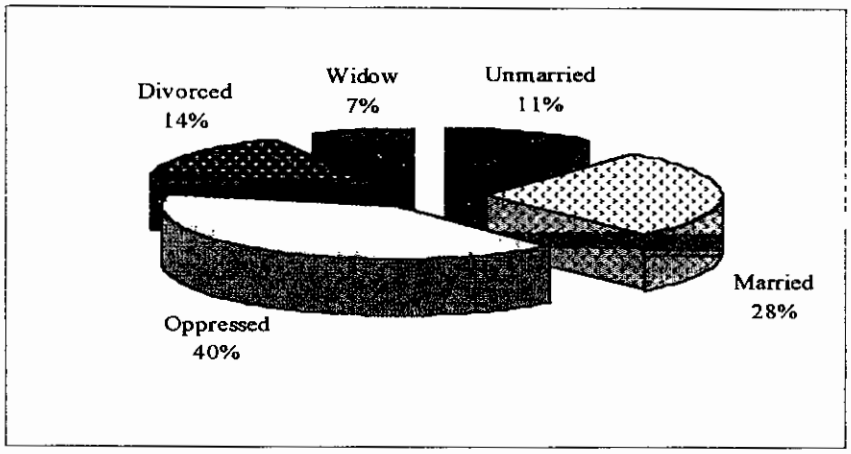


Fig-14(b): Marital status of female workers

4.2.4 Education level

In sea food industries female workers play an important role in quality control of the processed product and work in vital section of the industry. But the educational status of the women workers of the sea food industries is not good and impressive. Fig-15(a) shows that the highest numbers of illiterate females were found in MUSFL (65%) while lowest in DFL (51.67%). Above 45% women were literate as the concept of literacy related to signature was concerned except MUSL.

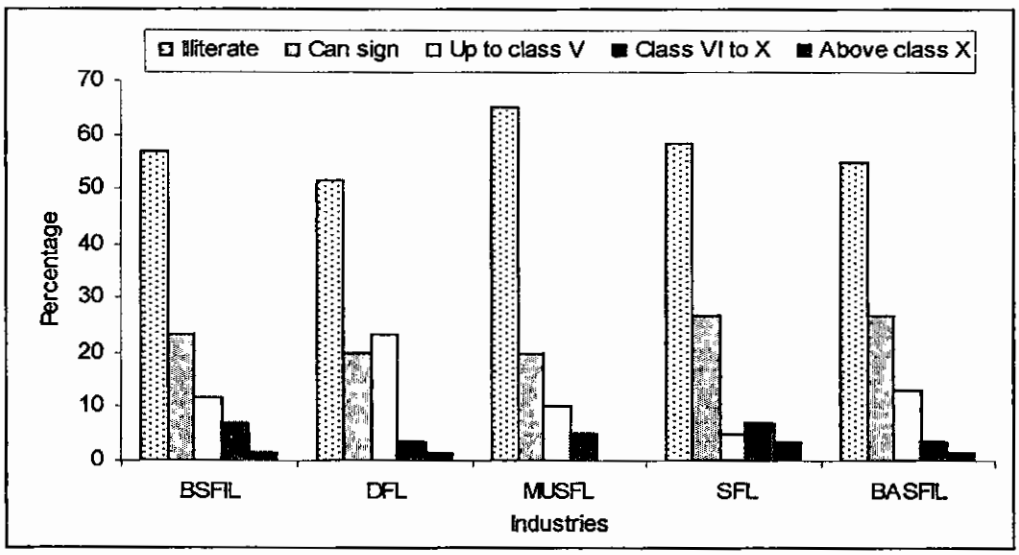


Fig-15(a): Education level of female workers in different sea food industries

Fig-15(b) shows that 57% of the women workers are completely illiterate and 23% can sign only respectively. It is clear that the formal education is extremely in critical position in poor working women. The literacy rate was much below than that of the national literacy rate which accounted to about 76% (BBS, 2002). About 75% of females left from school before passing class VIII.

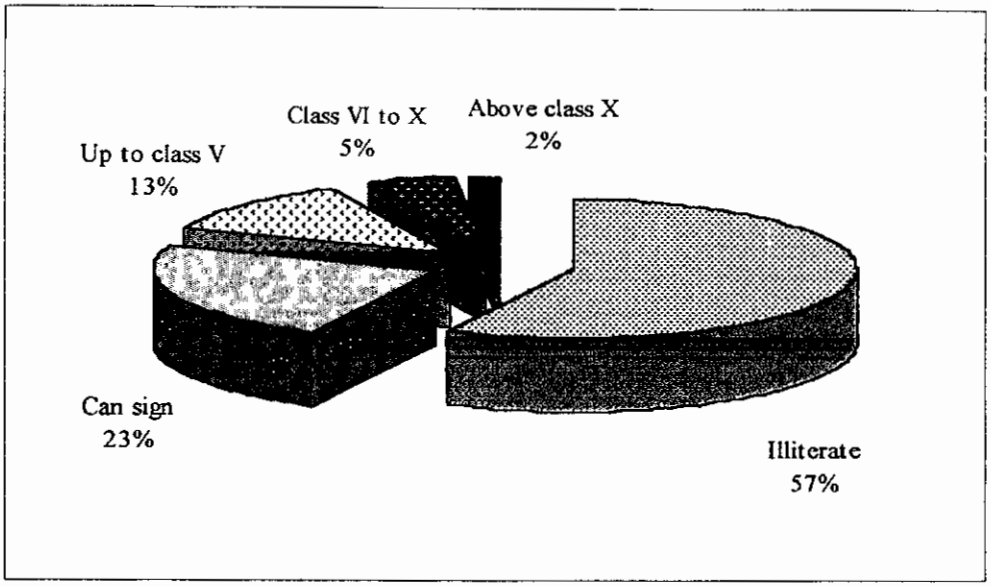


Fig-15(b): Education level of female workers

4.2.5 Family types

Type of family in relation to their environment is an important factor to consider the family. This factor is one of the causes for the female workers to join industries. Among the five industries, the highest percentages (78.33%) of single families were to be found in BSFIL while lowest (51.67%) in BASFIL (Fig-16(a)).

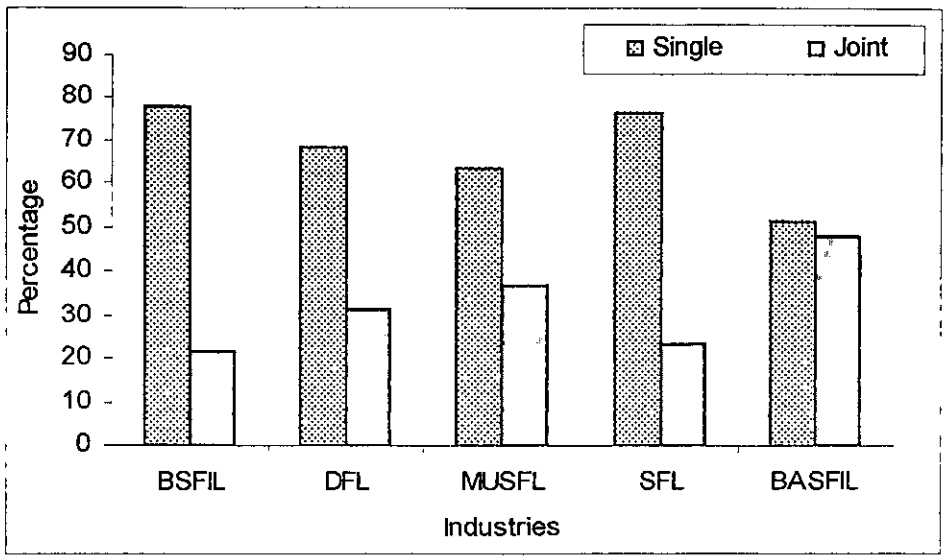


Fig-16(a): Family types of female workers in different sea food industries

The survey results have shown that most of the females had single family. 68% of the female workers had single family and the rest (32%) had joint family (Fig 16(b)).

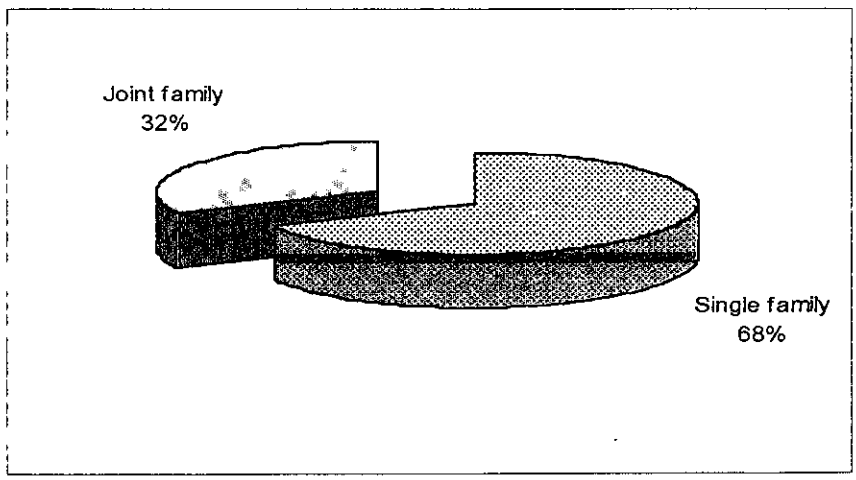


Fig-16(b): Family types of female workers

4.2.6 Family size

Family size is a very important parameter determining the socio-economic as well as living condition of female workers. In Bangladesh about 48% of the total population is female (BBS, 2002). The results revealed that most of the female workers family consisted of 3-4 members. Among the five industries it was highest in MUSFL and lowest in BSFIL (Fig-17(a)).

