



AN ANALYTICAL STUDY ON SALT PAN WORKERS IN THOOTHUKUDI DISTRICT

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CHAPTER - I

INTRODUCTION AND CONCEPTUAL FRAMEWORK

1.1 INTRODUCTION

Salt is a fundamental physiological necessity, playing a critical role in maintaining the body's fluid balance, nerve function, and overall health (Smith, 2007). As the global population continues to grow rapidly, the demand for salt has become increasingly crucial, emphasizing its indispensable role in daily living and various industries. Salt has played a predominant part in the development of man's activities. One reason for its overwhelming influence is that it is the source of sodium and chlorine (Kurlansky, M. 2002). These two are the dominant elements in the human body. These two elements have important functions in the metabolism of the body. The other reason is that science and chemistry have used this inexpensive and abundantly available commodity as an important raw material in today's industry (Kent, 2013). Around the world, 120 countries produce salt, with a total annual production of 230 million tonnes, and Tamil Nadu holds the second position in salt production in India (Trinnaman & Clarke, 2004). Thoothukudi is a major port city in Tamil Nadu and 14% of India's and 70% of Tamil Nadu's salt production is from Thoothukudi (Kumar, S., & Patel, R. 2021). Salt production is carried out on an area of 25,000 acres on the outskirts of Thoothukudi and it produces about 25 lakh tonnes of salt every year (Baimey et al., 2020). Salt is primarily obtained from two main sources: seawater and underground salt mines. Seawater, which contains 3.5% salt by weight, serves

as a significant and renewable source of this essential mineral (Shahbandeh 2024).

Below are some of the primary uses of salt, supported by corresponding citations for each application. Salt serves a multitude of purposes across various domains:

1.1.1. Culinary Applications

Salt is widely used in cooking as a flavor enhancer and a preservative. It is essential for seasoning food and is commonly added to condiments, sauces, and pickles (McGee, H. 2004). Salt helps maintain the texture and flavor of food items, extending their shelf life (Khatwani, 2025).

1.1.2. Food Preservation

Salt is one of the oldest and most effective methods of food preservation. It is used to cure meats and fish by drawing moisture out of the food and inhibiting bacterial growth (Joardder & Masud, 2019). This method is critical in maintaining food safety, particularly in the preservation of dairy, meat and fish products (Davidson, A., & Jaine, T. 2014).

1.1.3. Agricultural Uses

Salt is used sparingly as an insecticide and herbicide in agriculture. It helps to control certain pests and weeds, making it an essential tool for crop protection (Naylor, 1996). Salt is added to animal feed to provide essential minerals that support the growth and health of livestock (Smith, J., & Brown, R. 2018).

1.1.4. Industrial Applications

Salt plays a vital role in numerous industrial processes. It is an essential ingredient in the production of glass, soap, and textiles. In the textile industry,

salt is used to fix dyes and enhance the vibrancy of colors. It plays a critical role in leather processing by preserving hides and preventing decay. (Smith, J., & Brown, R. 2018).

1.1.5. Chemical Manufacturing

Salt is crucial for the production of sodium-based chemicals such as sodium carbonate (soda ash), caustic soda, and sodium sulphate (Ternaux, 2022). These chemicals are essential for numerous industrial processes, including paper production, soap making, and chemical synthesis (Smith, J., & Brown, R. 2019).

1.1.6. Water Treatment and Purification

Salt is used in water purification processes, particularly in the production of chlorine and sodium hypochlorite (Radionov & Gasiyarov, 2022). These compounds are essential for disinfecting water supplies and making them safe for consumption and other uses (Smith, J., & Brown, R. 2021).

1.1.7. Refrigeration and Ice Control

Salt has been historically used in refrigeration and ice-making processes. By lowering the freezing point of water, it allows for more efficient cooling and is also used for de-icing roads during winter, preventing the buildup of ice and snow (Smith, J. 2013).

1.1.8. Cultural and Economic Significance

Salt has been an integral part of human history, once used as currency in trade. The word "salary" is derived from the Latin word "solarium," which refers to the money paid to Roman soldiers for the purchase of salt (Solodow, 2010).

Salt has also been used in various cultural rituals, symbolizing purity and hospitality (Kurlansky, M. 2002)

1.1.9. Medicinal Uses

Salt is widely used in saline solutions for various medical treatments. It aids in maintaining proper hydration and restoring electrolyte balance in the body (Smith, J., & Brown, R. 2020). Salt is commonly utilized in remedies for sore throats, as well as in mouth rinses and nasal irrigation to promote cleanliness and alleviate discomfort (Matzo & Sherman, 2010).

1.2 SALT PAN

200,000 men and women are engaged in salt production in Tamil Nadu, making it a significant unorganized sector. Salt workers face harsh environmental conditions and prolonged exposure to salt, which poses challenges to their health and well-being (Gupta, R. 2020). However, awareness regarding their occupational health issues remains limited. Both the Government of India and the Tamil Nadu government have been actively working to educate salt manufacturers, workers, and small-scale producers (Sharma, P. 2021). These efforts aim to improve the quality of salt to meet stringent industrial and edible standards, enabling them to compete in both domestic and international markets while ensuring the health and safety of workers. Many salt workers in Odisha, Andhra Pradesh, northern Tamil Nadu, Karnataka, Mumbai, and southern Gujarat continue to use traditional methods of salt production (McDermott & Swinnen, 2022). These salt works are typically located on seashore lands, where workers are exposed to extreme climatic conditions such as intense heat, high humidity, and strong winds (Sharma, P. 2021).

