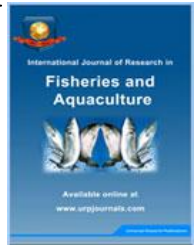




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Original Article

The present status of sea food pre-processing facilities in Kerala with reference to Alleppey district

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Abstract

Export of processed seafood products has shown a continuous upward growth over the last few decades. As a result, many seafood-processing plants have emerged in the recent past which has in turn triggered the surfacing of many independent sea food pre-processing units. Both the pre-processing and processing sectors have evolved hand in hand and have provided employment to many, majority being women. A survey was undertaken to understand the socio-economic status and challenges faced by owners and women workers of shrimp pre-processing units located in Alleppey district of Kerala and to assess the presently available facilities at these units. The survey indicated that most of the sampled shrimp pre-processing centres lack many amenities required for maintaining the requisite hygiene standards at these units. The majorities of the women employed were educated and in the age range 35-50 years. Though the large majority of women had an experience of more than 5 years, they remain underpaid and are treated as unskilled workers. Many of the pre-processing centre owners are finding it difficult to develop infrastructure required for maintaining high hygiene standards owing to their indebtedness and low profit margin. The study showed that most of the pre-processing units are in the declining stage and if proper steps are not taken for recurrence many will be jobless.

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Key words: Shrimp Pre-processing Units; Women in pre-processing plants; Hygiene Standards; Fishery extension; Socio-economic condition.

1. Introduction

Fish and fish based products have a reputation of being the most internationally traded commodity [1]. The fisheries sector is a powerful income and employment generator for maritime nations. In India, seafood export is evolving fast because of the growing demand for Indian seafood products across the world. Export of marine products from India has reached an all time high of 928215 tonnes valued at Rs. 18856.26 crores (USD 3511.67 million) and Frozen Shrimp continued to be the major export value item accounting a share of 51.35% of the total earnings [2]. The tremendous growth in the resources and infrastructure of seafood industry across the country is also being observed in Kerala. The development of fish and fishery products export from Kerala has gone hand in hand with the evolution of the fish processing sector. A distinct feature of the processing sector in Kerala is its dependence on the pre-processing sector which is popularly known as "peeling sheds". The seafood products exported from Kerala is

dominated by frozen shrimp, cuttle fish and squid. Pre-processing is an extremely labour intensive operation, the success of which depends on the availability of experienced labour and raw material. Availability of raw materials varies with season.

In India, 90% of workers employed in agriculture and allied sector are women [3]. The pre-processing sector is no different as women form the dominant workforce engaged in tasks such as sorting, grading, peeling, cutting, slicing and washing. More than 90% of the workforce in prawn pre-processing centres and 70% in processing of other fishery products are constituted by women [4]. Even then the well being of fisherwomen measured on the basis of capabilities like morbidity, longevity, nutrition and education has been found to be low [5]. The socio-economic condition of fishing community largely depends on the availability of fishery resources and the women play a very important role in supporting the family [6]. Women engaged in pre-processing centres mainly belong to

economically backward classes. They are employed on contract/casual basis and hence are deprived of many of the social security benefits. The women workers lack awareness and knowledge on occupational health hazards and safety. Further they are exposed to cold environment, chlorinated water and fish protein related bio-agents in the peeling shed. The improper handling of tools and awkward working postures while attending to work contribute to muscular pain and discomfort in various parts of body.

The role played by the pre-processing sector is exceedingly important in fishery products export. It absorbs much of the risks associated with fluctuations in raw material prices and also bears the fixed and variable costs associated with pre-processing, thereby, insulating the processing centres from such issues. Much attention has to be given to food safety standards and quality parameters in peeling sheds to meet the level of hygienic requirements set forth by International Markets/buying countries. Even though the sea food processing sector has come a long way in maintaining food safety standards for sea food exports to major consumers, many challenges still persist.

An appraisal on the challenges faced by shrimp pre-processing centres in Kerala and specific data on participation of women workers in the pre-processing centres will enable proper planning and optimal utilisation of pre-processing units and its human potential for improving the seafood export from the country. With this intention a study on pre-processing centres was conducted at Alappuzha (Alleppey) district, Kerala where as many as 119 pre-processing units (peeling sheds) are located. The study was conducted with the following specific objectives 1) To investigate the presently available facilities at pre-processing centres, 2) To analyse the socio-economic condition of the women workers employed in the sector and 3) To investigate the socio-economic condition of owners of fish pre-processing centres.