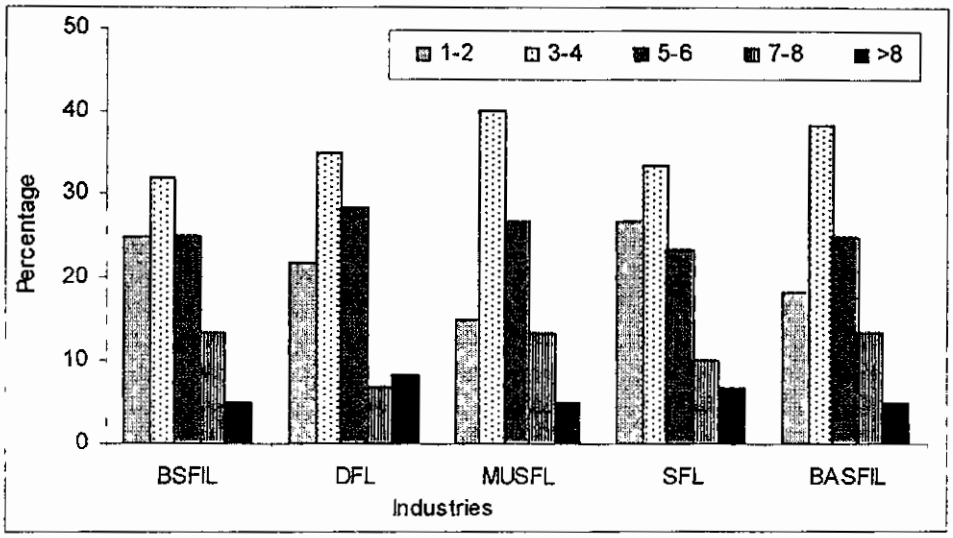


Fig-17(a): Family size of female workers in different sea food industries

Fig-17(b) shows that 36% female workers had families consisting of 3-4 members, 26 % 5-6, 21% 1-2 and 11% 7-8 members in their family. According to this study most of the female workers had families consisting of 3-4 family members which was lower than the national average of 5.6 person / house (BBS, 2002).

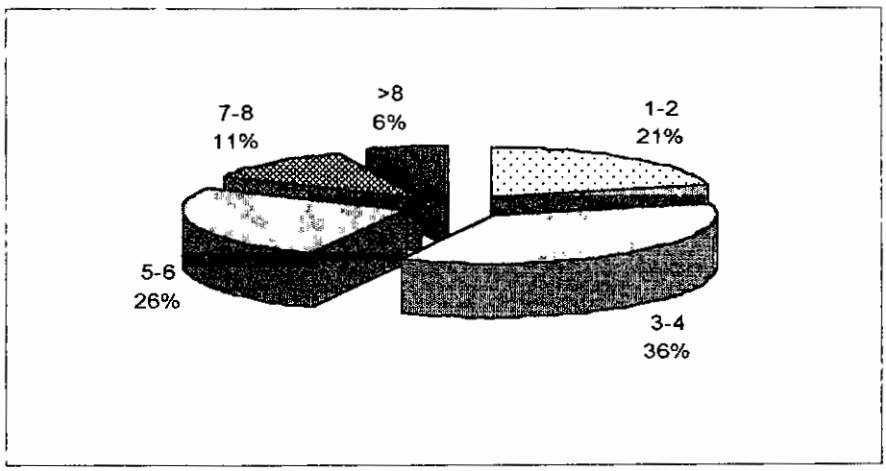


Fig-17(b): Family size of female workers

4.2.7 Origin of female workers

Fig-18(a) shows that above 80% female workers of all the five industries lived in rural area. DFL is the only one industry where 100% were rural workers. This is attributed to the fact that it was is situated in rural area (20 km away from Satkhira district town). The highest percentages (21.67%) of urban female worked in BSFIL.

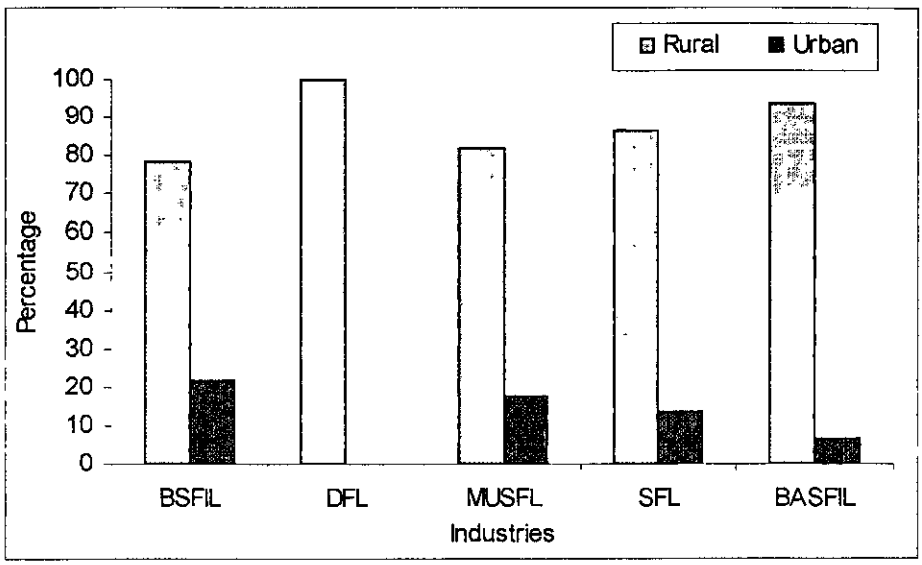


Fig-18(a): Origin of female workers in different sea food industries

Fig-18(b) shows that 88% of the female workers were from rural origin and the rest (12%) were urban origin. Most of the poor women migrate from rural to urban region in order to get a job, social security and protection. Besides these, divorce, widowhood, remarriage of husband, violence of husband, social disturbances etc. are responsible for women migration from rural to urban areas (Afsar, 1992).

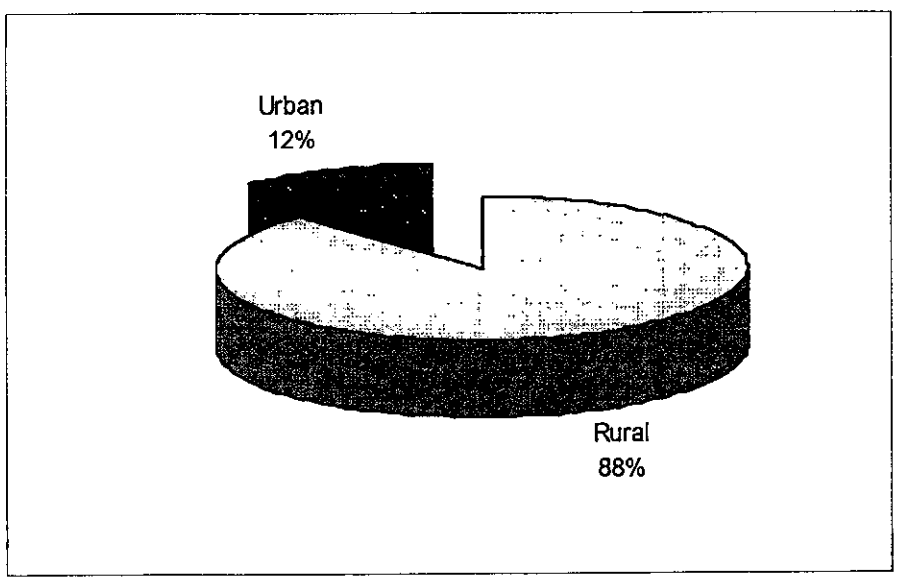


Fig-18(b): Origin of female workers

4.2.8 Factory Norms Regarding recruitment and work schedule

4.2.8.1 Mode of recruitment

The results show that above 60% workers were recruited by the contractors in the five sea food industries as shown in Fig-19(a). About 10% of the female workers were recruited as permanent employee by the five industries. The highest number of permanent female workers were found in SFL while lowest were in DFL. The rest of female workers were found recruited by their relatives.

