

Social, Legal and Welfare Justice to Sivakasi Fireworks workers – An Analytical study

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Abstract: -Fireworks are regarded as one of humanity's greatest inventions in the area of entertainment. Half of the country's firecrackers are made in Sivakasi. A crucial element for improving employee performance, productivity, and profitability is through health, safety, and welfare. When the employees have access to factors like health, safety, and welfare, there is a chance to enhance the organization's reputation, productivity, and workplace morale. It is imperative that the fireworks business offer all the facilities required for better work-life balance for its employees. The risk in the firework industry has made a considerable demand for protection for the workers. Thus, the issues faced by workers in the fireworks business has been directly impacted by this study. Additionally, this study has tried to investigate adequacy of pay, welfare services, workplace sanitation and cleanliness, job satisfaction factors, and the future implications faced by this sector. The researchers tend to identify the impact of Supreme Court decision of green firecrackers both on the workers and the industry.

Keywords: Sivakasi, Safety, Workforce, Welfare, Working conditions.

1. Introduction

Sivakasi's economy is based on three key sectors. They are firecrackers, matchbox manufacturing, and printing. The national nodal center for fireworks manufacturing is Sivakasi which is located in Virudhunagar District, Tamil Nadu. As per the report, around 70% of the fire matches and firecracker industries produced in India are from Sivakasi. Since the atmosphere is hot and dry, it is suitable for the manufacturer to produce firecrackers within the town. Earlier, raw materials were brought from Sattur but due to high power and production costs that were unaffordable, they were discontinued. Kerala and Andhra Pradesh procure raw materials for these industries. It took three hundred days to complete what might have been consumed in three hours on Diwali days. nearly all of which were spent working overtime.

Sivakasi saw the emergence of the first fireworks industry in the early 20th century. The production of sparklers was delved into by Mr. A. Shanmuga Nadar and Mr. Ayya Nadar, which were then the most popular item in the small fireworks family and were at the time imported from the UK and Germany, after seeing some success with safety matches, color matches, and star matches. In order to introduce a system of licensing for manufacture, possession, and sale, the Indian Explosive Rules were enacted in 1940. The National Fireworks, Kaliswari Fireworks, and Standard Fireworks were famous fireworks that were prominent in the year 1942. Throughout India, these three factories started marketing their products.

The 1934 Central Excise Duty on Matches sowed the seed for modern family fireworks. Only a few factories existed in Sivakasi, Trichur, and Rimjalakuda, Kerala, before World War II. War prevented pyrotechnics and firecracker imports from 1938 through 1944. This shortfall boosted the fledgling indigenous industry.

The 1940 Indian Explosives Rules mandated licencing for manufacturing, possession, and sale. The first organised factory with safety safeguards was founded in 1940. The market scarcity allowed seasonal factories to work during off-season and stock up. After World War II, the indigenous industry expanded as raw material imports resumed. In 1942, National Fireworks, Kaliswari Fireworks, and Standard Fireworks were notable new factories. Three factories marketed their products across India. These were replaced at 10 each year. In 1923, there were 1 or 2 factories, 3 in 1942, and 189 by 1980. Sivakasi has 450 factories by 2001.

Even though sivakasi is into fire crackers and the concept of green crackers which has its first face during the 2018. These firecrackers are produced using comparatively less harmful raw materials and additives which reduce emissions. The production of new formulated chemicals was approved by National Environment Engineering Research (NEERI) and Petroleum & Explosives Safety Organisation (PESO). This new fire crackers were launched in the year 2019. The Supreme Court Judgment in Arjun Gopal v. Union of India (2018), imposed a ban on the sale of firecrackers by enforcing certain conditions. The main aim was to control the air pollution which is alarmingly increasing. In this regard the Tamil Nadu Fireworks and Amorce Manufactures Association (TANFAMA) also agreed to abide by the green cracker rule. Thus, the Council of Scientific and Industrial Research (CSIR), National Environment Engineering Research (NEERI) and Petroleum & Explosives Safety Organisation (PESO). After the decision of the Supreme Court few of the states have banned firecrackers, the states like Delhi, Punjab, Haryana, West Bengal and Tamil Nadu. Even though complete ban is not provided they have provided time frame as well as green fire crackers. The limited ban of the firecrackers had a negative impact on the manufacturers and as the end result on the employees.