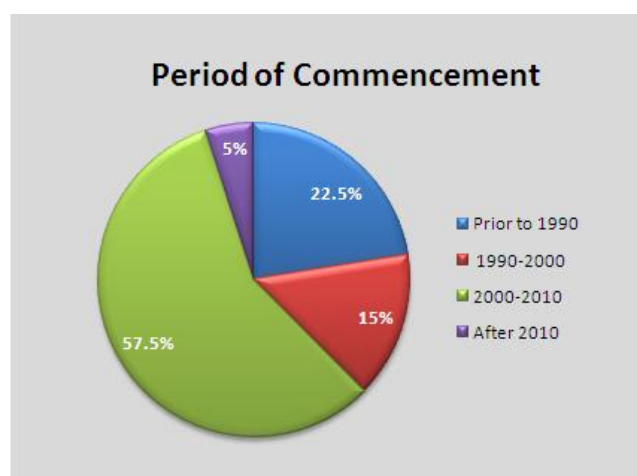
2. Methodology

The study was mainly carried out in the shrimp pre-processing units located at Aroor and Ambalappuzha regions in Alappuzha (Alleppey) district, Kerala. These regions lodge a total of 119 pre-processing units which provide employment to about 6900 workers (women) in various aspects of pre-processing, viz., sorting, grading, peeling, cutting, slicing and washing. Each of these 119 pre-processing centres is owned and operated by a single proprietor. From among 6900 workers employed in the pre-processing units, 701 women (approximately 10% of the strength) were selected at random for personal interview. Similarly 40 of the peeling shed owners from the two zones were identified at random for personal interview. The required information was obtained from the respondents using well structured questionnaires prepared independently for workers and owners.

3. Results and Discussion

The pre-processing units in both Aroor and Ambalappuzha zones exhibit very little or no marked differences with regard to physical facilities, operational systems and hygiene standards. The majority of the pre-processing facility owners (75%) claim that their units have the required permission from the local self governments and

the Pollution Control Board, while the remaining 25% of the units exist without registration (Table 1). Only 10% of the units have Marine Product Export Development Authority (MPEDA) registration. The regular inspection by MPEDA for ensuring strict hygienic control in the units following registration is the main reason for hesitation of owners to apply for MPEDA registration. Improvements in standards demand high investment resulting in high cost of production. Majority of pre-processing facilities operate under reduced capacity and have low profit margins to sustain investments required to meet higher hygienic standards. All of the pre-processing facilities (sampled for study) in the two zones have been functioning for a period ranging from 2 to 23 years. The majority of them (57.5%) have been established during a period from 2000 to 2010. There are 9 units which were launched prior to 1990. Details pertaining to the time of establishment of pre-processing units are presented in Fig.1. The age of pre-processing units is important in the context of hygiene maintenance as the older peeling sheds need renovation to create congenial environment for pre-processing work and to ensure quality standards which would require an increased investment.



3.1. Physical Facilities at Pre-processing Units

Availability of basic facilities at 40 peeling sheds was studied and the data is presented in Table.2. Out of the 40 peeling units considered for the study, 15 are temporary constructions requiring immediate renovation. Twenty seven peeling sheds have concrete floors and 11 have tiled floors while the remaining ones have traditional floors where hygiene control becomes a difficult task. The floors of almost all the peeling sheds look apparently clean. Lighting was observed to be adequate in 80% of the sheds. Lack of proper ventilation was observed in 57.5% of the peeling sheds resulting in persistence of a foul odour in most of the sheds (35%). Deficient ventilation in pre-processed centres is a major concern as it can have an adverse effect on the quality of materials being processed. Stainless steel tables, a prerequisite for pre-processing of sea food was found to be available only in 22.5% of the units. The remaining 77.5% of the units was devoid of such an essential facility. During the survey it was revealed that some of the peeling shed workers in Ambalappuzha zone do carrying out peeling at home with the permission of

Table. 1. Fish pre-processing facility: Registration of units with licensing entities

No	Authority	Frequency	Percentage
1	No license	6	15.0
2	MPEDA	3	7.5
3	MPEDA, Panchayat and EIA	1	2.5
4	MPEDA and Panchayat	5	12.5
5	MPEDA, Panchayat and PCB	1	2.5
6	PCB	1	2.5
7	Panchayat	23	57.5
	Total	40	100

*MPEDA- Marine Products Export Development Agency, EIA- Export Inspection Agency and PCB – Pollution Control Board

Table.2. An Account of Basic Amenities at Pre-processing units.