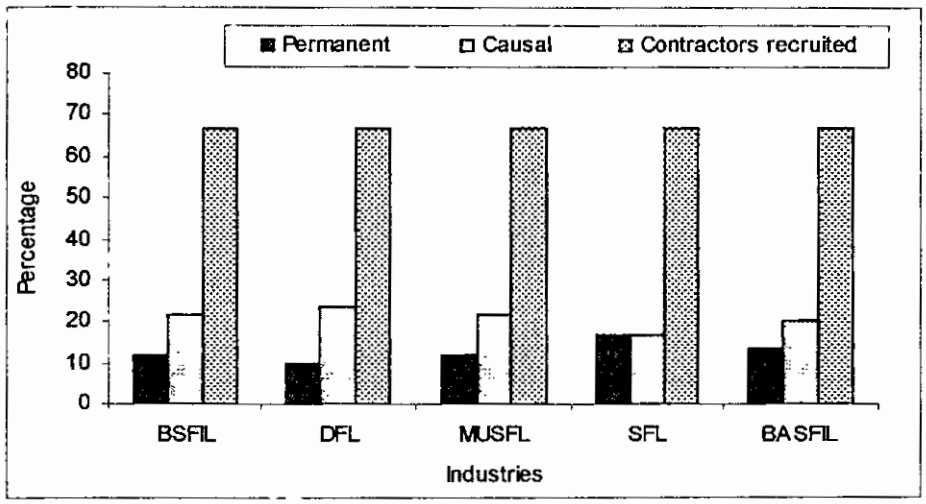


Fig-19(a): Mode of recruitment of female workers in different sea food industries

In Fig-19(b) it is observed that out of 300 female workers, 66% were recruited by the contractors, 21% were recruited as causal employee and only 13% of the female workers were recruited as permanent employee.

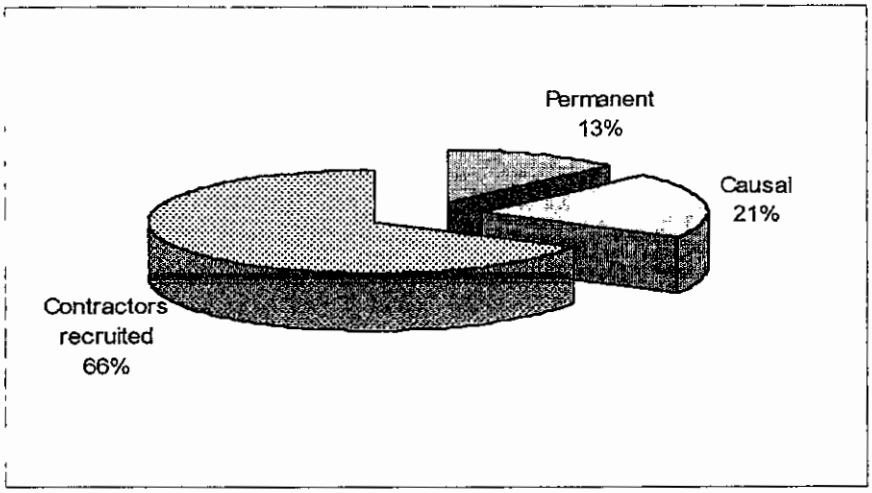


Fig-19(b): Mode of recruitment of female workers

4.2.8.2 Work hour

Working hours varied depending on the availability of raw material and raw materials availability depended on the lunar cycle. In new and full moon, the working hours were high. Two shifts of work were a norm in all the industries of the country. First shift started more or less at the same time (7.30-8.00 am). Fig-20(a) shows that in all the surveyed industries the work hours were in similar pattern and work hours varied between 6-8 hours. The working hours between 8-12 hours were found to be above 75% in all the industries. Among the five industries, highest percentages (86.67%) were found in DFL while lowest in MUSFL (75%). These types of workers were recruited by the contractors. It was also found that a few of the workers worked more than 12 hours.

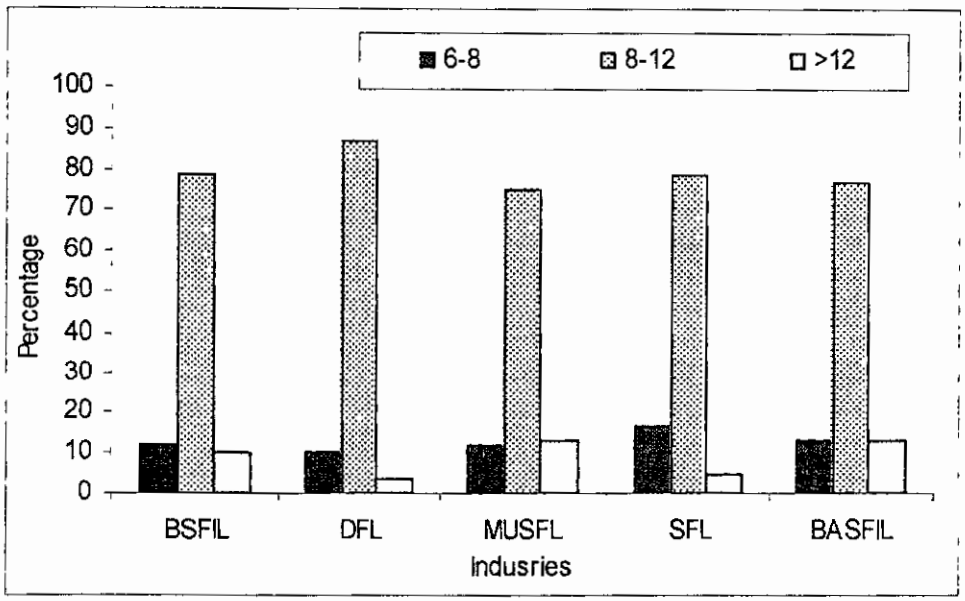


Fig-20(a): Working hour of female workers in different sea food industries

Fig-20(b) shows that on an average, a female worker had to work 10 hours a day. During the peak season, a worker had to work even in weekly holidays (applicable only in case of permanent worker) although they were paid for overtime work on holidays; no alternate holidays were however given. It was found that 78% of the female workers had to work for 8-12 hours a day while 13% work for 6-8 hours and 9% work for above 12 hours. In this issue, Afsar (1992) found that women work for longer period (51 hours/week compared to 49 hours/ week for men) but they still get very low wages, nearly one-fourth of males wage.

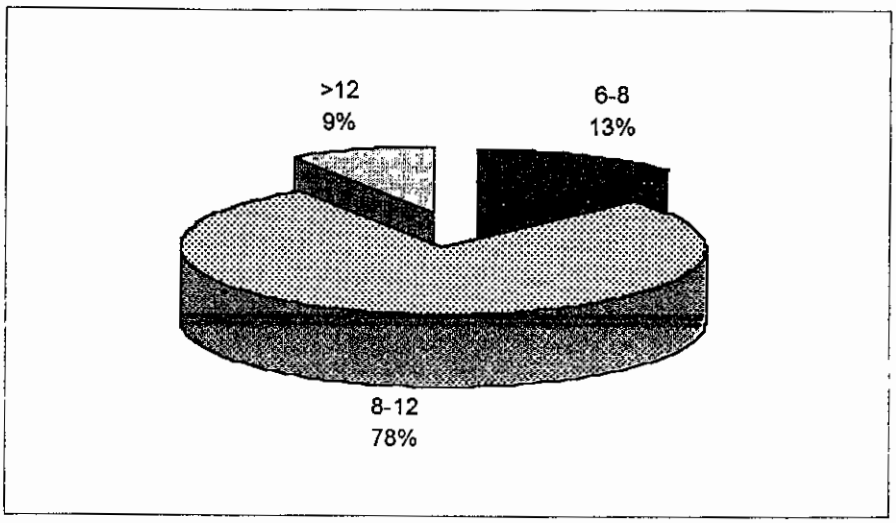


Fig-20(b): Working hour of female workers

4.2.8.3 Breaks during works

A morning tea-break or breakfast (15 minutes) were to be found in only two industries (BSFIL and SFL) among the surveyed industries (Table-17). All the five industries provided more or less lunch time (30 & 45 minutes). Among the five industries the permanent female workers of two industries (BSFIL and SFL) had 45 minutes lunch time while the other three industries gave 30 minutes. All industries surveyed provide lunch room and prayer facilities.

4.2.8.1. Weekly holiday

Table-17 also shows that the permanent workers in all the five industries surveyed had weekly holidays while the casual and contractor's recruited women did not get any weekly holiday.

Table-17: Work schedule and facilities

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Breakfast time												
15 minutes	60	100	#	#	#	#	60	100	#	#	120	40
Lunch time												
30 minutes	53	88.33	60	100	60	100	50	83.33	60	100	283	94.33
45 minutes	07	11.67	-	-	-	-	10	16.67	-	-	17	5.67
Total	60	100	60	100	60	100	60	100	60	100	300	100
Prayer facilities												
Yes	60	100	60	100	60	100	60	100	60	100	300	100
No	-	-	-	-	-	-	-	-	-	-	-	-
Total	60	100	60	100	60	100	60	100	60	100	300	100
Weekly holiday												
Yes	07	11.67	06	10	07	11.67	10	16.67	08	13.33	38	12.67
No	53	88.33	54	90	53	88.33	50	83.33	52	86.67	262	87.33
Total	60	100	60	100	60	100	60	100	60	100	300	100

#= no facility of breakfast

4.2.9 Factory norms regarding earning and related aspects

4.2.9.1 Monthly earnings

The female workers of the quality control section earned highest salary (Tk.1800.00-2600.00/month). Table-18 shows that the monthly earning of export graders was high in all the five industries surveyed and ranged between Tk. 1800.00 – 2400 per month while lowest in sorting section (Tk. 1400.00 – 1800.00 per month). Among the five industries, the highest salary (Tk. 2600.00/month) was provided by BSFIL while lowest salary (Tk. 1400.00/month) by DFL. This excluded overtime payment. Table-18 also shows that the level of income was comparatively higher in BSFIL and SFL. These results show similarity to the result of Salahuddin and Shamim (1992) where they showed that the level of income of women workers were very low (average 1499 Tk./Month).