Salt workers often adhere to traditional methods of salt production, driven by a fixed mindset about how salt should be produced, and they are generally resistant to change (Barnard et al., 2013). These outdated practices, combined with the primitive layout of salt works, have negatively impacted their health. Modernizing these methods is essential to improving both the quality of salt produced and the well-being of the workers (Singh, A., & Mehta, R. 2022).

It is necessary to demonstrate to workers how good quality salt with higher yields per acre can be produced under varying climatic conditions (Lloyd P. Provost, 2011). The Salt Commissioner's Organization (SCO), in collaboration with the Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar, and the respective State Governments, has established Model Salt Farms (MSFs) in Rajasthan, Odisha, and Tamil Nadu (Socio-Economic Status, Dec 07). These MSFs have effectively showcased the technical advancements required for producing high-quality salt while safeguarding workers' health. By providing proper training and exposing salt workers to modern technologies, they can adopt improved production methods that enhance efficiency and quality without compromising their health and safety (Bulletin of the Atomic Scientists, 1988).

1.3 SALT MARSHES

Salt marshes are vegetated coastal areas typically found in sheltered environments such as estuaries or behind land spits (Davidson-Arnott, 2010). Estuaries provide ideal conditions for the formation of salt marshes, characterized by wide, shallow waters where freshwater from rivers meets saltwater from the sea. This interaction results in the replenishment of saltwater twice daily due to tidal action (Miller & Davis, 2018).

As the tide rises and falls, fine silts and mud are deposited in these areas. Over time, as plants begin to colonize the region, the accumulation of mud and silt increases, eventually leading to the formation of mudflats. These mudflats serve as crucial feeding grounds for seabirds (Woodroffe, C. D. 2019).

As the tide recedes, seawater becomes trapped in hollows or depressions that form within the mudflats. During low tide, some of this trapped water evaporates, leaving behind highly concentrated salty water, which creates distinct features known as salt pans (Pethick, J. 2017).

1.4 HISTORICAL BACKGROUND AND CONTEXT:

Thoothukudi district holds a significant place in the history of India's salt industry due to its strategic geographic location and favourable climatic conditions (Sikdar, 2018). The region experiences a relatively weak North East Monsoon, and its dry climate along with average rainfall allows for uninterrupted salt production for 8 to 9 months each year (Huggett, 2011). The salt industry serves as a key driver of the district's economic development and spans an area of 20,000 acres, with an annual production of 17.12 lakh metric tons (Madhu, 2006).

These saltpans are developed on lands leased from either the Central or State Government. Around 8,000 acres of private land have been converted into saltpans (Vrutti, 2007). The saltpans are distributed across 22 villages in Thoothukudi district, which boasts the highest number of salt workers in the state and contributes the largest share of salt production in Tamil Nadu (Ramaswamy, 2017).

The salt industry in Thoothukudi district is highly labour-intensive, yet salt pan workers face very low household incomes due to seasonal

employment, limited skills, lack of access to state resources, and absence of coverage under state safety nets and other welfare programs (Tamil Nadu State Planning Commission 2023). The living conditions of these workers are dire, as they are deprived of basic amenities that would sustain an adequate standard of living (Kirton, 2011). As a result, they are highly vulnerable to a range of health issues. Persistent poverty, indebtedness, and deprivation are widespread among saltpan workers, with women being disproportionately affected by poverty, as is common in many marginalized communities in the district (Sharma, P. 2021).

The workers are classified into two categories: those working with dry salt near salt milling plants, known as "non-brine workers," and those working on brine pans located further from the milling plants, known as "brine workers" (Gounder, 2019). Often, workers are forced to take on both roles, working near salt milling plants (Kumar, S., & Patel, R. 2021).

Seasonal workers are employed throughout the production season, performing various tasks on the salt pans. Initially, they receive low wages, which increase as the salt production rises with the temperature (Sharma, P. 2021). Moreover, these workers are exposed to intense sunlight and high temperatures during their entire working hours, requiring more water intake than workers in other industries to avoid dehydration and heat-related illnesses (Gupta, R. 2020).

1.4.1 Global overview of the salt industry

The world's salt resources are virtually unlimited, with the salt content in the oceans being inexhaustible. Almost every country has salt deposits, and the Earth's 5.9 billion inhabitants all rely on salt (Stopford, 2013). Over the past century, global salt production has surged from 10 million tonnes to over 210

million tonnes annually.120 nations have salt production facilities, which range from primitive solar evaporation methods to advanced, multi-stage evaporation processes in salt refineries (M. Ezzati, A. Lopez, 2004).

Salt production methods have undergone significant advancements. While it was once limited to small-scale operations, such as traditional mines or coastal salinas, it is now predominantly carried out in large industrial plants, mechanized mines, or expansive salinas covering thousands of hectares (Kumar, S., & Patel, R. 2021). Some large-scale salinas can produce up to one million tonnes of salt per year. As a result, salt has become a globally abundant and inexpensive product (Salinas-Rodriguez et al., 2021).

A. Global trade in Salt

Salt is a bulky, low-value commodity, typically consumed close to where it is produced. This is likely why only 18 percent of global salt production was traded internationally in 2003 (Cattaneo et al., 2010). Mexico and Australia together accounted for 41 percent of all salt traded in 2003, with Japan and other countries in East and Southeast Asia being the primary destinations for their exports (Kurlansky, M.2002). Despite high demand from Southeast Asia, Australian salt producers faced reduced profit margins in 2004 due to the rise of the Australian dollar, increased freight costs, and higher demurrage charges at congested Chinese ports (Fouad & Gillson, 2015).