S. No.	Basic Amenities	Frequency	Percentage
1	Uniforms for workers	7	17.5
2	Gloves for use while peeling	2	05.0
3	Masks	3	07.5
4	Hand & foot dip	7	17.5
5	Fly proof netting	10	25.0
6	Chilled room	9	22.5
7	Stainless steel table for peeling	9	22.5
8	Trolleys	10	25.0
9	Rest room	22	55.0
10	Bath	31	77.5
11	First aid facility	24	60.0
	Flooring		
12	Tiled	11	27.5
	Concrete	27	67.5
	Ordinary	02	05.0
	Water Facility		
13	Running water from pipes (Hygienic)	28	70.0
	Bore well water (Hygienic)	9	22.5
	Transporting water from well (Unhygienic)	3	07.5
	Cleanliness		
14	Excellent	14	35.0
	Satisfactory	24	60.0
	Poor	02	05.0
	Waste Disposal		
15	Burying in the soil	02	05.0
	Composting	30	75.0
	Depositing in the nearby water source	08	20.0

their owners. The practice of “home peeling” needs to be discouraged as it invites serious concerns over hygiene control. The facility of running water (pipe water) was found to be available in 70% of the units. Bore wells have been installed in 22% of the units and the remaining ones depend on transported water from nearby wells. Most of the peeling sheds (95.5%) use clean hygienic water for pre-processing. Absence of cold/chilled rooms was found to be a major concern in 77.5% of the pre-processing facilities which pose a risk of rapid spoilage of pre-processed goods. Thirty of these sheds lack fly-proof netting which further worsens the problem. Nearly 50% of the pre-processing units do not have adequate drainage facilities. Impeded drainage creates environmental problems in 5% of the

units. Waste water is drained appropriately in 45% of the units. Impeded drainage coupled with poor fly control will have a definite role in the spoilage of shrimp. For pre-processing, 95% of the units use either plastic (85%) or steel (10%) utensils. This is a welcome improvement over the old practice of using bamboo baskets. Nevertheless, 5% the units still continue to use bamboo baskets. The accumulation of waste materials after pre-processing is a pollutant with a potential to cause health hazards. Seventy five percent of the units address this problem by converting the wastes into manure for which there is demand. However, rest of the units (20%) discard the waste materials into the nearby canals inviting criticism from the public. Trolleys are used for transporting materials in 25%

Table 3. Classification of workers in pre-processing centres based on various parameters.

S. No.	Classification Parameters	Frequency	Percentage
1	Age Group		
	18-25years	14	2.0
	25-35 years	126	18.0
	35-50 years	426	60.8
	50-60 years	82	11.7
	Above 60 years	53	7.6
2	Educational level		
	Illiterate	26	3.7
	Primary	124	17.7
	Upper primary	184	26.2
	High School	329	46.9
	Pre-degree / +2	35	5.0
	Degree	3	0.4
3	Working Experience (in Years)		
	Less than 2	107	15.3
	2-5	95	13.6
	5-10	157	22.4
	10-20	193	27.5
	More than 20	149	21.3
4	Working Days in a Month		
	Less than 15	Workers in 3 Units	7.5
	15-20	Workers in 15 Units	37.5
	20-25	Workers in 15 Units	37.5
	More than 25	Workers in 7 Units	17.5
5	Quantity of Prawns peeled in one day.		
	Less than 15	271	38.7
	15-20	146	20.8
	20-25	96	13.7
	25-35	162	23.1
	More than 35	26	3.7
6	Rate of Payment (Rupees/kg of prawns peeled)		
	10.00	383	54.6
	10.50	44	6.3
	11.00	31	4.4
	13.50	243	34.7
7	Daily Wages of Workers (in Rs)		
	Less than 100	41	5.8
	100-200	407	58.1
	200-300	185	26.4
	300-500	59	8.4
	More than 500	9	1.3

of the units. In the other units, it is done manually. Workers in the pre-processing facilities are strictly required to wear gloves, masks, gum boots and uniforms. It is surprising that these materials are not supplied to the workers by 95% of the owners. Similarly, in 82.5% of the sheds, hand and foot dips are not being insisted upon. Only 55% of the peeling facilities are providing rest rooms for workers. Lavatory/bathroom facilities are available only in 77.5% of the units. Ice is a major input used in pre-processing of shrimp. But none of the units have ice making facility. The units procure ice blocks from factories. Normally ice is made from filtered water. But sometimes the factories are constrained to use unfiltered water which may result in contamination of the pre-processed goods.