Table-18: Monthly earnings (Contractor's employee, without overtime pay)

Job category	BSFIL (Tk./Month)	DFL (Tk./Month)	MUSFL (Tk./Month)	SFL (Tk./Month)	BASFIL (Tk./Month)
Sorting	1200-1500	1500-1600	1000-1200	1500-1800	1200-1600
Grading	1500-1800	1500-2000	1500-1800	1600-2000	1500-1800
Beheading	1200-1500	1200-1500	1000-1200	1200-1500	1200-1500
Peeling	1000-1200	800-1200	800-1200	1000-1200	800-1200
Washing	1000-1200	800-1200	1000-1200	1000-1200	1000-1200
Panning	1200-1500	1000-1200	1200-1500	1200-1500	800-1200
Glazing	1000-1200	1000-1200	800-1200	1000-1200	1000-1200
Packing	1500-1800	1200-1500	1200-1500	1500-1800	1200-1500

4.2.9.2 Overtime rate and workers attitude towards overtime

According to the Factory Act 1965, no person can be employed for than 8 hours a day in a factory. Work in excess of these hours should be paid for at the overtime rates, which is twice the basic salary. Usually, the basic salary is considered to be 60% of the monthly pay but no industry followed this act. Interestingly, none of the workers knew what their basic salary is. They reported their monthly pay as their basic salary. It has clearly been observed that the overtime rates varied low to high between day and night. The overtime rates were found Tk.12.00 per hour as highest and Tk.5.00 per hour as lowest. Among the five industries the highest overtime rates were found in SFL and lowest in DFL, MUSFL and BASFIL (Fig-21).

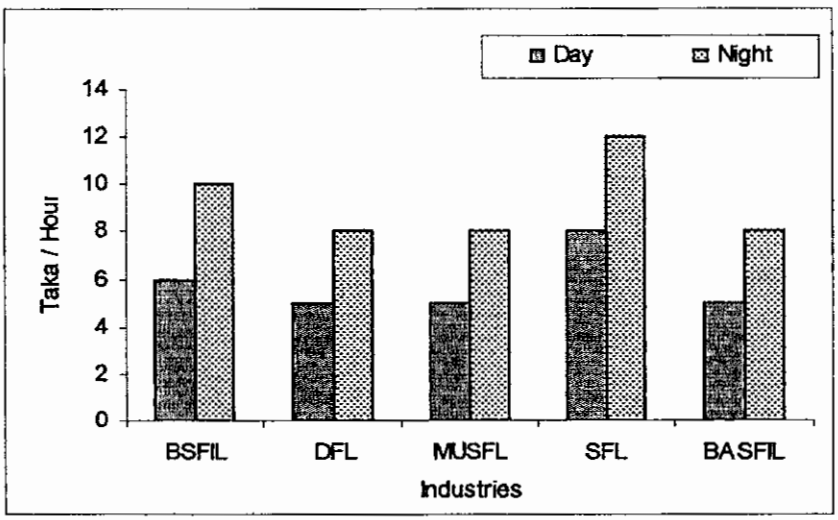


Fig-21: Overtime rate per hour in different sea food industries

During the study period women were asked how and why they needed overtime. All of them gave same reason. In regular time they were paid low wages. In all the industries overtime did not exceed 60 hours. It was often alleged that the workers in the fish processing industries were compelled to work overtime against their will. Fig-22(a) shows that among the five industries, only the workers of BSFIL worked overtime willingly due to regular payment. In DFL, the highest percentages (65%) of workers did overtime against their will (Fig-22(a)).

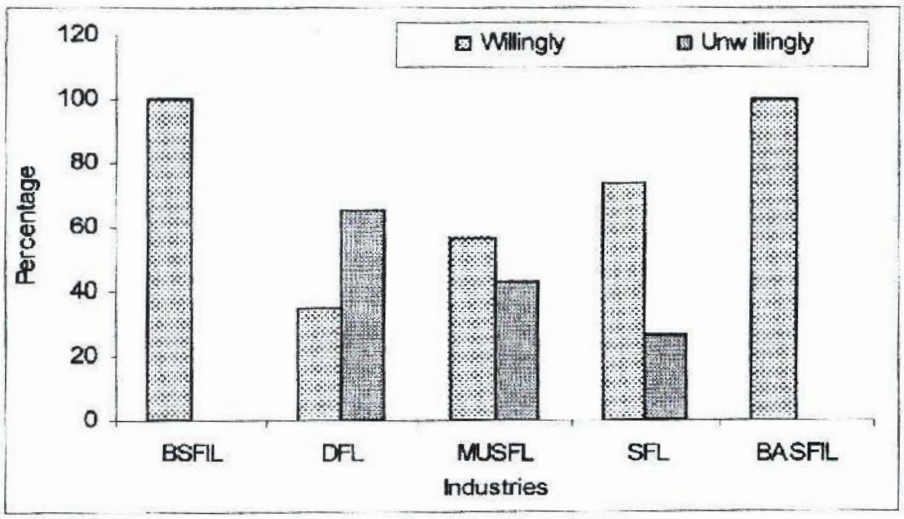


Fig-22(a): Attitude of female workers towards overtime in different sea food industries

Fig-22(b) shows out of 300 female workers, 73% worked overtime willingly while the rest of the female workers worked overtime unwillingly.

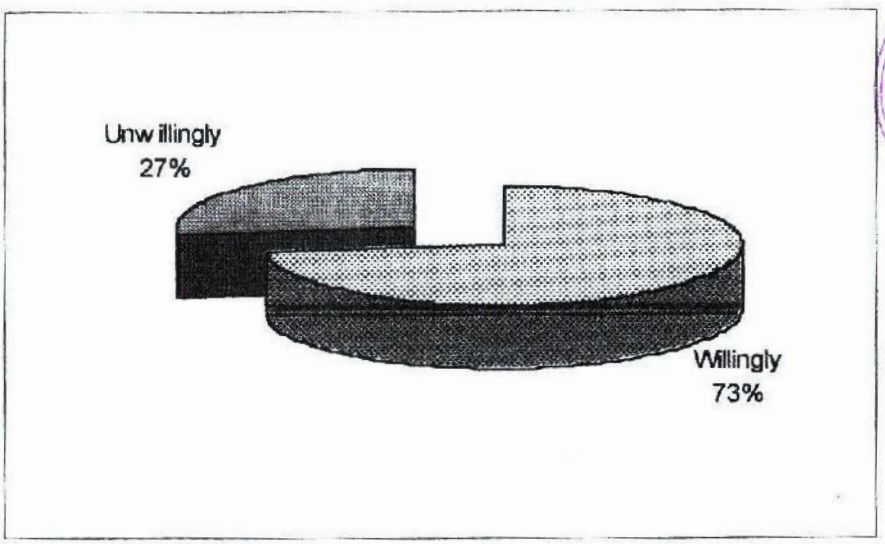


Fig-22(b): Attitude of female workers towards overtime

4.2.10 Regularity of pay and overtime

There is a well-established monitoring system in fish processing industries to keep an account of work hours. During study period, it was observed that all the factories used time cards or time sheets. The entire contractor's employee reported that the exact number of hours they worked was not counted. It was observed that the most irregularity in payment was with regard to the payment of overtime earnings. Among the industries surveyed, only two industries (BSFIL and SFL) paid regularly to the permanent workers (Fig-23(a)) while similar pattern were found in all the industries for payment of contractor's employee.

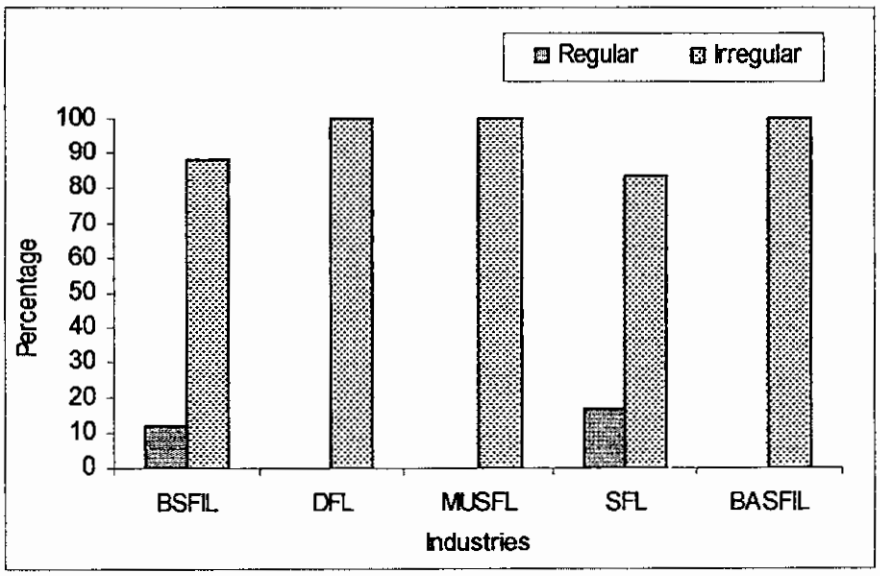


Fig-23(a): Regularity of pay to female workers in different sea food industries

It was observed that all the workers did not receive their full payment at the time of their leaving jobs. 94% of the female workers reported that they did not get payment regularly while only 6% got payment regularly as shown in Fig-23 (b).

