



## SOCIO-ECONOMIC VIEW OF FISHERIES PROCESSING SECTOR EMPLOYEES: BLACK SEA REGION-TÜRKİYE

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**Abstract:** In this study, the socio-economic status of the employees who work in the seafood processing plants operating in the Black Sea region provinces was examined in order to reveal the social and economic data. 37 enterprises, which have a production permit from the Ministry of Agriculture and Forestry, are located in 7 provinces in the Black Sea region, where 18 provinces are located. It has been studied with 532 interviewers in 28 companies that are actively operating, with a participation of 24 questions each. 19 of the enterprises work for fish and fish products (cold and frozen storage), 4 are for snails, and 5 are for fish meal and oil processing plants. 63.9% of the employees are male. When we look at the distribution of the employees' age groups, the rate of 31-40 years was the highest with a percentage of 36.64%. Regarding the education levels, it is seen that secondary school graduates constitute the highest rate with a percentage of 38.91%. It has been detected that 99.62% of the employees have social security, and all of them take advantage of the social security institution. For the marital status, it is determined that 73.50% of the employees are married. Studies on the seafood sector, which is important in the world and in our country, reveal important data.

**Keywords:** Seafood, Fish meal, Workpeople, Plant, Questionnaire

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### 1. Introduction

Aquaculture socio-economically occupies an important business niche, constitutes a significant part of agriculture as well as being a valuable source of quality nutrition. This sector is known to provide raw materials, contribute to rural development, implement employment areas and food manufacturing (Doğan and Yıldız, 2008). Annual aquaculture and capture production is 177.8 tons according to FAO 2020 statistics of which 90.3 million tonnes originate from fisheries and 87.5 million tons from aquaculture practices. Aquaculture and capture production in Türkiye in 2021 reached 799.851 tons. The financial asset for this 2020 production had increased to 13.708.550,105 Turkish Liras. Additionally, 559.932 ton was being consumed as a food resource by human (GDFA, 2021; TSI, 2022). The seafood processing sector, with its developing economic status, takes part in important industries. Seafood processing plant factories are subject to act number 5996 veterinary services, plant welfare, food and feed law for seeking permission. Those that receive permission are registered to the food security information system (FSIS) designed by the Ministry of Agriculture and Forestry of Türkiye. There are 234 seafood businesses registered to FSIS. These are distributed to entire Türkiye; 68 in the Marmara region, 79 in the Aegean region, 38 in the Black sea region, 33 in

the Mediterranean region, 12 in the Central Anatolian region and 1 in the South Eastern Anatolia region. From the 234 registered businesses, 97 are certified for exportation to European Union countries (MAF, 2019). Seafood constitutes the only animal product that has been certified for export to EU countries however, socio-economic analysis regarding workers in the processing plant factories is quite limited. Various studies have been carried out inter (nationally) regarding mainly fisheries sector, aquaculture workers, processing plant workers, the owners of the businesses, consumer groups by several researchers (Drewes, 1982; Charles, 1988; Hunte and Oxenford, 1989; Saxena, 1989; Freire and Gracia-Allut, 2000; Supongpan et al., 2000; Yahşi, 2000; Waters et al., 2001; Sabatella and Franquesa, 2004; Villareal et al., 2004; Ünal, 2004; Çolakoğlu et al., 2006; Uzmanoğlu and Soylu, 2006; Yücel, 2006; Emre et al., 2007; Güngör et al., 2007; Kutlu and Balçık, 2007; Çeliker et al., 2006, 2008; Doğan and Yıldız, 2008; Bektaş et al., 2010; Doğan, 2010; Köse et al., 2010; CFRI, 2012; Çağlak et al., 2012; Sariözkan, 2016; Buruç, 2018).

The Black sea region of Türkiye is the 3rd biggest geographical region, covering 18 cities. The coastal distance of the region is 1685 km thus participating local fisheries up to 50%. The aim of the present study was to exhibit socio-economic status of workers in processing



plant factories in the region which holds significant economic benefits thus obtaining qualitative social datasets. Additionally, the outcomes of the research are anticipated to provide insights for the sector directors, the aquaculture processing industry, and policymakers.