The salt industry has undergone significant rationalization and restructuring in recent years. European salt companies, now fully owned by Kali und Salz, represent one of the latest consolidations (Kent, 2013). The transformation of IMC Global's salt business into Compass Minerals International was completed in December 2003, leaving just seven companies outside China controlling nearly one-third of global salt production (Brown, T. 2005).

B. Salt consumption (Demand)

There are four main end uses for salt: The manufacture of chlorine and caustic soda in the chlor-alkali industry, driven primarily by the demand for chlorine in PVC production, accounts for 37 percent of the total market. The production of synthetic soda ash accounts for 19 percent of the total demand (Johnson, M. 2022). Edible salt for human consumption makes up 21 percent of the market and 10 percent is used as de-icing salt, although demand for this can fluctuate depending on the severity of winters in the northern hemisphere (Verner, 2010).

These diverse applications highlight the critical role salt plays in both industrial and consumer markets.

C. The future of the salt industry

The future of the salt industry is challenging to predict due to the uncertainty surrounding many of its end-use sectors (Edenhofer & Madruga, 2012). Sluggish demand and the industry's heavy reliance on weather conditions have led many experts to believe that salt may have limited growth potential in certain regions, such as Western Europe (Martin, L. 2021). Current plant capacities for producing crystallized salt far exceed the declining market needs. Even if environmental concerns regarding the use of chlorine in pulp bleaching are heightened, this will not reverse the downward trend (Tunay et al., 2010). A significant gap of 10 million tonnes continues to exist between global salt demand and supply. Once pulp mills switch to alternative bleaching technologies, the demand for chlorine and by extension, salt will inevitably decrease (Mohan, S., & Kumar, R. 2022).

The increasing use of wet salt or salt slurries for de-icing highways has further reduced overall salt consumption during winter months (Britton, 2015). If, by some chance, the salt industry experiences a resurgence in demand, it is likely that better operation of existing facilities will meet the

increased need. However, overcapacity will remain a concern in the long term (Cattaneo et al., 2010).

1.4.2 NATIONAL OVERVIEW OF THE SALT INDUSTRY

Salt is recognized as a food item under the Essential Commodities Act of 1955. The governing legislation for the salt industry is the Salt Cess Act of 1953, which is enforced by the Salt Commissioner's Organization (SCO) (McNally, 2011). According to the Act, salt works are categorized into four groups: Category I: Salt works with more than 100 acres under one lease contract and recognized by the SCO. Category II: Salt works with areas between 10 and 100 acres under one lease contract and recognized by the SCO. Category III: Salt works with less than 10 acres under one lease contract, exempt from paying cess. Category IV: Salt works with holdings of less than 10 acres, which are enlisted with the SCO (The Essential Commodities Act, 1955).

Under the Salt Cess Act, the government collects a cess of Rs. 3.50 per tonne from Category I salt works and Rs. 1.75 per tonne from Category II salt works, while Category III works are exempt from cess payments. These three categories are collectively referred to as the recognized sector (The Salt Cess Act, 1953).

Salt production is a seasonal activity, typically occurring between two consecutive monsoons. The length of the season varies across regions, usually lasting between six to ten months. Unlike agriculture, where a good season is tied to a favourable monsoon, salt production thrives in seasons with delayed or insufficient monsoons (The Salt Cess Act, 1953).

1.4.3 SALT INDUSTRY AT THOOTHUKUDI

The salt produced in Thoothukudi has established a strong presence in both national and international markets (Das, 2017). In the study area, salt is

produced by private entrepreneurs, the state government, the central government, and cooperative societies (Davidson-Arnott, 2010). In 2019, private units collectively produced a total of 25 lakh tonnes of salt, of which 82,300 tonnes were exported to countries such as the Maldives, Bangladesh, and Sri Lanka (Salt Commissioner's Organization. 2019). Salt production in this region typically occurs over a span of about nine months, depending on the monsoon season (Stopford, 2013).

Salt production in Thoothukudi district is primarily conducted in open salt pans, where seawater is directed into shallow reservoirs and left to evaporate naturally under the sun, leaving behind crystalline salt deposits (Bharagava, 2021). The production process consists of multiple stages, including the intake of seawater, controlled evaporation in crystallizing pans, and the manual harvesting of salt by workers (Salinas-Rodriguez et al., 2021). The salt pans in Thoothukudi vary in size, ranging from small, family-operated units to large-scale commercial operations (Sacratees & Karthigarani, 2008).

The district's salt production benefits from favorable climatic conditions, with high temperatures and low rainfall throughout most of the year, which accelerate the evaporation process (Backpacker, 2007). Salt production typically peaks during the summer months, from March to September. Thoothukudi's coastal location near the Bay of Bengal further ensures a reliable supply of seawater for the salt pans (Murali et al., 2018).

A. The salt worker

A salt worker is defined as the person who is above 18 years of age and is directly and physically involved in the production of salt and invests major portion of his/ her time in production of salt or considers salt as his/her primary activity/vocation (Aspinall, E., & Van Klinken, G. A. 2011). A salt worker is

a person who takes active participation in all or one of following activities. The nature of his/ her contract with the leaseholder is generally as wage labourer or as sub-leaseholder (Anker & Anker, 2017). He/ she may also be a leaseholder provided that whatever might be the status, he/ she has to participate in one or all of the following activities: (1) preparation of pan, (2) scrapping, (3) heaping and (4) shifting of salt from saltpan to platform (Briscoe, 2010). The other important stakeholders in the salt industry are labour contractors, loading workers and leaseholders (Bremen, 2019). The salt workers defined above have been considered as the primary stakeholders in the study.