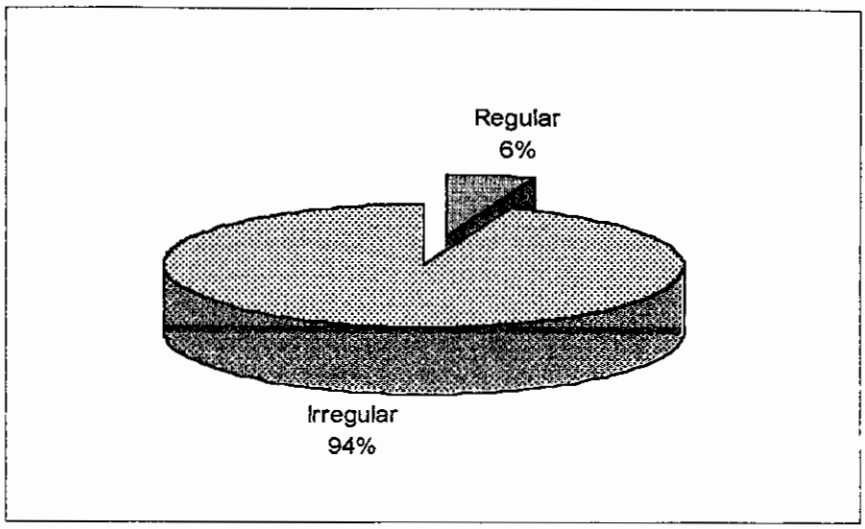


Fig-23(b): Regularity of pay to female workers

4.2.11 Monetary benefits and deduction

Permanent workers at most factories received a number of benefits beyond their monthly salary and overtime. In the industries the following benefit and penalty measures have been introduced:

I. **Attendance bonus:** only BSFIL gave Tk. 50.00 for better attendance.
II. **Production bonus:** usually this was paid to the supervisor for completion of work in time. This phenomenon is similar in all the industries.
III. **Eid bonus:** usually ½ of monthly pay.
IV. **Picnic:** without contribution of the workers every industry arranged picnic.
V. **Yearly increment:** in all the industries surveyed a little (Tk. 100.00-200.00) increment was given to the permanent workers.
VI. **Late fine:** the factory gates of all the industries were closed 15 minutes after the starting time. All the factories had introduced such penalties as, 3 days late = 1 day absent and 2 days late = some hours of overtime deducted.

For one day absent without notice, the management deducted another one day without salary. If Eid holidays were given 3 days and a worker overstays one day, then four days were marked as absent.

4.2.12 On job training

Most of the female workers received on-job training in all the five industry. Fig-24(a) shows that the highest percentages (63.33%) of workers received training in BSFIL while lowest in BASFIL. It has also be found that the highest percentage (28.33%) of women without training were found in BASFIL while lowest (10%) in BSFIL.

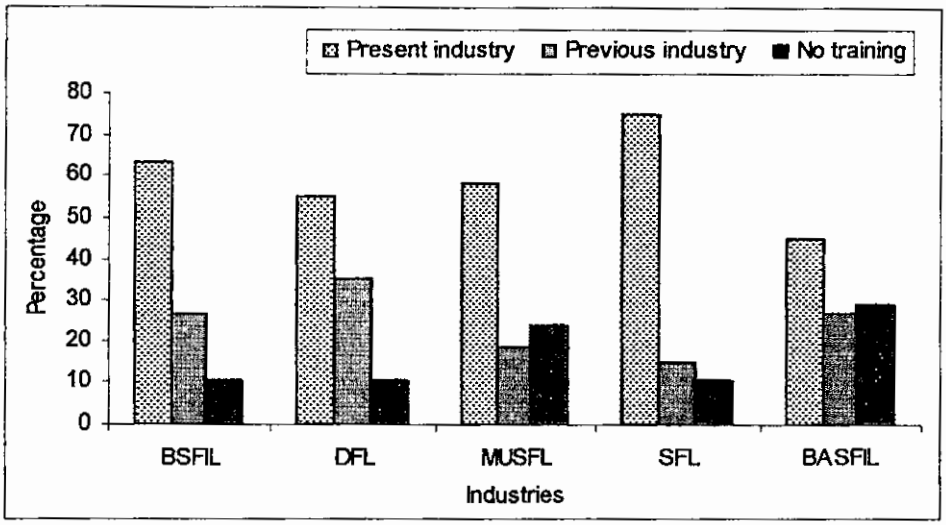


Fig-24(a): On job training of female workers in different sea food industries

From this study it is clear that 60% workers received training in the present industry while 24% workers had training from previous industry and 16% had no training as shown in Fig-24(b). In sea food industry training of the workers is essential because the female workers learn more hygiene and quality after joining the industry. As a result of a product indicated very good quality.

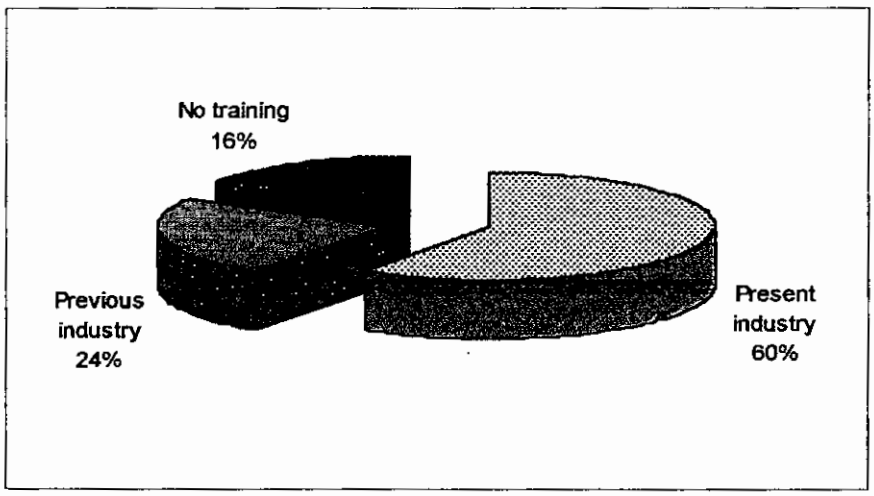


Fig-24(b): On job training of female workers

4.2.13 Job mobility

Job mobility may take place interfirm or intrafirm. Interfirm mobility occurred usually when there was no upward mobility in the same factory or no opportunity to increase their salary. Fig-25(a) shows that in all the industries the rate of interfirm mobility was much higher than intrafirm mobility and it was highest in DFL and lowest in MUSFL.

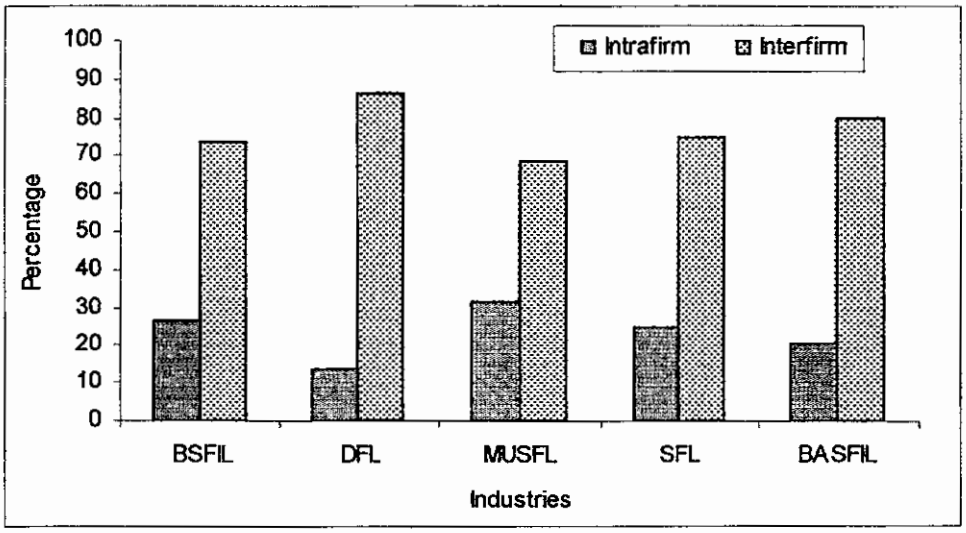


Fig-25(a): Job mobility of female workers in different sea food industries

It was informed that promotion prospects were rather slim for workers in the fish processing industry. Job at the fish processing industry was usually considered as a dead-end job. From the Fig-25(b) it was found that 77% women changed their industry.