2. Objectives

- to analyze the opinion on the health, safety and welfare measures of workers in Sivakasi's firework industries.
- to study the awareness level of the workers towards health, safety, and welfare methods.
- to analyze the changes brought after the Supreme Court Judgement in Green Crackers.
- to propose suggestions with the help of the findings of the study.

3. Methods

The study is carried out in the Virudhunagar District, particularly in the vicinity of Sivakasi. The research uses basic random sampling to choose 206 respondents from the roughly 2500 overall fire cracker workers in Sivakasi. The study employed the survey approach, and the researcher held interviews with workers in the firework industry to learn more about the key elements, such as health, safety, and welfare measures. To gather data, the researcher employed interview scheduling methods.

This study will shed further light on the issues facing the current workforce in the fireworks sector. Additionally, it will address ways to enhance the socio-economic circumstances, health issues, welfare programs, and safety issues in the fireworks sector among the research area workforce.

4. Theoretical framework

Sivakasi, which is also called as “Little Japan of India”, is well known for its firework industry, which provides many residents with the means of subsistence. Diwali and firecrackers go hand in hand. The “Festival of Lights” is marked by the lighting of fireworks. During Diwali the sparkly atmosphere is a special treat for children every year. The fun starts when crackers go off on every street, which is loved and enjoyed by all in the world. Sivakasi which is located in Tamil Nadu’s Virudhunagar district is renowned for producing high quality crackers. Nearly 90 % of fireworks are produced in this small town, which is known as the center of India’s firecracker industry and is home to 80,000 manufacturers. In India, there are up to 400 producers who supply fireworks in the country’s expanding firework market. [1]

The fireworks industry is always blamed for its poor safety standards and paying a pittance to workers. The workers who work in the business also have terrible scars, such as a shattered leg or head, or a hand burned by explosives, and many people have persistent lung issues, respiratory issues, bad visions etc. People working in Sivakasi does not have alternate means of livelihood. It can be seen from the newspaper reports that accidents or explosions happen every year and takes the lives of people.

Table 1: Showing the causalities/death caused in various Firecrackers units in Sivakasi

Sl No	Year of the Accident	Location /Area in Sivakasi	Number Causalities/Dead	Reasons for the Accident
1	2000	Sevalpatti	3	filling chemicals for manufacturing crackers
2	2002	Sivakasi	3	Explosion in illegal unit
3	2005	Meenampatti	20	blast at a firecracker unit
4	2006	Sivakasi Region	7	filling chemicals for manufacturing crackers
5	2010	Sivakasi	7	due to friction when mixing chemicals
6	2011	Kalaiyarkurichi	6	Explosion in illegal unit
7	2012	Mudalipatti	52	Explosion
8	2013	Kichanayakkanpatti	3 dead 19 injured 1 child	negligence
9	2016	Chokkalingapuram	Explosion of Industry	Mixing industry
10	2017	Vetrilai Oorani -	5	due to friction when mixing chemicals
11	2018	Ramuthevanpatti	4	due to friction when mixing chemicals
12	2018	Kakkivadanpatti	4	Explosion in illegal unit
13	2019	Nathikudi	3	due to friction
14	2020	Chokkalingapuram	1	due to friction when mixing chemicals
15	2020	Sippiparai	8 dead 9 injured	handling chemicals to manufacture fancy variety

				crackers
16	2021	Kalayarkurichi	5	filling chemicals for manufacturing crackers
17	2021	Thayilpatti	2 women 1 child	Explosion in illegal unit
18	2022	Kalathur	4	blast at a firecracker unit
19	2022	Nathampatti	4 dead 8 injured	mixing of ingredients in the chemical filling shed
20	2022	Amathur	1 dead 2 injured	fire accident in a cracker unit
21	2023	Marknathapuram	1	Blast in the raw materials room

Source: Times of India, The Hindu.