From the forgoing, it could be concluded that barring a few, the pre-processing units in Aroor and Ambalappuzha zones do not have congenial facilities for enforcing strict food safety control. The dependence on these pre-processing centres will create trouble to processing and exporting units in the long run. This is a matter of concern both for the processors (exporters) and the Government.

3.2. Socio-economic Status of Women Workers

A study on the status and classification of the workers in pre-processing centres was carried out based on a sample size of randomly selected 701 workers and the data is presented in Table 3. Women were found to be the dominant workforce in the sea food pre-processing facilities located in the two zones selected for the study.

Table.4. Annual family income and expenditure of pre-processing centre workers.

Ranges of annual income	Annual family income		Annual family expenditure		Loan availed	
	No. of families	Percentage over total	No. of families	Percentage over total	No. of families	Percentage over total
0	0	0	0	0	237	33.8
<25000	132	15.8	90	12.8	106	15.1
25000-40000	130	18.5	160	22.8	63	9.0
40000-55000	80	11.4	125	17.8	90	12.8
55000-75000	161	23.0	195	27.8	21	3.0
75000-100000	86	12.3	79	11.3	4	6.0
>100000	112	16.0	52	7.4	180	25.7
Total	701	100.0	701	100.0	701	100.00

Table. 5. Production potential of pre-processing centres.

S. No	Production potential(kg)	Frequency	Percentage over total
1	< 500	10	25.0
2	500-1000	11	27.5
3	1000-2000	11	27.5
4	2000-3000	3	7.5
5	> 3000	5	12.5

Table. 6. Capability of fish pre-processing centres to employ workers per day

No	Capability (No. of workers / day)	Frequency	Percentage over total
1	10-25	8	20
2	25-35	4	10
3	35-50	10	25
4	Above 50	18	45
	Total	40	100

Table. 7. Monthly income from pre-processing units and family income of pre-processing unit owners

Particulars (range of income-Rs.)	Income from unit per month		Family income per month	
	No. of unit owners	Percentage over total	No. of unit owners	Percentage over total
< 25000	27	67.5	26	65.0
25000-35000	6	15.0	5	12.5
35000-45000	1	2.5	3	7.5
45000-55000	6	15.0	2	5.0
>55000	0	0	4	10.0
Total	40	100.00	40	100.0
	Mean monthly income of owners : Rs.22663.00		Mean family income per month:Rs27525.00	

They, by and large, hail from the coastal tracts in the respective zones. When grouped according to age it was found that majority (60.8%) of the workers belong to the age group 35-50 years, the average being 43 year. Women belonging to the younger age group (18-25 years), are only a few in the peeling sheds (2%) which indicates that new generation of women is apathetic to sea food pre-processing work. This may be the reason for the pre processing units to retain very old workers (above 60 years). Literacy level among workers was very satisfactory as 96.3% of the workers were found to be literate and a large group of them (52.2%) have an educational level up to high school or higher. The workers generally have ample experience in pre-processing work, the average being 14

years. Nearly 21.3% of the workers have experience above 20 years. This is indicative of the fact the pre-processing shed owners are retaining the services of old people as youngsters are not available for peeling work. In spite of their long years of service in the peeling sheds, however, these workers are treated as 'casual' and 'unskilled' thereby depriving them of their social security benefits. This is a cunning way of reducing cost of production and increasing profit margin. Women find employment throughout the year (10 to 12 months) in 36.4% of the peeling sheds. In 30.4% of the sheds, pre-processing is carried out for a period of 8-10 months. The period of brisk activity (employing the maximum number of workers) is from April to August. The months of June and July,

characterised by heavy rains have the least activity. The mean number of working days in a month is 22. The quantity of shrimp peeled varies with the workers efficiency. The quantity peeled is below 15 kg per day by 38.7% of the workers. There are 162 workers who peel 25 to 35 kg of shrimp per day. There are a few workers (3.7%) who are capable of peeling above 35 kg per day. The remuneration of the workers depends on quantity of shrimp peeled. The average rate of wage per kg of shrimp peeled is Rs.11.45, but the range is Rs.10.00 to Rs.13.50. Two hundred and forty three workers (34.7%) earn Rs. 13.5 per kg. However the majority of the workers (54.6%) earn at the rate of Rs.10.00 per kg. More than half of the workers (58.1%) earn wages in the range of Rs.100 to Rs.200 per day and twenty six percentages of the workers earn in the range of Rs. 200 - Rs. 300 a day. Only 8.4% of the workers are observed to earn Rs. 300 and above per day. The wages are paid weekly in 74.2% of the cases and the rest of the units pay monthly.