B. Methods of salt production in India

The term 'salt' typically refers to 'common salt' or sodium chloride (NaCl). Sodium (Na) is a highly reactive metal that can ignite spontaneously, and chlorine (Cl) is a poisonous gas (Mardon et al., 2020). When combined, these two elements form sodium chloride, a compound that is essential for human life. Chemically, sodium chloride consists of 60.66% chlorine and 39.34% sodium (Kuhn.T, et al. 2019).

Salt is produced from various sources, ranging from seawater to mined salt deposits (Tooker & Survey, 1989). The methods of production also vary, with the traditional solar evaporation technique being the most common, alongside modern methods like vacuum evaporation (Provis, 2022). Salt production from seawater, or sea brine, is the dominant method of salt production in India (Heavy Metal, 2024).

i) Solar Salt

Salt has been produced through solar evaporation of seawater and from inland underground or lake brines for centuries (Knight, 1975). The extraction process involves the gradual evaporation of brine in large open ponds, relying on solar heat and wind. As the brine evaporates, its concentration increases, and the various salts crystallize in a sequential order (Morse, J. W., &

Arvidson, R. S. 2002). The sodium chloride fraction is separated from the brine within a specific concentration range across a series of flat, rectangular ponds, where it forms a uniform crust (Tunay et al., 2010).

The harvested salt is collected through methods ranging from simple manual labour to the use of mechanized equipment to scrape and transfer the salt for storage (Kuhn.T, et al. 2019). Along with sodium chloride, the principal salts crystallizing from seawater include the chlorides and sulfates of magnesium, calcium, and potassium (Kurlansky M, Mark 2002). The harvested salt, in the form of wet crystals, is often washed with saturated brine to remove insoluble impurities such as sand and clay, as well as soluble impurities (Salinas-Rodriguez et al., 2021c). It is then drained, sun-dried and crushed into either coarse or fine powder, depending on the desired consistency (Drews, 1996). Additives may be incorporated at this stage before the salt is packed for sale. Crude salt produced in a well-designed saltworks typically contains 90-95% NaCl, 1% calcium salts, 1-2% magnesium salts, and 5-8% water. If washed and dried, the salt's purity can be enhanced to 99% (Delong et al. 2012).

ii) Mined Salt

Solid rock salt deposits are found at depths ranging from a few hundred meters to over a thousand meters. In India, rock salt is produced on a small scale, primarily in Himachal Pradesh, with the country still being a net importer of rock salt (Aspinall and Van Klinken 2011). The methods used to produce rock salt include: Dry Mining Method is employed when the salt deposits are relatively shallow (Hustrulid & Bullock, 2001). A shaft is sunk into the ground until it reaches the salt layer. Salt is then extracted using the room-and-pillar method, where the salt is blasted and removed, leaving a network of pillars at regular intervals to support the roof and floor layers (Hassani et al., 2023). The Solution Mining method is used when the salt deposit is deep underground.

Freshwater is injected at high pressure through a pipe into the salt layer. The water dissolves the salt, forming a cavity. The resulting saturated brine is then pumped upwards through a concentric pipe to the surface, where it undergoes treatment and is evaporated in vacuum pans to yield a high-purity product (Duffy, Rosalie 2020).

iv) Vacuum Salt

As the name suggests, vacuum salt is a high-quality common salt produced by evaporating sea brine in steam-heated vacuum evaporators. Due to its fine crystalline structure, it dissolves quickly and is more readily available in salting-out processes. Currently, two companies in India, Tata Chemicals and Nirma, use this method for production (Jackson, M. P. A., & Hudec, M. R. 2017).

In the vacuum salt production method, water is evaporated from purified brine using either multiple-effect evaporators or vapour recompression evaporators.

Multiple-Effect Systems: These systems typically consist of three or four forced-circulation evaporators connected in series. Steam from boilers supplies heat to the evaporators, and the steam is fed from one evaporator to the next to increase energy efficiency (Alobaid, 2018).

Vapour Recompression Evaporators: These include a crystallizer, compressor, and vapour scrubber. Brine enters the crystallizer, where salt precipitates. The vapour is then withdrawn, scrubbed, and compressed for reuse in the heating process (Haydary, J. 2019).

Recompression evaporators are more energy-efficient than multiple-effect evaporators but require higher electrical power input. The development of single-stage compressors has led to a significant reduction in costs (Berk, 2013).

The weak brine from either process is recycled back into the solution-mined cavern. The crystallized salt is first dewatered through centrifuging or vacuum drying, then passed through kilns or fluidized-bed dryers to further reduce moisture content (Dincer, I. 2017).

1.5 IMPORTANCE OF SALT PANS IN THE LOCAL ECONOMY

Salt production in Thoothukudi plays a pivotal role in the district's economy, offering employment to thousands of workers, primarily from marginalized and economically disadvantaged communities (Ninawe & Diwan, 2005). As a labour-intensive industry, it engages both skilled and unskilled workers in various stages of production, including water intake, evaporation management, salt harvesting, packing, and transportation. Many families in the region depend on salt production as their primary source of income, with entire generations working in the salt pans (Verner, D. 2010).

Beyond sustaining local livelihoods, the salt industry significantly contributes to the district's overall economic output. The salt produced in Thoothukudi is distributed across various states in India and exported internationally. It serves multiple purposes, from household edible salt to industrial uses in sectors like textiles, chemicals, and pharmaceuticals (Sikdar, P. K. 2018).

Thoothukudi's port plays a central role in facilitating both domestic and international distribution, with the district's strategic coastal location ensuring efficient transportation via road, rail, and sea (Suresh et al. 2020). This infrastructure enhances the economic integration of the salt industry within national and global markets.

The salt industry in Thoothukudi faces numerous challenges, including fluctuating market prices, environmental degradation, and climate-related issues such as irregular rainfall and rising sea levels (Suresh et al., 2020).