In general, firework factory license is granted only after clearances from the local police, pollution control Board, health, and other agencies. However, due to a lack of coordination and the absence of routine official checks, many companies fail to meet safety standards. Workers are expected to master complex techniques such as chemical and explosive mixing on the job. As per the table mentioned above frequent accidents are the main problem in Sivakasi firework business. According to figures from the year 2013 as mentioned above, Sivakasi was the site of fatal accidents where death and injury is caused to many workers.

The welfare measures are designed to consider the sociopsychological requirements of the workforce, the special requirements of a certain technology, the organizational structure and procedures, and the sociocultural context that already exists. In organizations and society, it fosters a culture of work dedication, ensuring increased employee productivity and job satisfaction. The employees' perception of the management's interest in their wellbeing as a consequence of the welfare initiatives contributes to their honesty, dedication, and loyalty to the company. The staff work with complete passion and vigor, which leads to an increase in productivity and, eventually, a rise in profit.

The welfare measures take a while to have results. Since it would take time, the management must be patient in providing the workers' welfare amenities. The management must consult with the people who will use the facilities before deciding on a welfare benefit for the staff. The welfare of the workforce is also impacted by how and in what way they are expected to operate the machinery set up in the factory to carry out the production processes. Some mechanical devices that have been installed are hazardous by nature if they are not installed or maintained correctly. Some of the machinery placed in the plant required technical expertise on the part of the operators, and if young people were permitted to run them, their lives would likely be in risk.

There are various legislations such as Explosive Legislation Act 1884 and the explosive rules 2018 help in safety regulations and procedure to prevent explosions. Lack of training, engaging in contract employees, tired employees, drunken employees and minors are employed in various fireworks industries. Workers in these industries use low cost explosive pyrotechnic devices known as fireworks used for aesthetic and amusement purposes. Various health related issues are a constant threat to thousands of workers in Firework industry. The workers face headaches, impair mental acuity, heart problems, respiratory, breathing problems, irritation of skin, eyes, thyroid etc., even resulting in death of many.

The main resource for any industry's achievement of its goals and for achieving economic success is its workforce. Making immediate arrangements for transit, performance-based prices, and canteen facilities is necessary to promote the workers overall well-being. Individuals' physical, mental, and emotional well-being is referred to as their welfare. Therefore, management should consider enhancing employer well-being in the future by consulting with the workforce. The organization can implement various recreational amenities that will lessen the stresses that employees must deal with and that impact the organization's competency, as well as ways to instill excitement and enthusiasm in its workforce. The researchers in this research is trying to bring the social, legal and welfare facilities provided to the workers in the firework industry of Sivakasi. In this research the researcher's also tries to identify the changes brought in the working atmosphere of fire workers due to the introduction of the green crackers in India.

4.1 Legislative Framework for Sivakasi Firework Workers

- **Factories Act 1948**

The Factory Act is a key piece of law that was created in 1881 and governs the working conditions of employees. It lays out the procedures for sanctions in the event that any of the Factory Act's rules are violated. The provision gives importance to health, safety, working conditions, and potentially dangerous practices for employees. The Factories Act went through series of amendments and changes during these years. It places a strong emphasis on issues such as working conditions, minimum age of workers, paid time off, and the welfare of factory workers. This statute is based on the guidelines established by the 1937 Factory Act of Great Britain. The Factory Act of 1948 governs all day-to-day operations in factories. The Bhopal Gas Tragedy in 1984 made people aware of the pollution and dangers of factories, necessitating the need for the government to move quickly to enable revisions to the Act. All factories that employ at least 10 people when using electricity and at least 20 people when there is no electricity are subject to the Factory Act.

The main provisions of the Act are safety, machine guarding, health and cleanliness, drinking water, washing and latrine facilities, lunch rooms and rest rooms, sitting arrangements, first aid and dispensary facilities in factories employing more than 500 workmen, crèches where more than 50 women are employed, welfare officer where more than 500 workmen are employed, spittoons, holidays with wages at the rate of one day for every 20 days worked, and weekly hours.