## 2. Materials and Methods

### 2.1. Research Area and Processing Plant Factories

Research area, according to the data sets of the Agricultural Economic and Policy Development Institute, 75% of the total supply of Türkiye's wild fishery needs is from the Black Sea region (41.1% East Black Sea region and 34.2% West Black Sea region) (TEPGE/AEPDI, 2021). Timeframe for the study has been expanded to cover peak periods for wild fisheries catchment and shellfish season. In this direction, 7 factories including cities of Sinop, Zonguldak, Kastamonu and 10 factories in Trabzon were surveyed in December 2015, 11 factories in cities of Samsun, Ordu, and Giresun were surveyed in February 2016 (Figure 1). Processing plant companies are registered for the food security information system designed by Ministry of Agriculture and Forestry of Türkiye. Those working in the processing plant factories registered to the system, 28 businesses in total, consisted of the material of the present study. Processing plant factories included crustaceans, cephalopod, fish oil and fish meal, fresh and frozen seafood. The fact that the amount of hunting and partly aquaculture is in the Black Sea has led to the concentration of the sectors in this

region.

### 2.2. Surveys

The survey forms used in the present study consist of 24 questions. Previously applied socio-cultural surveys were redesigned for the purpose of this work (Doğan and Yıldız, 2008; Bektaş et al., 2010; Doğan, 2010).

### 2.3. Procedure

Exact counting method was applied so as to gather robust dataset regarding processing plant factories. The exact counting method is applied when all participants involved in surveys fill up forms completely (Çapkın et al., 2008; Diktaş-Bulut et al., 2021). The total number of participants, 532 people, included everyone working in processing plant companies that had been surveyed (this study covers the permanent staff; Figure 2).

### 2.4. Identification of Worker's Socio-Economic Qualifications

Survey included the data generated by the answers to those questions related to socio-cultural and demographic status of the participants follows as; age, marital status, the number of people in the family, educational status, social security status, income of the family, professional satisfaction, socio-cultural activities and food expenses.

### 2.5. Statistical Analysis

The statistical analysis was carried out using Windows Office 365. Categorical research evidence and percentage distribution were given in tabular format.

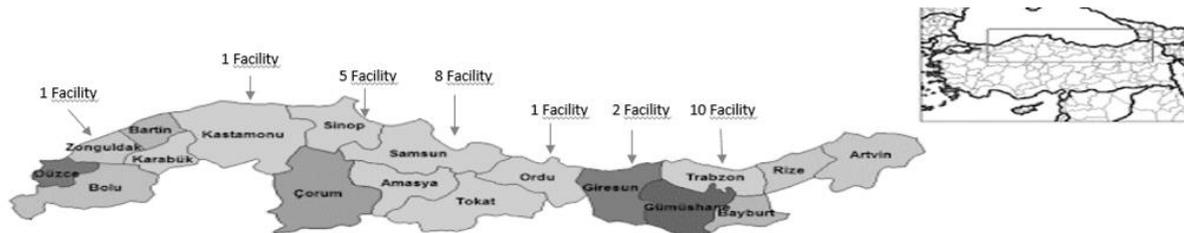


Figure 1. Distribution of the facilities by city in the survey study.

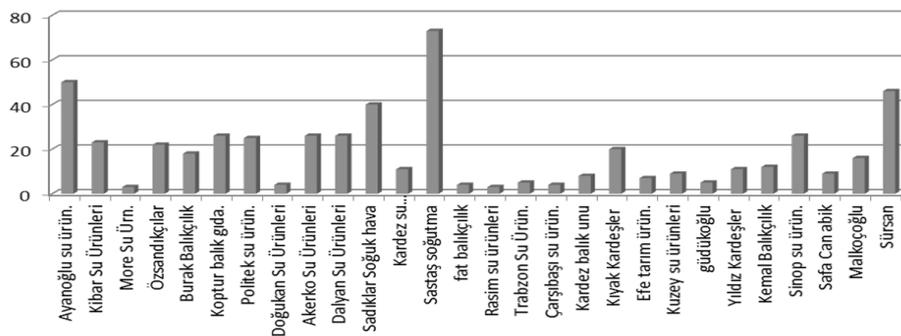


Figure 2. Number of surveyors by facilities.

## 3. Results

The distribution of factories based on cities, their processing technology, and the number of people working in the factories are given in Table 1. The results

revealed that all factories (100%) were company-based businesses. Assessments revealed that all factories had a “freshly frozen seafood section” with a 75% representation. The ratio for crustaceans, cephalopod,

fish oil, and fish meal processing factories was 12.5%. Additionally, one factory possessed more than one processing technology. In total 13 factories had 1-11 personnel, 7 factories had 12-25 personnel, 4 factories had 26-38 personnel, 2 factories had 39-49, 2 factories had 50 and onwards personnel for business operations. The city of Trabzon possessed the highest proportion, 10 in total, for the establishment location of processing plant companies.