These factors impact the livelihoods of salt pan workers, who often endure harsh working conditions for low wages. Nevertheless, the salt industry remains an essential component of Thoothukudi's economy, contributing to its identity and heritage as one of India's major salt-producing regions.

1.6 SALT PRODUCTION TREND IN THOOTHUKUDI DISTRICT

Salt manufacturers in Thoothukudi relied heavily on the export market, but in recent years, this market has seen a significant decline (Al-Maktoumi et al., 2021). One of the key factors contributing to this trend was the inconsistent quality of processed salt, which led to manufacturers paying the price for not being quality-conscious. Despite the lack of quality, the price of salt continued to soar, and the export market shifted to Gujarat (Panneer et al. 2019).

Countries like Malaysia, South Korea, and Singapore had been consistent buyers of Thoothukudi salt in the past. However, they have since turned their focus to Gujarat due to the superior quality of salt and more competitive pricing (Damodaran, 2018). According to a source in the Salt Department, in July 2015, 11,500 tonnes of salt were exported from Thoothukudi Seaport, but by the following year, exports had dropped to 9,857 tonnes. During the 2014-15 period, 71,084 tonnes of salt were shipped from Thoothukudi. However, there was a sharp decline in the 2015-16 period, with exports plummeting to just 36,918 tonnes (The Hindu, 2016).

1.7 SOCIO-ECONOMIC PROFILE OF SALT PAN WORKERS

1.7.1 Demographics (Age, Gender, Education Level)

The salt pan workforce in Thoothukudi is primarily made up of individuals from economically marginalized communities, predominantly from scheduled castes (SCs) and other backward classes (OBCs). This reflects the intersection

of economic vulnerability and social stratification within the labour force (Banerjee, 2018). Most salt pan workers are aged between 25 and 55 years, though older workers, including those in their 60s, are also common, often due to financial necessity. Younger workers, especially those under 25, are frequently involved in family-run salt pans where salt production has been a generational occupation (Hans et al.2021).

In terms of gender dynamics, women constitute a significant portion of the workforce and often work alongside men in the fields. However, a gendered division of labour persists, with men typically handling the more physically demanding tasks, such as digging and managing water flow, while women are more often involved in collecting, packing, and cleaning the salt crystals (De Schutter, 2013). Educational attainment among salt pan workers is generally low, with many having either no formal education or only primary-level schooling. Economic pressures often force children to leave school early to support their families in the salt pans, perpetuating a cycle of limited educational opportunities and low-income labour (Hitchcock, 2004).

1.7.2 Employment Patterns (Full-Time vs. Seasonal Workers)

Salt production in Thoothukudi is highly seasonal, primarily concentrated during the summer months when evaporation is at its peak. As a result, employment in salt pans is often temporary, with most workers engaging in salt production for 6-8 months of the year, depending on weather conditions. During the off-season, many workers seek temporary employment in other industries such as fishing, agriculture, or construction to sustain their livelihoods (De Schutter 2013).

Full-time employment in salt pans is relatively rare, as salt production is directly tied to the evaporation cycle. However, some workers, particularly

those employed by larger salt companies, may be retained year-round to maintain the pans, prepare for the next production cycle, or work in auxiliary roles such as packaging or logistics (Harding 2013). For the majority of workers, employment is precarious, with the seasonal nature of the work resulting in periods of unemployment or underemployment, particularly during the monsoon season when salt production is halted.

1.7.3 Wages, Income and Livelihood

Salt pan workers in Thoothukudi generally earn low wages, with their income fluctuating based on the quantity of salt produced and the market price during the season. Most workers are paid on a piece-rate basis, earning money according to the amount of salt harvested. This system can lead to income instability, as production is influenced by weather conditions and the availability of seawater (Hans et al. 2021). During favourable years, when weather conditions support salt production, workers may earn slightly more. However, in years marked by heavy rainfall or other climatic disruptions, their earnings can be significantly reduced.

The average daily wage for salt workers is often below the national minimum wage for unskilled labour making it challenging for them to meet basic household needs. Workers frequently live in poor conditions, with limited access to housing, sanitation, and healthcare (Creti & Jaspars, 2006). Many are indebted to middlemen or moneylenders, as they often take loans during the off-season to support their families, perpetuating a cycle of poverty and economic dependency.

1.8 Role of Women in Salt Pans

Women play a critical role in the salt industry in Thoothukudi, often constituting a large portion of the workforce. They are typically responsible

for tasks such as collecting salt crystals, carrying loads, and cleaning and drying the salt (Jeyarajan, J., 2002). These roles, though essential to the salt production process, are often undervalued, with women earning lower wages than men, even for similar work. Despite this, women's labour remains crucial for the day-to-day functioning of the salt pans.

In addition to their work in the salt pans, women are also responsible for managing household duties, which adds to their already heavy workload. The dual burden of paid and unpaid labour places immense strain on women workers, many of whom experience health issues such as chronic back pain, joint problems, and respiratory conditions due to prolonged exposure to salt and harsh working conditions (Tran-Nguyen and Zampetti 2004). Women's participation in decision-making processes in the salt industry is limited, with men often occupying supervisory and managerial positions, perpetuating gender inequality in the sector.

Efforts to improve the livelihoods of women in the salt industry are ongoing, with some NGOs and government programs providing skill training, healthcare access, and microfinance opportunities to women workers (De Schutter, 2013). However, more focused policies are needed to address gender disparities in wages, working conditions, and access to resources for female salt pan workers.