The Act provides importance for the "Labour Welfare" which refers to the services offered to employees within and outside of the plant, including canteens, rest and leisure areas, housing, and any other amenities that enhance employee wellness. The overall well-being and productivity of employees are the focus of welfare initiatives. Early on in the industrial revolution, manufacturing employees' welfare programmes did not get enough attention. Indian manufacturing employees have always endured horrible working conditions. Workers essentially had no choice due to poverty and industrial owners' abuse. Due to a rise in industrial activity in the second half of the 19th century, several attempts were made to improve the working conditions of the workforce through the recommendations of the Royal Commission. After recognizing the shortcomings and flaws of the preceding law, the Act of 1948 has tried to accomplish certain criterions. The term of "Factory" was expanded to cover any industrial business employing 10 or more people that uses power or any industrial establishment employing more than 20 persons that uses no power. Some changes are raising the age requirement for children to be employed from 12 to 14, reducing the number of hours that youngsters can work from 5 to 4 and a half, explicit and special attention is paid to the health, safety, and welfare of all types of workers. Children are not allowed to work between the hours of 7 p.m. and 6 a.m.

The occupational health benefits, acceptable working hours, and a pay that is adequate are the three main components of welfare measures. The term describes a person's whole health, including their physical, mental, moral, and emotional wellbeing. The management should take keen initiatives to take necessary steps for providing welfare measures for their workers. Therefore, employers or occupiers of the Factory are required to take certain precautions against the hazards of a worker operating a machine or other mechanical device to ensure their safety and welfare. This is done in order to secure the safety of life of the workers who are required

to operate machines and other mechanical devices. It is mandatory that compliance of the provisions of the Act is necessary for safeguarding workers safety, health and welfare.

- **The Tamil Nadu Factory Rules, 1950**

The Factories Act is an Act that was created to protect worker welfare, health, and safety on the job. The Tamil Nadu Factory Rules, 1950 were also introduced in Tamil Nadu as per the Factories Act for safety, welfare and health of Industrial workers in the State.

- **Indian Explosive Rules, 1940:**

The Indian Explosives Rule was passed in the year 1940, in order to bring a system of licensing for manufacturing, possession, and sale of explosive substances. The Act is also applicable to Fire workers Industry for protecting the workers. Explosives substances are harmful to the society as well as the environment. In India the usage, production of explosive substances is governed under the Explosive substances Act, 1908. Explosive substances can be in mixture, solid, liquid, chemically formed for producing gas which will result in safety and health of workers. Therefore, the factory should follow various precautions and safety procedures when working in hazardous industries even in the case of firecrackers. The main provisions of the Act are punishment provided to persons who use the explosive substances to endanger life or property. Even an attempt to cause explosion or keeping such kind of explosive substances to endanger the life or property is also considered to be punishable under this Act. The provisions are framed in such a manner that even when a person tries to make or possess such explosive substances or supply materials or abets in the commission of offences with unlawful object are punishable under the Act.

The first organized fire crackers factory was structured based on the Indian Explosives Act 1940. It was built based on several precautions and safety measures. Thus, it can be seen that certain provisions of the Act can be still applied to the firecrackers industry.

4.2 Literature Review:

Several studies have been undertaken to study various factors that influence Sivakasi employees. To analyze the health, safety, and welfare of the workers at the standard fireworks industries in Sivakasi, the researchers reviewed the significant studies conducted on the topic to identify the fact that whether the decision of the Supreme Court on green crackers has any impact on the health, welfare and safety of workers and employees. An analysis of the literature review is provided below.

Analytical study in employees job satisfaction in standard fireworks at sivakasi, Tamilnadu in his study mentioned that most workers in the study unit are happy with their working environment, welfare service, safety precautions, and labor relations. They could still be improved. Employees in the fireworks industry may have greater job satisfaction. They believed that their employment contributed to an improvement in their standard of living and income. [2]

A Study on Family Income Management in Sivakasi; according to the survey conducted in this study, there are not enough budgets, accounts, saving goals, or other elements influencing the effective administration of family income. Only 44.5% of respondents reported having a family budget. [3]

Study on Attitude of Fireworks Manufacturers in Sivakasi Towards Eco-friendly Fireworks, the awareness, acceptability, and adaptability of environmentally friendly fireworks among fireworks owners in Sivakasi are the main topics of this essay. Setting up a training program to educate the producers of fireworks on eco-friendly technology will assist the manufacturers of fireworks in quickly using the technology in their operations. [4]