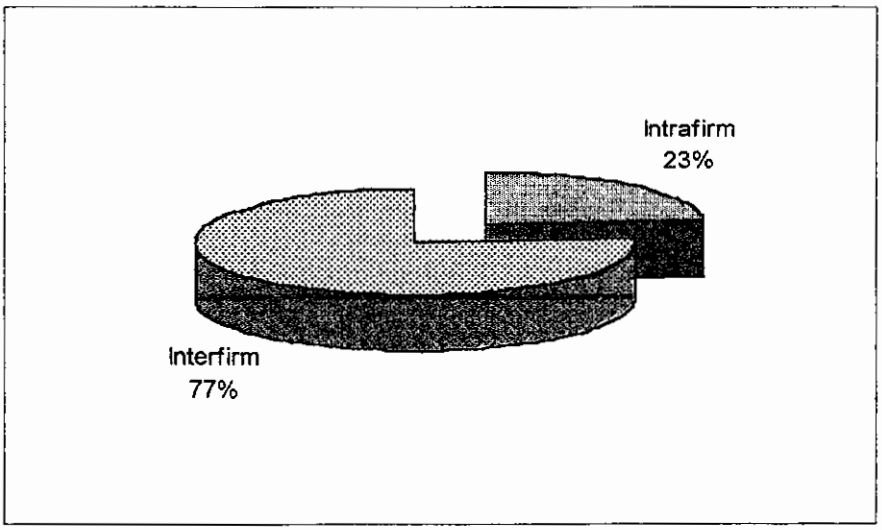


Fig-25(b): Job mobility of female workers

4.2.14 Job satisfaction

A global index of congenial work environment is the extent of job satisfaction. During the survey the workers were asked whether they were satisfied or unsatisfied with their present jobs. They reported that they were paid low wages and that were irregular payment and these rate were higher (88.33%) in DFL while lowest (68.33%) in SFL (Fig-26(a)).

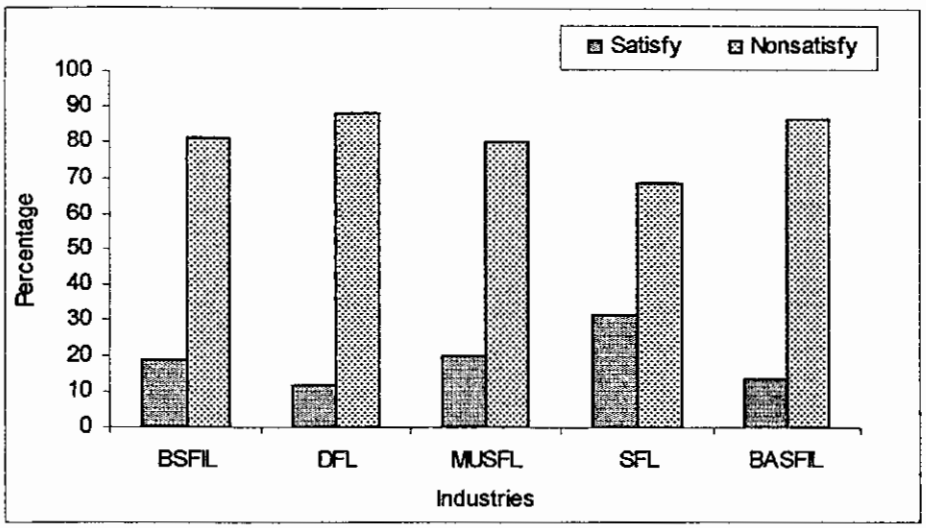


Fig-26(a): Job satisfaction of female workers in different sea food industries

Satisfaction is very relative issue. Most of the female workers in Bangladesh did not know about their rights. Female workers were observed to be satisfied if they get enough money to lead their life. Fig-26(b) viewed that above 80% of women workers were unsatisfied.

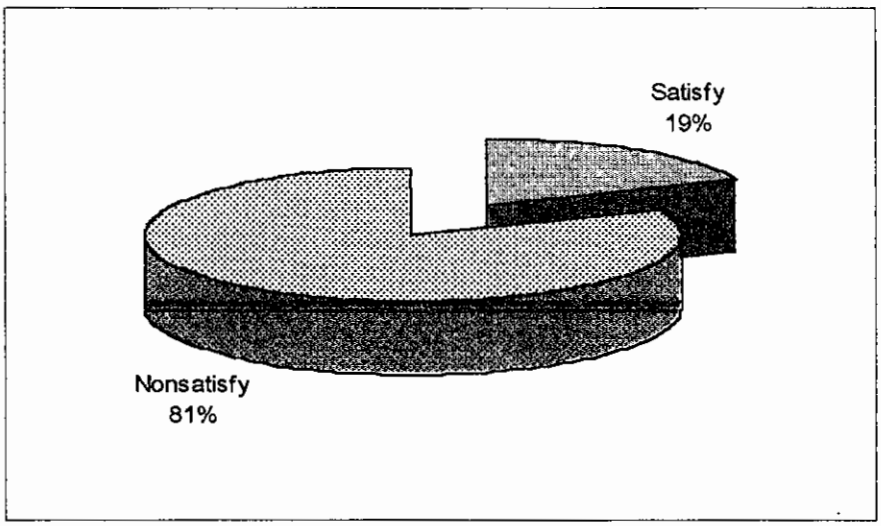


Fig-26(b): Job satisfaction of female workers

Near about 100% females claimed that the management and co-male worker of the seafood industry behaved very roughly with them. They also claimed that the supervisor, contractor and shift in charge often mentally and physically tortured them. The females were afraid to give information of sexual harassment.

4.2.15 Social status of female workers

4.2.15.1 Status in the family decision making

It is quite common in Bangladesh to find that the husband or father usually decides how the income will be spent. The results of the study showed that a little amount of respondents spent their income on their own and they have played a key role in decision-making (Fig-27(b)). Among the surveyed industry the high (10%) rate of decision-making were found in BSFIL while low (3.33%) in MUSFL as shown in Fig-27(a).

4.2.15.2 Status as primary earner

It is evident that the jobs in fish processing industry were contributing to enhance family income. The primary earner is defined as the member whose earning is the highest in the family. In all the industry, above 50% workers are the primary earners of their family (Fig-27(b)). The results revealed that among the five industries the rate of primary earner were found high in MUSFL (70%) while low in BASFIL (50%) as shown in Fig-27(a).

Fig-27(b) shows that near about 30% workers contributed their income to the family. Among the industry surveyed it was found in Fig-27(a) that the rate of workers contribution were high found in BASFIL (43.33%) while low in MUSFL(24.67%). All respondents in this category reported that their parents or family decision maker sent them to enhance family income.

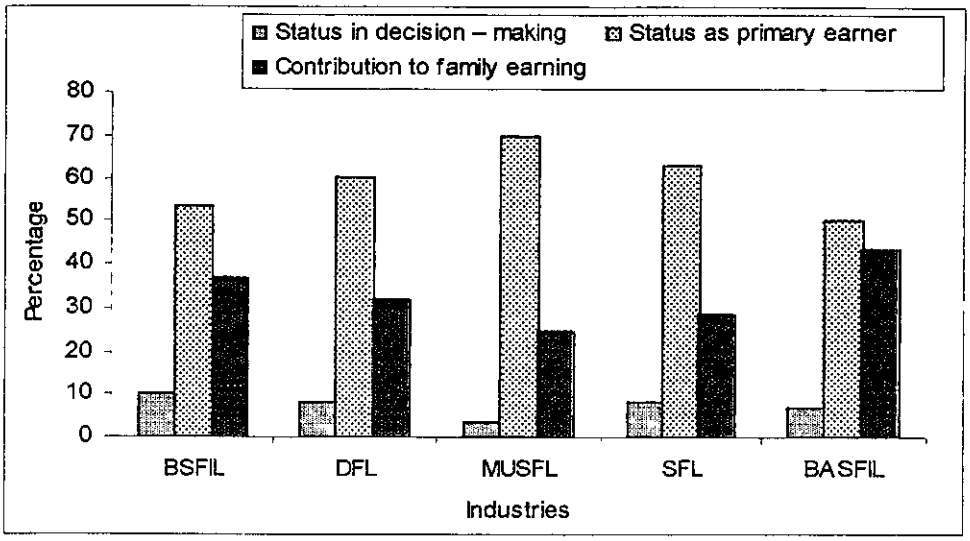


Fig-27(a): Social status of female workers of different sea food industries

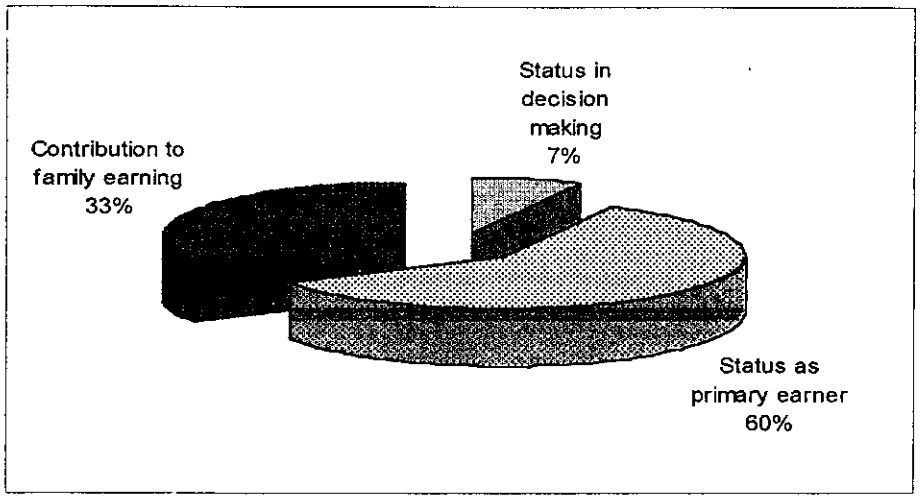


Fig-27(b): Social status of female workers

4.2.15.3 Status in the society

All the respondents replied in similar manner. It is all most same pattern in the entire respondent. They all reported that due to entrancing in the industry, they were treated as "muchua" though their economic healthiness increased. The unmarried women faced a lot of problem. One of the respondent said during the interview that she was going to leave her job in fish processing industry as the society thought that young girls underwent moral degradation by working in the industry. Her boyfriend was getting married to another woman. It is true that still now many young women faced great social difficulties when they returned to their villages. The poor working women have to undergo various types of

harassment and social obstacles. Employed in similar works women have less wages than men. Lack of education, proper training and professional expertise forces them to choose a work with less pay (Ahmed, 1992).