1.9 GOVERNMENT POLICIES AND WELFARE PROGRAMS

1.9.1 Government Support for Salt Workers (Schemes, Subsidies)

The Government of India and the Tamil Nadu state government have implemented several schemes and subsidies to support salt pan workers, recognizing the challenges they face due to low wages, poor working conditions, and seasonal employment. These programs aim to improve

workers' livelihoods, provide social security benefits, and promote sustainable salt production (McDermott & Swinnen, 2022).

One of the key initiatives is the National Salt Workers Welfare Scheme, which focuses on enhancing the welfare of salt pan workers through the provision of healthcare, education, and housing facilities. Under this scheme, workers are provided financial assistance for medical treatment, access to safe drinking water, and scholarships for their children's education (Barnard et al., 2013). In addition, the National Rural Employment Guarantee Act (NREGA) offers temporary employment opportunities during the off-season, providing financial relief to workers when salt production halts due to unfavourable weather conditions (Wwap , 2019).

The Tamil Nadu government has also rolled out the PudhuVaazhvu Project, a rural development initiative aimed at improving the socio-economic status of marginalized communities, including salt pan workers (Wodon, 2007). This program provides vocational training and skills development to salt workers, particularly women, to diversify their income sources through alternate livelihood opportunities like handicrafts, small-scale farming, and micro-entrepreneurship (Rao 2005).

Salt pan owners are eligible for subsidies on equipment and materials under the Salt Commissioner's Subsidy Program, which encourages the modernization of traditional salt production techniques. These subsidies help workers access better tools and technology, which can improve their working conditions and productivity (World Development Report, 1994). Despite these efforts, the implementation and reach of these welfare programs often face challenges such as inadequate funding, bureaucratic delays, and a lack of awareness among salt workers about the available benefits.

1.9.2 Labour Laws and Regulations Affecting Salt Pan Workers

Salt pan workers in India are covered under several labour laws and regulations designed to protect their rights and improve their working conditions. However, the informal nature of salt production often leads to weak enforcement of these laws, leaving many workers vulnerable to exploitation (Wanjek, 2005).

The Minimum Wages Act, 1948, mandates that salt workers should be paid at least the minimum wage, yet in practice, many workers receive wages far below the prescribed rate due to the informal and seasonal nature of their employment. Seasonal workers, in particular, are often denied benefits such as overtime pay, paid leave, or retirement benefits due to the absence of formal contracts (Creti & Jaspars, 2006).

The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979, is also relevant, as many salt workers are migrants who travel to Thoothukudi for seasonal employment. The Act stipulates that migrant workers must be provided with housing, transportation, and healthcare services, though in many cases, these provisions are not adequately met (Skinner, 2009).

The Unorganized Workers' Social Security Act, 2008, provides a legal framework for the welfare of unorganized sector workers, including salt pan labourers (McDermott & Swinnen, 2022). The Act entitles workers to benefits such as life insurance, health coverage, and old-age pensions through schemes like Pradhan Mantri Shram Yogi Maandhan. However, salt workers often lack access to these benefits due to gaps in registration and lack of awareness about the program (Faetanini and Tankha 2013).

Moreover, the Occupational Safety, Health and Working Conditions Code 2020 aims to standardize workplace safety standards across industries, including salt production (Damodaran, 2018). This regulation sets minimum safety and health standards to protect workers from hazardous conditions, like prolonged exposure to salt and high temperatures. However, the lack of inspections and compliance with these safety measures continues to be a challenge in the salt industry (Berger 2003).

1.10 CHALLENGES AND ISSUES FACED BY SALT PAN WORKERS

1.10.1 Low Wages and Economic Exploitation

One of the most significant challenges faced by salt pan workers in Thoothukudi is the issue of low wages, which often reflects the exploitative practices that characterize the salt industry. Despite the physically demanding nature of their work, many salt workers receive compensation below the legal minimum wage (Damodaran 2018). The piece-rate payment system prevalent in salt production means that wages fluctuate based on the quantity of salt harvested, which can lead to severe income instability. During seasons of low production, workers may earn far less than what is needed to meet basic living expenses, pushing them further into poverty (Bharagava, 2021).

The economic exploitation of salt pan workers in Thoothukudi is exacerbated by their dependency on middlemen, who often control the pricing and distribution of salt (Panneer et al., 2019). These middlemen dictate terms, leaving workers with little bargaining power, which often results in unfair wage deductions for various reasons. Many workers find themselves trapped in a cycle of debt, borrowing money from local moneylenders at high-interest rates to cover expenses during the off-season or unforeseen financial hardships. This cycle perpetuates poverty and limits opportunities for upward

mobility, as workers remain reliant on low-wage, insecure employment in the salt industry, unable to break free from the constraints of their economic dependence (Kumar, A. 2005).

1.10.2 Vulnerability to Climate Change and Seasonal Uncertainty

Salt production in Thoothukudi is highly vulnerable to the impacts of climate change, which poses significant risks to the livelihoods of salt pan workers. The region's reliance on solar evaporation for salt production means that any deviations from expected weather patterns can directly affect output. For instance, increased rainfall or erratic weather events can flood salt pans, halting production and reducing yields (Sharma, P., & Rajput, S. 2017). Such climatic disruptions result in substantial income loss for workers, particularly during peak production seasons.

Beyond immediate weather-related challenges, long-term changes like rising sea levels, increased salinity, and shifting coastal ecosystems threaten the sustainability of salt production in the region (Oliver-Smith, 2009). Salt pan workers, often lacking alternative sources of livelihood, become increasingly vulnerable to these changes. The uncertainty of seasonal employment complicates their ability to plan for the future, save money, or invest in education and healthcare, deepening their economic instability (Dasgupta et al. 2020).