A Study on Problems Pertaining of Women Labourers in Fireworks Industry -With Special Reference to Sivakasi According to the findings of this study, the issues facing women workers in the fireworks business can be divided into five categories: socioeconomic issues, workplace safety issues, work life issues, and sexual harassment issues. Only with the assistance and backing of management and the government in the study area can the issue be resolved.[5]

Industrial Safety and Well-Being of Fireworks Employees in Sivakasi, the researcher examined the safety precautions taken by the employees who work with fireworks. The majority of respondents stated that they lack safety equipment. As a result, they believe they need more protective gear, such as gloves and facemasks, when working around chemicals and machinery in factories. They also stated that they should attend a medical camp for six months and that they should have access to restrooms during breaks. The staff will be working in their workplace in peace and safety if the factory adopts some of these suggestions. [6]

A study on job satisfaction of fireworks industry employees with special reference to Sivakasi taluk, this study finds that organizations don't have the kinds of interactions between employers and managers that deserve careful examination. Other areas where the organization falls short include working conditions, the canteen, restrooms, awards and recognitions, and promotion policies. Promotions must be offered, and the organization must change the employee reward system. [7]

A Study on Safety Management in Fireworks Industry Sivakasi, Virudhunagar District Strong management, dedication, and worker consultation are necessary in the endeavor to establish and maintain a safe and healthy workplace in order to produce a solid health and safety program. The investigations show that human error is a major factor in fire accidents, and efficient safety management, along with worker training and education, can significantly reduce accidents. Accidents would be significantly reduced by dividing up measures like automatic chemical handling systems. Above all, top management support for accident prevention is crucial. [8]

5. Data analysis

Figure 1 gives a basic outline as to the various categories of people working in the Sivakasi Firework Factories. It gives an idea that majority are in the age group 36-50 years. It is identified from this age group that people of the age group need social security measures and other benefits for them as well as for their family.



Figure 1 – Showing the Age- wise classification of workers working the Sivakasi Firework Factories

The majority of the workers in the Firework Factories is women. Figure 2 gives an idea about the more women population comparing to the men in the Factory. During the interview it is noted that many women is working in the factory for more than 10 years.

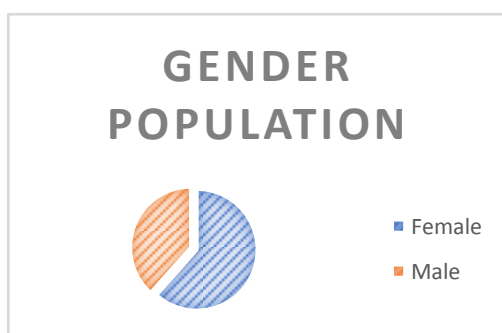


Figure 2: Showing the major population are women in the Sivakasi Firework Industries.

Wages are considered as the major force behind people working in a particular Industry. In Sivakasi the livelihood of many are this Firework Factories. Devoid of the health-related problems which may arise from the work they are very sincere in their work. Table 2 shows the difference is the salary which the workers receive during seasonal and Non -seasonal time.

Table 2 Showing the Salary per week of the Sivakasi workers during Seasonal time and Non – seasonal time.

Sl No.	Seasonal/ Non-Seasonal	Average salary	Number of workers out of 206
1.	Salary per week during non-seasonal time	1000-2000	128
		2000-3000	58
		3000-4000	18
		4000-above	2
2.	Salary per week during seasonal time	1000-2000	122
		2000-3000	59
		3000-4000	22
		4000-above	3

Source: Data collected from the Questionnaire by the researcher.

It is pertinent to note that there were sufficient safety provisions given by the employer in the Firecracker manufacturing unit. No employee complained about the absence of safety equipment, nor women and children working in the chemical unit. The employers were sufficiently following the all the safety provisions for the protection of the workers. Even night shift was not given to them. The only problem arises when the ban was imposed on the firecrackers. Table 3 shows the problems faced by workers when ban was imposed on the workers.