**Table 1.** General properties of seafood processing plants in the Black Sea region

Processing technologies	Piece	(%)
Fresh and frozen seafood	22	75.00
Cephalopods and crustaceans	3	12.5
Fish meal and oil	3	12.5
Number of employed personnel		
1-11 staff	13	46.42
12-25 staff	7	25.00
26-38 staff	4	14.28
39-49 staff	2	7.14
50 ≤ staff	2	7.14

The demographic distribution of workers is presented in Table 2. The dominant sex was detected as male, with 63.3% among workers of processing plant companies. The average age of the workers was older than 30 years old, represented by 68.53%, while 31.47% of the workers were younger than 30 years old; the ratio decreased to 9.16% for 51 years old and onwards. The majority of the workers were married, represented by 71.5%, and singles and widows were represented by 25.94% and 0.56%, respectively. Educational status of the works was detected as follows; secondary school (38.91%) > primary school (35.53%) > two-years degree (11.47%) > literate (5.64%) > Bachelor in Science (3.19%) > Master in Science (1.50%) > nonliterate (0.38%) > Doctor of Philosophy (0.19%). The frequency of newspaper reading revealed that 17.67% of the workers followed the daily posts, 24.06% followed 2-3 days a week, 19.36% followed once in a week and 37.97% followed newspapers once a month. Reading habits of workers were detected as 40.79%, 21.05%, 20.68%, and 17.11% for never reading, one book in a year reading, more than a book in a year reading, and one book in a week reading, respectively.

The use of social media and the internet has increased rapidly, thus the frequency of internet technology utilization is given in Table 3. Internet utilization was 70% among workers of which the majority indicated as 2-3 hours in a day. Social media account holders were represented by 58.83% while 39.29% of the workers did not have a social media account. The number of social media platform use varied among workers; 33.27% indicated as one account use, 33.27% indicated 2 accounts and 10.72% indicated 3 and more accounts on social media. The reason to use the internet was detected

as follows; “communication with friends > daily news > researching > listening to music or videos”. The number of workers who did not want to respond to this question was remarkably high thus drawing the authors' attention.

**Table 2.** Demographic properties of employees in seafood processing plants in the Black Sea region

Social structure of employees	Piece	(%)
Gender status		
Female	192	36.1
Male	340	63.9
Age groups		
<20	20	4.50
21-30	148	27.82
31-40	195	36.64
41-50	121	22.73
51-60	33	6.20
60>	11	2.06
Unanswered	4	0.9
Marital status		
Widow	3	0.56
Single	138	25.94
Married	391	73.50
Education status		
Illiterate	2	0.38
Literate (not educated)	30	5.64
Primary education	189	35.53
Secondary education (including high school)	207	38.91
Associate degree	61	11.47
License education	17	3.19
Post graduate	8	1.50
Doctorate	1	0.19
Unanswered	17	3.19
Newspaper reading frequency		
Everyday	94	17.67
2-3 times a week	128	24.06
Once a week	103	19.36
Once a month	202	37.97
Unanswered	5	0.94
Book reading habit		
Never read	217	40.79
1 time per week	91	17.11
1 time per year	112	21.05
More than once a year	110	20.68
Unanswered	2	0.37

**Table 3.** Internet and social media usage cases of employees in seafood processing in the Black Sea region

Internet usage frequency	Piece	(%)
2-3 hours a day	209	39.29
2-3 hours a week	106	19.92
1 hour per month	58	10.90
Not using	159	29.89
Do you have a social media account?		
Yes	313	58.83
No	213	39.29
Unanswered	6	1.88
Social media count		
1	177	33.27
2	97	18.23
3	41	7.71
4	10	1.88
5 and above	6	1.13
Not using	200	37.59
Unanswered	1	0.19
Reason for using the internet		
Reading news	102	19.17
Doing research	65	12.22
Communication with friends	116	21.80
Listening to music and watching videos	31	5.83
Unanswered	218	40.98