4.2.16 Legal rights of the female workers

4.2.16.1 Awareness about labour laws and leave facilities

Annual leave:

The Shop and Establishment Act. 1965, and the Factory's Act, 1965, provided an annual leave facility to the workers who have been employed for 12 months. The shop and Establishment Act provides for one day of leave for each 18 days employed; and in the Factory's Act, it is one day for each 22 days employed. All the permanent workers of the industry surveyed were aware of this facility.

Casual leave:

The above mentioned Acts also provided for 10 days of casual leave annually. All the permanent workers of the industry surveyed knew of this facility.

Sick and medical leave:

There is a provision for 14 days of sick/medical leave in Article 80 of the Factory Act, 1965, and in Article 16 of the Shop and Establishment Act, 1965. None of the workers were aware of this provision.

Festival leave:

Both Article 79 of the Factory's Act, 1965 and Article 14 of the Shop and Establishment Act, 1965, provide 10 days of festival leave. The workers were not aware of this leave facility.

Maternity leave:

The Maternity Benefit Act, 1939, provides for the maternity leave facility. An employee must have been employed by the employer from whom she claims maternity benefit for a period not less than nine months immediately preceding the day of delivery. A woman is entitled to benefit for six weeks preceding and including the day of delivery and for the six weeks immediately following that day. All the permanent workers of the industry surveyed were aware of this facility but without pay.

6.	Women are allowed to work between 7 a.m. to 8 p.m.	a) Not feasible for fish processing industry. b) This provision is discriminatory.
7.	There is a provision for weekly holiday and no workers are to work more than ten days consecutively without a holiday.	This provision only should be applicable for permanent workers.
8.	An employee must have been employed by the employer from whom she claims maternity benefit for a period not less than nine months immediately preceding the day of delivery.	a) Should work for at least 12 months to claim maternity leave and then should not get pregnant in five years. b) This provision only should be applicable for permanent workers.
9.	A woman is entitled to benefit for 6 weeks preceding and including the day of her delivery, and 6 weeks immediately following that day.	a) It should be two weeks prior and 4 weeks after the day of her delivery. b) Should be without pay.
10.	Employees are entitled to enjoy the following leave every year: 10-20 days causal leave 14 days annual leave sick and medical leave	Should be provided to those confirmed, i.e. after one year of service.

4.2.17 Status of child labour

Recently, the employment of child labour in the seafood industry has become an important issue. In the present investigation, even workers of the age of 10 were found. In all the seafood industry surveyed, above 28% female were child labour (Table-26). The result revealed that the highest percentages of child labour were to be found in BASFIL (41.67%) while lowest in BSFIL (28.33%).

It has been found that most of the child labours (above 75%) came from the rural area (Table-26). The child labours of DFL were 100% rural based and 92% worked in BASFIL. It may attribute that both the industry were situated in rural area.

Table-26 also revealed that most of child labour (above 70%) lived with their family while some of the young girl lived with their relatives and a few lived in factory mess.

The results also viewed that above 85% of child labour were unmarried in all the five industry. Traditionally the rural girls had usually been married off by 14 years. The fact that girls of age 10 and below 18 years came from rural areas to cities for job. Instead of getting their daughters married, parents were sending daughters to earn their own livelihood. These unmarried girls were dependent either on their father or brother. Thus, there is one mouth less to feed and also the family could get remittance from these workers.

The results also revealed that above 40% child workers were students before joining in the seafood industry, a few of them were engaged as maid servant or worked in their family while a remarkable portion were labourer. The parents of these children were usually those who could not afford to send them school.

Most of the young girls claimed that they faced a lot of objections after joining in the seafood industry. These included remarks as working in the seafood industry were bad and it spoiled girls.

CHAPTER FIVE:

CONCLUSION AND RECOMMENDATIONS

5.0 CONCLUSION AND RECOMMENDATIONS

The management and the operation methods in the five seafood industries investigated were fully maintained by the Board of Directors who were also owners of the industries. These seafood industries have adopted HACCP (Hazard Analysis Critical Control Point) system as per the requirement of European Commission and other importing countries in order to compete in the international market. The overall hygienic condition, quality maintenance of products, processing systems, packaging and frozen storage in all the five industries investigated were good. The processing and packaging system of frozen products were dependable on the buyers demand. About 80% of the total workforces were women. The role of the female workers in seafood industries had substantial influences in the quality of the frozen product. Hence, the socio-economic condition of these workers should not be ignored. The female workers suffered from many problems. In many cases, they could not understand their responsibilities. They were not always conscious about their duties. Because of their ignorance, they were deprived from their rights. An effective and integrated approach is immediately required for the protection of their rights in the industry. A set of recommendations has been proposed to improve the socio-economic condition and service facilities related to facts and findings from the present study as follows:

- The authority should recruit females who have minimum educational qualifications because they play vital role in the industry. In the case of prevalent workers, the illiterate workers can resort on various education programs offered by concern GO and Non Government Organizations. Now a days such organizations provide various type of formal and non formal education programs like adult education, elementary education etc.

- Weekly / monthly salary of the female workers should be increased. It should be for both of the permanent and temporary workers. The salary should be in conjunction with the profit of the industry.

- Daily working hours should be reduced in the case of temporary workers. For production purpose, overtime facilities could be increased both for the permanent and temporary workers during the season.

- Working hours and holidays should be in accordance with the international recommendation. International acceptable working hours and at least one day holiday should be given and overtime facilities should be increased.

- Job satisfactions of female workers were very low and for this job mobility were high among the temporary workers. Job mobility could be reduced by increasing the number of permanent workers to make the industry productive throughout the year.

- Individual workers should be trained on their specific work along with common training on sanitation. Since all the workers know that their activities influence the quality of the product so, special training on quality control should be required by the authority i.e. HACCP.

- Extra facilities such as bonus, medical etc. should be provided for both permanent and temporary workers. Childcare facilities should also be given to the female workers.

- The female workers were treated as lower status in comparison to co-male workers. Thus, status of the female workers should be regarded equal to that of the male workers.

- Recruitment of the female workers should be done through newspaper circulation instead of contractors. These female workers would then be free form the harassment of the contractors.

- Leisure time should be increased to 1 hour instead of 30 minutes. For recreational purposes the authority could provide a common room having TV, indoor game

facilities. For relaxing purposes of the female workers during leisure period, the authority could also provide common room facilities.

- The female workers were treated badly by contractors and co-male workers. So, all types of harassment of the female workers in seafood industries should be observed and immediate action should be taken.

- The government could set appropriate rules and regulations for implementing in seafood industries. Realization and concomitant action by the government should immediately be made to deal with the acute problems of female workers in seafood industries in Bangladesh.

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ANNEX

ANNEX

Table-9: Age distribution of female workers

Age group	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
10-14	10	16.67	9	15.00	11	18.33	10	16.67	11	18.33	51	17.00
15-19	11	18.33	12	20.00	9	15.00	11	18.33	13	21.67	56	18.67
20-24	7	11.67	8	13.33	10	16.67	7	11.67	5	8.33	37	12.33
25-29	15	25.00	17	28.33	16	26.67	15	25.00	14	23.34	77	25.67
30-34	6	10.00	7	11.67	5	8.33	6	10.00	6	10.00	30	10.00
35-39	6	10.00	5	8.34	6	10.00	7	11.67	5	8.33	29	9.66
40-60	5	8.33	2	3.33	3	5.00	4	6.66	6	10.00	20	6.67
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-10: Religious status of female workers

Religion	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Muslim	57	95.00	54	90.00	45	75.00	54	90.00	55	91.66	265	88.33
Hindu	3	5.00	5	8.33	15	25.00	6	10.00	4	6.67	33	11.00
Others	-	-	1	1.67	-	-	-	-	1	1.67	02	0.67
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-11: Marital status of female worker

Marital status	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Unmarried	7	11.67	6	10.00	7	11.67	5	8.34	7	11.67	32	10.67
Married	17	28.33	16	26.67	14	23.33	19	31.67	17	28.33	83	27.67
Oppressed	24	40.00	25	41.66	25	41.66	25	41.66	23	38.33	122	40.66
Divorced	8	13.33	7	11.67	9	15.00	8	13.33	9	15.00	41	13.67
Widow	4	6.67	6	10.00	5	8.34	3	5.00	4	6.67	22	7.33
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-12: Education level of female workers