The annual family income of the pre-processing centre workers ranges from less than Rs.25000 to more than Rs.100000. About 84% of families of workers have an income of less than Rs. 100000 per annum (Table. 4). The annual expenditure of these families is almost at par with their annual income if not more. It is, therefore, obvious that they have no savings and that many of them are in debt. Majority of the respondents (66.2%) have availed loan from various sources. The indebtedness of 25.7% of the loaners is above one lakh rupees. Nearly 50% the workers belong to families below the poverty line. The majority of workers (68.8%) are satisfied with the prevailing rates of wages and the mode of payment. However 31.2% of the workers expressed dissatisfaction over the wage rate. For 93.2% of the women earnings from peeling sheds is the only source of income.

3.3. Occupational Health Hazards

Many peeling shed workers were found to suffer from a variety of occupational health hazards like back pain, hand and leg numbness, rheumatic fever, pain in the joints, injuries, problems relating to uterus and various forms of allergies. It is surprising that the workers are not entitled to medical benefits. Previous reports also indicate complaints of arthritis, skin disorders and back pain to be common among the peelers [7]. For treatment, they mostly depend on Government hospitals. Seventy percent of them have health cards which help them to reduce expenditure on medical treatment. These cards have been issued by the Government. The study revealed that 88.2% of the workers do not have any medical insurance and that 74.6% of them have not availed life insurance policies from any entity. The workers are almost unanimous (98.3%) in their opinion that they do not face any physical or mental harassment in the peeling sheds. However, a few of the respondents (1.7%) admitted to have undergone harassment.

The sea food processing industry is growing fast with better infrastructure and quality standards. However, there is no change in the drudgery the workers undergo and they are still treated as 'casual' or 'unskilled' workers despite of the fact that they have long years of service in the sector. Further, there is no perceptible improvement in the wages

or working conditions of the workers. Top priority should be given to empowerment of fisherwomen in all fisheries development programs, research plan and policy making [8].

3.4. Socio-economic Status of Pre-processing Centre Owners

A sample of 40 pre-processing centre owners was randomly selected for the study. The peeling shed owners on an average had only 15 years experience in the pre-processing sector. The peeling sheds in the two zones selected for study, on an average, have a potential to employ 66 workers in a day and have a maximum production capacity of 1619 kg. Nearly 55.0% (22 sheds) have the capacity to pre-process shrimp in the range of 500 kg to 2000 kg per day. Five sheds have the capacity to peel 3000 kg per day or even more (Table 5). The turnover of peeled shrimp is 991 kg per day per peeling shed. The number of workers engaged in a day ranges from 10 to 50. However, 45% of the units engage more than 50 workers in a day (Table 6). The owners on an average make a profit of Rs. 2 to Rs. 3 per kg of shrimp peeled by the workers. The peeling sheds work generally 50% below capacity because of shortage of workers. New generation workers are hesitant to work in peeling sheds. Therefore, most of the shed owners get the work performed by women older than 50 years. This has an adverse effect on the turnover of peeling sheds. The monthly income from pre-processing centres, according to most of the respondents, is not quite attractive to pay higher rates of wages and incentives. To reduce cost of production eighty percent of the owners do not provide uniform and gloves. The average monthly income of 67.5% of the peeling sheds is less than Rs.25000 (Table 7). About 15% of them earn income between Rs 25000 and Rs. 35000. Only 17.5% of the owners earn income above Rs. 35000. The average family income of the owners was calculated to be Rs. 27525 per month. This is thoroughly inadequate to maintain a family. Many of the owners are indebted to financial institutions for the loans they have taken for establishment of pre-processing centres.