Table 4 indicated the social security status of the workers of which almost all (99.62%) had social security apart from 2 workers, represented by 0.38%. The types of social security revealed that all (100%) workers were covered under the Social Insurance Institution (SSK). The position of the workers was distributed as 66.73% operatives, 4.32% headmasters, 4.89% engineers, 5.64% technicians, and 18.42% others (drivers, accountants, administrative staff) among workers. The job satisfaction of seafood processing plant workers was detected as follows; 3.38% very satisfied, 45.86% satisfied, 39.47% tolerable (not bad), and 4.89% not satisfied. The salary satisfaction of the workers was detected as 22.74% satisfied, 30.45% not satisfied and 43.05% tolerable (not bad). Monthly salary distribution was identified similarly as 38.72% 1201 TL and lower income and 37.40% 1501 TL and higher income. Similarly, the ratio of income and the number of people was detected comparable; 19.55% (1201-1500 TL) and 20.11% (1501-2000 TL).

**Table 4.** Social security and economic structures of employees in seafood processing in the Black Sea region

Social security and economic structure of employees	Piece	(%)
Social security status		
Have social security	530	99.62
No social security	2	0.38
Social security institution		
Social insurance institution (SSK)	530	100
Pension fund	-	
Bağkur	-	
Special insurance	-	
Title		
Worker	355	66.73
Foreman	23	4.32
Technician	30	5.64
Engineer	26	4.89
Other (driver, accounting etc.)	98	18.42
Job satisfaction		
Very pleased	18	3.38
Satisfied	244	45.86
So so	210	39.47
Not glad	26	4.89
Unanswered	34	6.40
Salary satisfaction		
Yes	121	22.74
No	162	30.45
So so	229	43.05
Unanswered	20	4.03
Monthly average income (TL)		
<500	31	5.83
501-949	83	15.60
950-1200	92	17.29
1201-1500	104	19.55
1501-2000	107	20.11
2001>	92	17.29
Unanswered	23	4.33

Accommodation types of the workers based on their economic and social security status were provided in Table 5. The rational distribution of the number of people working while sharing the same house was detected as 2 > 1 > 3 > 4 > 5 and onwards. The number of people was found to be three times higher for 4 people and higher (399 persons) compared to 3 persons and lower (133 persons). The ratio for accommodation ownership revealed that 52.91% of the workers own their accommodations, 22.58% are living in rental accommodations, and the remaining 22.92% utilized other facilities. The type of accommodations was detected as follows; 40.04% in the apartment house, 54.51% in a detached house, and 4.89% in others. The sizes of the accommodations were detected as follows; 57 accommodations (10.71%) <90m<sup>2</sup>, 208 accommodations (%39.10) range between 90m<sup>2</sup>-120m<sup>2</sup>, 138 accommodations (%25.94) 120m<sup>2</sup>-130m<sup>2</sup>, 84 accommodations (%15.79) 130m<sup>2</sup>-150m<sup>2</sup> ve 38

accommodations (%7.14) 151m<sup>2</sup>. The heating type of the accommodations was detected as follows; 70.49% stove, 21.24% central heating, 6.95% natural gas central heating, and 1.32% electrical heating.

**Table 5.** Social security and economic structures of employees in seafood processing in the Black Sea region

Social security and economic structure of employees	Piece	(%)
Number of employees living in the same residence		
1	195	36.65
2	253	47.56
3	62	11.65
4	13	2.44
5 and Above	9	1.7
Number of persons in the household		
2 people	6.58	35
3 people	18.42	98
4 people	33.08	176
5 people	29.70	158
6 and above	12.22	65
Residential ownership		
Host	282	52.91
Tenant	119	22.58
Other (staying with mother, father, grandfather etc.)	121	22.92
Unanswered	10	1.89
Housing type		
Private	290	54.51
Apartment	213	40.04
Other (slum)	26	4.89
Unanswered	3	0.56
Housing size (m <sup>2</sup> )		
<90	57	10.71
90-120	208	39.10
120-130	138	25.94
130-150	84	15.79
151 ≥	38	7.14
Unanswered	7	1.31
Heating type of the house		
Stove	375	70.49
Heater	113	21.24
Natural gas	37	6.95
Electricity	7	1.32