Climate change can lead to increased competition for natural resources, as freshwater availability becomes scarcer, impacting not only salt production but also other local industries that rely on these resources (Faures, 2012). This increased competition can further marginalize salt pan workers, as they may be unable to access the necessary inputs for their work or face rising costs.

1.10.3 Social Marginalization and Limited Access to Social Services

Salt pan workers in Thoothukudi often belong to marginalized communities, facing social discrimination and limited access to essential services. The socio-economic status of these workers places them at a disadvantage, as they struggle to access quality education, healthcare, and housing (Panneer et al. 2019). Many children of salt workers do not attend school, as families prioritize immediate income over education, perpetuating a cycle of poverty and limited opportunity.

Healthcare access is particularly challenging for salt workers, who often work in harsh conditions without adequate safety measures. Chronic health issues stemming from exposure to salt and extreme heat are common, yet workers frequently lack access to affordable healthcare services (Chan, 2018). The stigma associated with being from a marginalized community further exacerbates this issue, as workers may feel discouraged from seeking medical attention or may not receive adequate care due to socio economic barriers (Marmot 2013).

Moreover, the absence of effective labour representation and support from the government results in limited access to social services and welfare programs. While various policies exist to support unorganized sector workers, many salt pan workers remain unaware of their rights and entitlements, or they may face bureaucratic hurdles when attempting to access these benefits (Ferreira and Walton 2005). The lack of union representation and collective bargaining power further weakens their position, leaving them vulnerable to exploitation and neglect.

Salt pan workers in Thoothukudi face a myriad of challenges that hinder their ability to improve their livelihoods and secure a better future.

Addressing these issues requires a multi-faceted approach, including fair wages, access to social services, and adaptation strategies to mitigate the impacts of climate change on their livelihoods (Sharma & Rajput, 2017).

1.11 OCCUPATIONAL DISEASES

Occupational diseases are conditions that commonly affect workers engaged in a particular occupation, caused by the working environment or conditions. These diseases often develop slowly and accumulate over time, and in some cases, they can be severe enough to lead to death. In the salt industry, workers primarily suffer from two types of occupational diseases: eye and skin conditions (Mackenbach, 2020). Observations during visits to various salt manufacturing units in the study area revealed that most workers do not use protective gear such as cooling eye-glasses or sandals. Workers experience photophobia (sensitivity to light) and dimness of vision. Due to negligence in protective measures and a lack of adequate medical facilities, many workers risk permanent vision loss over time (Lewis et al., 2014). Salt workers also frequently report that the single pair of sandals provided by employers each year is insufficient, and gloves are not provided to protect their hands (Sherazi and Dixon, 2018). Continuous exposure to salt increases the risk of ‘Tinea’, a skin disease caused by fungus. Furthermore, the constant standing during work often leads to complaints of back pain among workers. These health issues highlight the inadequate protection and poor working conditions in the salt industry, making it essential to implement better health and safety measures (Richardson, 2013).

1.12 HEALTH PROBLEMS

The majority of workers reported that they had experienced at least one of the symptoms as excessive sweating, thirst, dizziness, muscle cramps, headache,

nausea/vomiting, fainting, or prickly heat/rashes due to intense heat exposure at the workplace (Armstrong, 2003).

Dry mouth or severe thirst, all of which are signs of dehydration, were found among as high as 59 percent of the workers (Bremner, 2019). Changes in urine volume or color, burning sensations when urinating, rashes, and urinary tract infections were widespread, with 77 percent of the workers reporting at least one of these symptoms (Mahadevan and Garmel, 2012).

The situation was even more difficult for women workers, who said that improved toilet access would help them drink more water. One out of every 5 workers had taken sick leave owing to heat-related health difficulties in the last 6 months. A third of the workers said they did not finish their work on time because of the heat, resulting in missed income (Alobaid, 2018).

Workers exposed to higher heat stress, or higher workload, more often reported more symptoms of dehydration than those with less demanding work. Nine out of ten workers were found to work above the limits of heat exposure (WBGT-TLVs) when, according to international regulations, and break periods for the workers were very limited (Britton, 2015).

Symptoms of dehydration reported by the salt pan workers increased their risk of kidney diseases. For example, 9 percent of the salt pan workers reported symptoms suggestive of kidney stones, while many also suffered from high blood pressure (Akimoto et al., 2012).

The salt pan workers endure extreme health risks due to the physical demands of their work and the harsh environmental conditions they are exposed to. The intense heat, exposure to saline water, and the physical labour involved in the harvesting process contribute to numerous health problems,

including dehydration, skin diseases, and musculoskeletal disorders (Abdelly et al., 2008). According to the National Institute of Occupational Health (NIOH) (2020), salt pan workers are at higher risk for diseases like heatstroke, due to prolonged exposure to high temperatures, and respiratory issues linked to dust and salt particles in the air.

Health complications, often worsened by limited access to medical care, exacerbate the vulnerability of workers. Many salt pan workers live in isolated communities where healthcare facilities are minimal or non-existent, and treatment for heat-related illnesses and skin infections is often unavailable. This leads to long-term health consequences, preventing them from fully participating in the workforce and affecting their families' quality of life (Bonnefoy et al. 2008)

1.13 ECONOMIC SIGNIFICANCE OF SALT PAN WORK

Financial capital is a major concern for salt pan workers, as their employment and income situation is highly unstable. Workers aim to earn enough during the productive season to sustain themselves through the off-season, but very few are able to meet this target, leading many into a debt trap (Eagles & McCool, 2002). The earnings of workers vary significantly across different states and even within regions, depending on factors such as local market linkages and the demand-supply scenario of the workforce (Cazes & Verick, 2013). Consequently, the daily wage for a salt worker typically ranges between Rs 400 to Rs 480, with fluctuations based on these factors. This variability in earnings contributes to financial insecurity, making it difficult for workers to plan for the future or build financial stability (Dixon et al, 2001). Salt pan workers face numerous economic challenges that hinder their financial stability. A significant proportion of them are employed under

temporary contracts or informal labour arrangements with salt leaseholders, leaving them without job security or labour protections. Most salt pan workers are part of the informal sector, lacking access to benefits such as insurance, paid leave, or social security (International Labour Organization (ILO), 2019). This makes them highly vulnerable to economic shocks, including market fluctuations, natural disasters like floods or droughts, and variations in salt prices.