Table 3 Showing the Changes happened after the Supreme Court Judgment on partial Ban of Firecrackers

Sl. No.	Changes during the partial ban of firecrackers after the Supreme Court Judgment	No of workers out of 206
1.	Reduction in wages	Yes-50 No-156
2.	Loss of employment	Yes- 40 No-166
3.	No Guarantee for Job	Yes- 200 No-6
4.	Government Aid or Help schemes	Yes-0 No-206
5.	Any help provided from the side of the employer	Yes-158 No-48
6.	Do you think that the Supreme Court Judgment is good and	Yes-158

	appropriate	No-48
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Source- Based on the data collected by Interview method

5.1 Data given by the Workers during Interview

The workers reported to the researcher during an interview about their degree of satisfaction, saying that they receive enough safety-related measures but that their pay is insufficient and they are unable to make ends meet. When questioning employees over the age of 55, they stated that due to their age, they are unable to work as efficiently and quickly as younger workers, and as a result, their productivity level is quite low. In workplaces where employees are paid weekly based on their productivity level, elderly workers are paid very little. The workers suggest that the factory owners evaluate these factors and make appropriate improvements. The workers suggest that it is necessary to enhance the welfare measures. Tamil Nadu Fire and Match Workers' Welfare Board is situated in Virudhunagar District and few workers have registered, but they have derived any benefit from the same.

Only a small percentage of workers believe they consistently experience health-related issues such as physical and mental stress, extreme work capacity due to pressure at work, family strain, etc. There is a lack of awareness of the hazards that they are working with because the majority of employees are at the primary level. Older workers make insufficient money. Most responders receive their pay on a weekly basis. The majority of workers are content with their pay, and they earn adequate bonus amounts. The employees who are under 50 years old believe that their employment raises their standard of living and income. The vast majority of respondents thought the safety precautions were sufficient. The majority of workers in the study unit are content with their working environment, welfare services, safety precautions, and labor relations. The Supreme Court Judgement has actually created a fear in the minds of the people. Even though no drastic changes happened to their safety provisions or wages, the workers do expect a change in the near future.

6. Suggestions and Recommendations

The researchers have provided the following recommendations for the improvement of workers in the fireworks industry based on a thorough investigation of the industry's personnel:

- For older workers specifically, the pay may be increased to help them raise their standard of living.
- Since there are unpredictable explosions in the fireworks industry, there are a few precautions that may be taken in addition to health risks, such as warning sirens, employee training, and supplying extra gloves, masks, goggles, and aprons.
- Employers might provide recreational amenities like radios and tape recorders in the office to break up the monotony.
- For any urgent need or wedding event, the sector can also arrange loan facilities.
- For the workers in the fireworks sector, the government may introduce additional subsidies, rewards, and relaxations.
- Make sure the staff doesn't drink alcohol when handling fireworks. Make sure an adult is in charge of supervising all activities involving fireworks.
- For the workers in the fireworks sector, the government may introduce additional subsidies, rewards, and relaxations.
- Given that the majority of employee's lack literacy, it may be argued that providing workers with the necessary safety training on safe work practices and chemical risks will raise awareness among them.
- The supervisors and employees should be able to contact management with ease in the event of an emergency. There should be goodwill between management and employees.

➤ They can be given appropriate social security schemes from the Tamil Nadu Board constituted for this purpose. The state Government initiative is very much necessary at this context.

➤ The Supreme Court Judgment on ban of old crackers and bringing of Green Crackers will definitely change the lives of thousands of people who have their livelihood in this sector.

7. Conclusion

The study makes it abundantly evident that a variety of factors, including an increase in revenue, bonuses, suitable working hours, the installation of safety measures, health measures, and welfare measures, affect the quality, efficiency, and living standards of the fireworks sector in Sivakasi. Employers in the fireworks industry can increase employee working efficiency by considering the researcher's above recommendations, which will raise their level of productivity and enable the sector to become profitable. Motivation of the employee is necessary at every angle being the wages or social security benefits. Labour Force is the back bone of a country and protection of them is the duty of the state. It is time to protect the firework industry workers by giving them proper skill and development for molding them for other appropriate jobs.

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