#### 4. Discussion

The socio-economic situation of the workers in processing plant factories of the Black sea region was presented in the present study. The surveys conducted in the region revealed all, twenty-eight, companies were run as corporations. Çapkin et al. (2008) reported one company exception in 10 companies investigated in terms of company management in Beyşehir surrounding area. Çağlak et al. (2012) reported all companies run as corporations in terms of management in Balıkesir

province. The present study indicated that seafood processing plant companies are generally run as corporations as it was reported by previous studies. Majority of the companies (3/4) operating in the region utilized fresh and frozen seafood technology. Other companies shared equal contributions for their processing type including crustaceans and cephalopods as well as fish oil and fish meal. In a study conducted by Çağlak et al. (2012) reported fresh and frozen seafood products as well as cephalopod and crustacean products were at the forefront in Balıkesir province. The same authors reported bivalve processing technology in the region, although being lower in terms of production volumes. The comparison of these two papers revealed a unique part for the present study in regards to fish oil and fish meal while being similar for the majority of the processing technologies in fresh and frozen seafood as well as cephalopod and crustacean technology. Investigations revealed that companies possessed more than one processing technology. Additionally, it was presumed that companies operating in the region preferred extended self-life compared to investigating new tastes mainly due to the traditional tastes of the consumer's preferences. The highest proportion of workers was detected in companies that had employees ranging between 1 to 11 out of 28 companies that the survey conducted among 532 workers. In a study to reveal the situation, problems, and their solutions of the seafood processing plant companies Duyar and Bayraklı (2005) have previously reported a 50% ratio for employees of 1-11 workers in 6 companies investigated with a total number of 89 workers in Sinop city. Çağlak et al. (2012) reported a 62.5% ratio of employees ranging between 1 to 11 in 5 companies out of 8 seafood processing plants that were surveyed with a total number of 120 workers. The comparison of the literature revealed that the ratio of 1 to 11 workers in seafood processing plant factories was similar to the previous investigations. Thus, in the shed of the current literature, the number of factories employing 1-11 workers is estimated to be 45-60% throughout Türkiye. This is thought to be due to the use of a low number of employees mostly for general operations such as sizing and crating as well as logistical actions instead of delicate processing technologies. The results revealed 340 male employees and 192 female employees among 532 workers being surveyed in the seafood processing plant factories. Çapkin et al. (2008) reported that Çağlak et al. (2012) detected a higher number of female employees. Investigations revealed that such differences were related to the body strength of male employees mostly working in fresh and frozen seafood processing requiring heavy lifting while female employees were assigned to delicate positions such as fillet and crustacean processing due to their familiarity with such operations. As fresh and frozen seafood processing was dominant in the region, in a way, explained the sex differences observed in the gender groups. It was detected that 68.96% of the

workers were under 40 years old. Previous literature revealed that the dominant age group for sea food processing factories were under 40 years old (Yücel, 2006; Çapkın et al., 2008; Doğan and Yıldız, 2008; Tokaç and Dinçer, 2011; Çağlak et al., 2012). Similar to other divisions of aquaculture, seafood processing sector representatives prioritized the employment and labour force thus hiring younger employees. SEKAM (2011) world family symposium indicated that family bonds and marriage is crucial for the social status of Türkiye. The marital status of Türkiye based on Türkiye Statistical Institute (TSI, 2015) data revealed that 62-67% were married and 22-29% were single in the Black sea region. The survey of the present study reported 73.5% married and 25.94% single among participants. The results of the survey revealed that participants cared about marriage as indicated in the report of the symposium and TSI data. TSI (2018) data indicated the graduates of primary school, secondary school including high school degree, university degree (including 2 years and 4 years education), post-graduate degree (masters in science) and, doctor of philosophy in the Black sea region on Türkiye as follows, 38.3%, 35.8%, 13.5%, 1.06%, 0.25% respectively. The results of the educational level detected in the present study were in correspondence with the national statistics. Çağlak et al. (2012) reported the ratio of university degree graduates as 14% in a study conducted on the Balıkesir city processing plant factory employees. The survey results in regard to the ratio of illiterate employees indicated the development of Türkiye in the field of education. The ratio of university graduates (2 years and 4 years' degree) pointed out the perspective of the sector towards educated manpower while the high ratio found in primary and secondary school level was due to increased need of operatives in the factories. The written media statistics revealed a decrease in the circulation of journals and magazines (TSI, 2017). Çakır et al. (2009) reported an irregular reading of daily newspapers as 28.9% while 9.4% was detected once a weekly basis in the survey conducted in Kayseri city. In the present study, the highest ratio of daily newspaper reading was detected as 37.97% once a month basis, the highest of the previous studies, thus indicating the ratio is decreasing as reported in the literature. This may be due to the increased ratio of online newspaper reading on social media platforms. Such a situation is in accordance with the increased use of the internet. Türkiye was the 86th in the Human Development Report published by the United Nations. In this regard, reading rates are quite low in Türkiye, as detected in the present study's associated answers to the question, listed in Table 2. Türkiye Reading Culture Research revealed that 70% of the participants do not read books, while a more recent study reported a decrease in the ratio down to 36% (OKUYAY, 2019). Çoban et al. (2018) remarked the reading habits of university students completed 1-5 books within one year as 48%. Çağlak et al. (2012) reported the ratio of non-