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Illiterate	34	56.67	31	51.67	39	65.00	35	58.33	33	55.00	172	57.33
Can sign at best	14	23.33	12	20.00	12	20.00	16	26.67	16	26.67	70	23.33
Up to class V	7	11.67	14	23.33	6	10.00	3	5.00	8	13.33	38	12.67
Class VI to X	4	6.67	2	3.33	3	5.00	4	6.67	2	3.33	15	5.00
Above class X	1	1.67	1	1.67	-	-	2	3.33	1	1.67	05	1.67
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-13: Family types of female workers

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Single	47	78.33	41	68.33	38	63.33	46	76.67	31	51.67	203	67.67
Joint	13	21.67	19	31.67	22	36.67	14	23.33	29	48.33	97	32.33
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-14: Family size of female workers

Family member	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
1-2	15	25.00	13	21.67	09	15.00	16	26.67	11	18.33	64	21.33
3-4	19	31.67	21	35.00	24	40.00	20	33.33	23	38.33	107	35.67
5-6	15	25.00	17	28.33	16	26.67	14	23.33	15	25.00	77	25.67
7-8	08	13.33	04	6.67	08	13.33	06	10.00	08	13.33	34	11.33
>8	03	5.00	05	8.33	03	5.00	04	6.67	03	5.00	18	6.00
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-15: Origin of female workers

Origin	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Rural	47	78.33	60	100	49	81.67	52	86.67	56	93.33	264	88
Urban	13	21.67	-		11	17.33	08	13.33	04	6.67	36	12
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-16: Mode of recruitment of female workers

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Permanent	07	11.67	06	10.00	07	11.67	10	16.67	08	13.33	38	12.67
Causal	13	21.67	14	23.33	13	21.67	10	16.67	12	20.00	62	20.67
Contractors recruited	40	66.67	40	66.67	40	66.67	40	66.67	40	66.67	200	66.66
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-19: Overtime rate per hour (Tk./hour)

Characteristics	BSFIL (Tk./hour)	DFL (Tk./hour)	MUSFL (Tk./hour)	SFL (Tk./hour)	BASFIL (Tk./hour)
Day	6.00	5.00	5.00	8.00	5.00
Night	10.00	8.00	8.00	12.00	8.00

Table-20: Workers attitude towards overtime

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Willingly	60	100	21	35	34	56.67	44	73.33	60	100	219	73
Unwillingly	-	-	39*	65	26*	43.33	16	26.67	-	-	81	27
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

* Irregular payment

Table-21: Regularity of pay and overtime

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Regular	07	11.67	-	-	-	-	10	16.67	-	-	17	5.67
Irregular	53	88.33	60	100	60	100	50	83.33	60	100	283	94.33
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-22: On job training of female workers

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Present industry	38	63.33	33	55	35	58.33	45	75	27	45.00	178	59.33
Previous industry	16	26.67	21	35	11	18.33	09	15	16	26.67	73	24.33
No training	06	10.00	06	10	14	23.33	06	10	17	28.33	49	16.34
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-23: Job mobility of female workers

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Intrafirm	16	26.67	08	13.33	19	31.67	15	25	12	20	70	23.33
Interfirm	44	73.33	52	86.67	41	68.33	45	75	48	80	230	76.67
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-24: Level of job satisfaction

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Yes	11	18.33	07	11.67	12	20	19	31.67	08	13.33	57	19
No	49	81.67	53	88.33	48	80	41	68.33	52	86.67	243	81
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

Table-25: Status of female workers

Types	BSFIL		DFL		MUSFL		SFL		BASFIL		TOTAL	
	Female	%	Female	%	Female	%	Female	%	Female	%	Female	%
Status in decision-making	06	10.00	05	8.33	02	3.33	05	8.33	04	6.67	22	7.33
Status as primary earner	32	53.33	36	60.00	42	70.00	38	63.33	30	50.00	178	59.34
Contribution to family earning	22	36.67	19	31.67	16	24.67	17	28.33	26	43.33	100	33.33
Total	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**60**	**100**	**300**	**100**

APPENDIX

Appendix-1: Questionnaire for the authority

Date of interview: ☐

Name of the Respondent: ☐

Post of the respondent: ☐

1. Name of the industry: .....

a. Location:

b. Year of establishment: ☐

c. First year of production: ☐

d. Financial support: ☐ Bank

2. Layout Plan of the Industry: .....

3. Organogram of the Industry: .....

4. Manpower

a. Types of workers:

☐ Male ☐ Female

b. Number of workers involved in the industry:

☐ Male ☐ Female

c. Are they permanent or temporary?

☐ Permanent ☐ Temporary

d. No of permanent worker:

☐ Male ☐ Female

e. No of temporary worker:

Male	Female

f. Amount of salary/month of a permanent worker:

Male	Female

g. Amount of salary/month of a temporary worker:

Male	Female

5. Important accessories

a. Kinds of ice plants:

Block	Flake

b. Capacity of ice plant: ton/day

c. Number of ice crusher:

d. Types of fire control equipment:

Gas	Sand	CFC extinguisher	Others

6. Machinery room

a. Number of compressor:

b. Number of generator:

c. Compressor purchased from:

India	Japan	England	Holland	Others

d. Generator purchased from:

Japan	Sweden	China	UK	Singapore	USA	Germany
☐	☐	☐	☐	☐	☐	☐

7. Chill room:

a. Number of chill room: ☐

b. Capacity of chill room: ☐ ton

8. Chlorination:

Concentration ☐ ppm in processing section

9. Raw materials:

a. What kinds of raw materials are received?

Fish	Shrimp	Prawn	Frog-legs	Others
☐	☐	☐	☐	☐

b. Shrimp/Prawns/Others species:

P. monodon	*P. indicus*	*Metapenaeus monoceros*	*Macrobrachium rosenbergii*
☐	☐	☐	☐

c. Species of white fish:

Tenualosa	*Catla*	*Labeo*	Others
☐	☐	☐	☐

d. Sources of raw materials:

Own farm	Agent
☐	☐

e. How do they reach?

River way	By road	Both
☐	☐	☐

f. Condition of raw materials:

Head on	Headless
☐	☐

10. Freezing:

a. Sources of raw materials: ☐

b. Types of freezers:

☐ IQF ☐ Air blast ☐ Contact plate freezer

11. Packing:

a. Process of carton binding:

☐ Manually ☐ Semi-auto ☐ Auto ☐ Both

12. Cold storage:

a. Number of cold storage:

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

b. Capacity of cold storage:

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ Master Cartons

13. Brand name:

Appendix-2: Questionnaire for the contractor

1. Date of interview: | | | |

2. Place of interview (please tick):

   a) Office b) residence c) Other place

3. Name of the respondent: .....

4. Age: ..... Years

5. Educational status of the respondent (please tick):

   a) Illiterate b) Can sign at best c) Above class V d) Class VI - X

   e) SSC f) HSC g) Above HSC

6. Name of the industry: .....

7. Year of involvement: .....

8. Have any previous experience (please tick):

   a) Yes b) No

9. Collection area of the female workers (please tick)

   a) Rural b) Urban

10. Selection criteria of females: .....

11. Is the worker engaged in this work willingly?

    a) Yes b) No

12. Mode of payment to the workers:

    a) Daily b) Weekly c) Monthly

13. Any problems from the female workers:

    a) Yes b) No

14. If yes, what type? .....

Appendix-3: Questionnaire for the female workers

1. Date of interview
2. Place of interview
3. Name of the Respondent
4. Address of the Respondent
   - C/o
   - Vill.
   - P.O
   - Dist.
5. Respondent's Age
6. Respondent's Religion
   - Muslim
   - Hindu
   - Others
7. Marital Status
   - Married
   - Unmarried
   - Divorced
   - Widow
   - Oppressed

8. Respondent's Educational Qualification

Can sign ☐ Illiterate ☐

Up to class V ☐

Class VI to X ☐

Above class X ☐

9. Family Type

Single ☐ Joint ☐

10. Family Size ☐

11. Origin of female workers

Urban ☐ Rural ☐

12. Mode of recruitment

Permanent ☐ Casual ☐ Contractor recruited ☐

Others ☐

13. Daily working time ☐

14. Interval between work

Yes ☐

Not ☐

Any comment ☐

15. Weekly holiday

Yes ☐

Not ☐

Any comment ☐

16. Monthly earning ☐

17. Any over time

Yes ☐

Not ☐

18. Overtime rate

Hour / Day ☐ Hour / Night ☐

Any comment ☐

19. Female's attitude toward overtime

Willingly ☐ Unwillingly ☐

20. Regularity in payment

Regular ☐ Irregular ☐

21. Any extra benefits

Attendance bonus ☐ Production bonus ☐

Festival bonus ☐ Yearly increment ☐

Any comment ☐

22. Penalty

Late fine

Others

23. Any training

Yes

Where

Present industry

Previous industry

No

Any comment

24. Job mobility

Yes

Not

Why

25. Job satisfaction

Yes

Not

Any comment