A number of factors which obstruct the smooth functioning of pre-processing have been identified during the study. Non-availability of manpower remains as one of the major areas of concerns for the sector. The younger generation is hesitant to work in a peeling shed due to the problems faced by workers (discussed earlier) in the field. Scarcity and irregular supply of raw materials is another conspicuous problem confronting the pre-processing facilities. Most of the centres procure raw materials from landing centres or from agents. The owners should improve their efficiency of procurement by entering into contract with specific boats or agents so as to ensure uninterrupted supplies of raw materials. Lack of cold rooms (chilled room) in many pre-processing centres is a matter of great concern, both for owners and processing plants. Absence of cold rooms force staggered procurement of fish by peeling sheds which in turn result in protracted supplies of finished goods to the processing plants. The remedy is to modernize the pre-processing facilities in tune with the emerging requirements. Many of the peeling shed owners are indebted to banks. They have availed loans for improving

the facilities to impose food safety standards. They find it difficult to repay the loans owing to low profit margins. The reported preference of the seafood industry to integrate pre-processing units with processing facilities has aggravated the misery of the owners of feeble pre processing units. The peeling shed owners find it difficult to invest in infrastructural development and quality standards improvement of their pre-processing centres because of their indebtedness to banks.

3.5. Recommendations

The fish pre-processing sector has been supplying pre-processed materials to the processing plants on contract basis. It is paradoxical that many of these units are now on the verge of closure owing to low profit margins, non-availability of women workers and inability of the owners to invest more capital for development of infrastructure and improvement of hygiene standards in the pre-processing units in tune with the emerging requirements of the export markets. The study was carried out with an objective of identifying ways and means for streamlining and sustaining the pre-processing units in Kerala. Suggestions and recommendations emanating from the study can be furnished as follows:

1. The capacity of the pre-processing sector has to be rebuilt to attain required standards in fish and fish products exports by infusing more capital. Soft loans or interest-free loans should be made available to the pre-processing facilities for development of infrastructure and quality improvements according to EU standards. In the case of those entrepreneurs who are struggling for loan repayment, loans may be renewed and interest waived.
2. The pre-processing units should be encouraged to improve their efficiency of procurement by entering into contract with specific boats/suppliers. This will ensure uninterrupted supply of pre-processed materials to the processors.
3. It is mandatory to develop cold room facility in the pre-processing centres to help them operate at full capacity and to ensure regular supply of pre-processed materials to the processing sector. To accomplish this, soft loans and subsidies must be provided to pre-processing facilities that are active and vibrant.
4. The pre-processing sector has to necessarily initiate action to make the pre-processing job more attractive and safe by improving the working conditions, upgrading the skill of the workers through training, providing opportunities for career advancement and ensuring periodical medical checkups besides giving them attractive wages and perks.
5. The present tendency of some of the peeling sheds to entrust peeling works at houses of workers may be curbed. Hygiene cannot be enforced if the work is being carried out at home.
6. Awareness should be generated among the workers in the pre-processing facilities about the programmes of the Government (ESI, health cards, welfare funds, provident fund schemes etc.), so that they could avail many facilities without much difficulty.
7. Registration of all the pre-processing facilities with local self governments, MPEDA and PCB must be made

compulsory.

8. Many pre-processing centres dump their wastes in the nearby water bodies or waste lands causing environmental pollution and health hazards. The owners of such peeling sheds should be encouraged to use modern technologies in waste management (establishment of effluent treatment plants, extraction of chitin from prawn shells, use effective micro organisms-EM- to hasten manure production from fish wastes, treatment of fish wastes with formic acid etc.). They may also be given financial assistance to set up disposal mechanisms.

9. Training may be organised regularly for workers and managers for updating their knowledge in fish quality maintenance.

Conclusion

The results of the study show that many of the pre-processing centres in Alleppey district in Kerala are not functioning at their full potential. Many of the peeling centres lack certain facilities considered as mandatory for sea food pre-processing units. The pre-processing units are contributing substantially to the employment of women but fail to provide them with attractive wages and other benefits including a comfortable working environment owing to which the younger generation is reluctant to work in peeling sheds. Many of the peeling shed owners are in indebted to financial institutions and are finding it hard to repay the debts or to develop their infrastructure as the profit margin is less. Huge amounts are earned by Government as revenue from the export of fish and fishery products. At least a small part of it may be allowed to trickle into the pre-processing sector and its workers. Efforts should be taken to register all peeling sheds in any of the government agencies like MPEDA, EIA etc to have proper infrastructure facilities and working conditions in place. Steps should also be taken to include the workers in peeling sheds in the MG scheme to ensure minimum wages are paid to the workers and also to attract more women workers into this sector. By all means the peeling sector has to be revamped by providing much assistance to rejuvenate it as it plays major role in the seafood cold chain in India.

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