readers as 46% and reads more than one book in a month as 15% among the employees of the processing plant factories operate in Balıkesir city. The present study carried out among the employees of processing plant factories operating in the Black sea region revealed similar results in regard to reading habits with that of entire Türkiye, highlighting reading habits of the country (non-readers as 40.79%, once in a month reader 17.11%, once in a year or more reader 41.73%). Recent studies as well as the present studies suggest reading habits are increasing. The use of the internet is powerful for instant access to updated news, yet the uncontrolled news and addiction to excess use constitute its downsides. Internet addiction is explained by excessive time spending activities on the internet and being incapable of controlling the urge towards it (Leung, 2004; Simkova and Cincera, 2004). The most significant factor of this addiction is the time spent on the internet is much longer than those of non-addicted (Coa and Su, 2007). According to the TSI 2016a datasets, the number of houses with an internet connection was 76.3% while the ratio of internet use was reported as 61.2%. In the present study, the use of the internet was detected as 70.11%. Durak and Seferoğlu (2016) reported daily internet use as 4 h and 37 min from PC and tablets, while mobile data use was indicated as 2 h 51 min. The daily use of the internet for the employees of the seafood processing plant factories was 2-3 h for 39.29%. Internet use was reported as 73.2% according to TSI, 2013 while it reached to 82.4% in 2016. The study indicated the ratio of social media users as 58.83% and the differences were thought to be due to age and educational status. A majority (33.27%) of the employees were detected to use only one social media account, the ratio was down to 1% for multiple social media account users. Aydın (2016), as well as İnce and Koçak (2017), reported more than one social media account. The main reason for internet use was due to communication with friends in the present study. This was followed by daily newspaper reading, researching, and listening to music or videos. TSI (2016a) reported similar outcomes in regard to frequency of internet use; social media, messaging friends, watching videos, online newspaper and magazine reading, and researching health-related topics. The outcomes of the present study associated with internet use and social media were in accordance with TSI datasets. Additionally, no sense of internet addiction was noticed among the participants who indicated the use of only one social media account mostly for communication with friends as well as reading daily newspapers. Legally enforceable rights of the workers revealed that almost all workers (530 persons) were socially and economically covered. Previous investigations carried out in the aquaculture sector revealed that 60-99% of workers were covered by social security status (Çeliker et al., 2006, 2008; Daşdan et al., 2008; Doğan and Yıldız, 2008; Çağlak et al., 2012). Alterations in the social security legislation led to all workers being covered by the Social Insurance

Institution (SII) in the present study. The distribution of workers based on job titles revealed operatives represented the highest proportion, 66.73% as typical in the seafood processing sector. Similarly, previous studies conducted by Duyar and Bayraklı (2005), Çapkın et al. (2008), Çağlak et al. (2012), and Altunel, (2021) reported high numbers of operatives. The cumulative percentage of workers in regard to job satisfaction was up to 85.33% including satisfied and tolerable answers, only 4.89% were not satisfied. A study conducted in the wild fisheries sector revealed 85.9% job satisfaction based on cumulative answers of satisfied and moderate (Güngör et al., 2007). Similar results were observed in a study conducted in Balıkesir city with 88% satisfaction (Çağlak et al., 2012). The outcomes of the present study revealed that seafood processing plant factory workers operate in the Black sea region assessed based on job/labour by the business owners and the results were in accordance with the literature. According to the 2015 and 2016 minimum wage, there was 36.84% gained a salary between 950 TL to 1500 TL, this was confirmed by the number of operatives however for those under gaining under minimum wage, represented as 21.43%, and for those gaining higher than minimum wage, represented as 37.4% indicated that seafood processing sector prioritizes the experience and technical expertise for salary distribution. The results of the present survey revealed that the seafood sector is not different than other sectors in regard to the salary of operatives. In 1989, new legislation was put in place to ensure mutual minimum wage among all sectors including agriculture and forestry thus Committee of Minimum Wage declared a uniform salary range regardless of sectoral differences (Eser and Terzi, 2008). TSI datasets of 2015 and 2016 revealed that the majority of the workers desired an increased salary within the investigation of the poverty threshold. Within this context, only one salary was not sufficient for those living in the same household, thus the ratio of 2 and 3 people working was detected as 59.21% sharing the same household. Türkiye's average household size is 3.5 (TSI, 2016b). In a study conducted to reveal the socio-economic status of fishermen, Sağlam and Karadal (2016) reported owing 0-3 children in 54% of the families, therefore 3-5-person family structure can be estimated. In the present study, the highest proportion of 4-person family structure was detected with 33.08% which was in parallel with the country statistics and previous studies. A significant indicator of the socio-economic status, 52.91% of the participants was house owners. Other studies conducted among the workers of aquaculture sector reported 51.6-76.76% house owners (Çeliker et al., 2006, 2008; Doğan and Yıldız, 2008; Doğan, 2010; Çağlak et al., 2012; Sağlam and Karadal, 2016; Çağlak et al., 2018). The fact that the proportion of house ownership was higher than 50% in all studies, implies the significant perception regarding owning the accommodation. Investigations revealed that detached houses were preferred thus the ratio of 54.51%

was detected. Harvesting and agricultural activities have long been a part of the Black sea region's culture. The outcomes of the present study confirmed the situation. In Türkiye, 80% of the houses are at an average of 100 m<sup>2</sup> in usable open space (Anonymous, 2016). Çağlak et al. (2018) reported that seafood retailers in Rize lived in an average of 90-130 m<sup>2</sup> open space of houses, with a 55% proportion. Surveyors indicated living in 90-130 m<sup>2</sup> houses with 65.04%. This finding was in accordance with the previous studies. The heating type of the accommodations was mostly stove, which represented as the highest proportion (70.49%). Çağlak et al. (2012,2018) reported the heating type as a stove in 53% and 77.5% respectively, in two different studies. It is estimated that the higher proportion of the stove as a heating type, higher than the Türkiye average (57.1%), may be due to type of the accommodation, region, and availability of natural gas in the neighbourhood. Additionally, similar results were reported in previous studies.

## 5. Conclusion

Consequently, the majority of the seafood processing plant factories workers were detected to gain minimum wage as a result of socio-economic investigations carried out. Additionally, the vast majority of the workers were satisfied with their job and almost all were covered under the social security umbrella. The high proportion of workers under social security was observed mainly due to legal obligations in regard to improvements to workers' welfare as well as employer sensitivity. Rental expenses, observed in a low proportion of the workers, caused to stipulate economical drawbacks significantly. As the vast majority of the workers were higher than 30 years old indicating the importance of experience in the seafood processing sector as well as suggesting there may be problems for experienced workers in near future in case of a decrease in new attendees. The vast majority of the workers were male indicating the regional seafood processing factories required mostly body strength, operating in fresh and frozen seafood technologies. Survey results revealed the increasing use of the internet both in Türkiye and globally, led to reading newspapers online thus resulting in a decline in hard copy newspapers. Similar to all sectors, semi-skilled employee requirement is a problem for the seafood processing sector. The number of persons living in the same accommodation was detected as 3-5, as indicated by national reality. The number of persons working in the same house higher than 2 indicated economic problems. As the increase of employees' salaries is dependent on employers' economic power, incentives supporting employers will surely reflect on employees' income. The increase in seafood processing product range will stimulate profitability and employment. Therefore, incentives offered by authorized organizations towards delicate products and novel processing technologies will stimulate the sector for innovator solutions instead of

regular fresh and frozen seafood processing. Seafood technology is an innovative, dynamic sector, if supported financially, has significant potential to eliminate socio-economic problems. Developments in seafood technology-related sectors emphasize the importance of fisheries for both Türkiye and the world.

#### Author Contributions

The percentage of the author(s) contributions is present below. All authors reviewed and approved final version of the manuscript.

	M.A.A.	E.Ç.
C	50	50
D	50	50
S	50	50
DCP	50	50
DAI	50	50
L	50	50
W	50	50
CR	50	50
SR	50	50
PM	50	50
FA	50	50

C=Concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision, PM= project management, FA= funding acquisition

#### Conflict of Interest

The authors declared that there is no conflict of interest.

#### Ethical Consideration

It is an article produced from a master study using research data before 2019. For this reason, ethics committee approval is not required.

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