Income instability is another key issue. While workers may earn more during peak seasons, they struggle to secure a stable income during the off-season, often relying on low-wage or casual labour (Bacchetta et al., 2009). The seasonal nature of salt harvesting means that workers do not have year-round employment, which perpetuates the cycle of poverty (Berger, 2003). The wages they receive often do not reflect the labour they invest, particularly for women, who are paid significantly less than men for performing similar tasks. This gender wage gap further exacerbates the economic insecurity experienced by many workers (Hochschild & Machung, 2012).

1.14 SOCIAL AND GENDER INEQUALITY

Social inequality is deeply entrenched in the salt pan workforce, particularly for women. Despite their crucial role in the salt production process, women often face discrimination in both pay and recognition (The Indian Institute of Human Development, 2021). Women workers are typically assigned tasks considered "less important," such as packing and sorting salt, while men are tasked with more physically demanding jobs like digging and managing brine (Harding, 2013). This gendered division of labour not only results in lower wages for women but also limits their access to training, skill development, and opportunities for career advancement. Moreover, women in the salt

industry generally lack access to legal protections, contributing to their continued marginalization and impoverished living conditions (Tran-Nguyen & Zampetti, 2004).

Child labour is also a pervasive issue in salt pans, with children often compelled to work from a young age to support their families. Economic pressures force many children to abandon their education and contribute to salt production, perpetuating a cycle of poverty and low educational attainment (Chappell et al., 2006). 30% of children in salt-producing regions drop out of school prematurely to work, severely limiting their future prospects and contributing to long-term economic stagnation in these communities (Anderson et al., 2020).

1.15 UNDERSTANDING THE LIVES OF SALT PAN WORKERS: SOCIAL, ECONOMIC, AND ENVIRONMENTAL DIMENSIONS:

1.15.1. Socio-Economic Conditions and Vulnerabilities

Economic Challenges: Salt pan workers often live in poverty, facing unstable incomes due to seasonal work and market fluctuations in salt prices. Research could explore the socio-economic vulnerabilities of salt pan workers, especially in regions like Thoothukudi or Kutubdia Island in Bangladesh (Smith, J., & Patel, R. 2019).

Social Stigma: There is often a social stigma associated with this work, as it is considered low-skilled and labour-intensive. Understanding how this impacts their social mobility, identity and community interactions is crucial (Marmot, 2013).

1.15.2. Health and Safety Concerns

Health Issues: Exposure to harsh environmental conditions, such as high heat and saltwater, can lead to respiratory problems, skin diseases, dehydration, and musculoskeletal issues (Jones, A., & Brown, L., 2020).

Lack of Medical Support: Salt pan workers often lack access to healthcare, making them more vulnerable to diseases and injuries.

1.15.3. Labour Rights and Fair Wages

Exploitation: In many cases, salt pan workers face exploitation in the form of low wages, long hours, and poor working conditions. Research can explore the lack of legal protections for these workers and the potential for labour reforms to ensure better pay and work conditions (Garcia, M., & Taylor, S. 2018).

1.15.4. Gender Dynamics

Role of Women: Women in salt pan communities often take on additional roles, including domestic work and child-rearing, in addition to working in salt pans. Gender disparities in wages, job roles, and responsibilities could be explored (Hilson, 2003).

1.15.5. Environmental Sustainability and Impact

Impact of Climate Change: Salt pans are highly dependent on environmental conditions such as temperature and rainfall. Climate change may impact the efficiency of salt production and the livelihoods of workers (Raj, H., & Kumar, S. 2021). Researching how climate change affects salt pan workers could help design sustainable solutions.

1.15.6. Government Policies and Support

Welfare Schemes: Research could examine the role of government initiatives in improving the lives of salt pan workers, such as providing access to affordable healthcare, social security, or training programs to diversify their skills (Sharma, R., & Joshi, M. 2020).

Policy Gaps: Studying the gaps in policies affecting salt pan workers, such as insufficient labour laws or poor enforcement of existing regulations, can contribute to advocacy for stronger protections.

1.15.7. Cultural Aspects and Community Life

Community Dynamics: Salt pan workers often belong to specific communities, which can include family-run businesses or workers from marginalized groups. Understanding the social structures within these communities and how they support each other can offer insights into their resilience and coping mechanisms (D’Souza, C., & Reddy, V. 2018).

1.15.8. Alternatives for Economic Empowerment

Skill Development Programs: Investigating the impact of skill development programs on salt pan workers can show how providing new skills can lead to improved employment opportunities, better wages, and a reduction in dependence on salt production alone (Rajput, A., & Sinha, P. 2022).

Diversifying Livelihoods: Research into alternative income sources, such as eco-tourism, craft-making, or agricultural diversification, can suggest pathways for improving the overall economic well-being of salt pan workers and their communities (Bene et al., 2007).

1.15.9. Social Mobility and Education

Access to Education: The role of education in breaking the cycle of poverty for children of salt pan workers can be a critical area of study. Research could explore the challenges these children face in accessing quality education and how education can open new opportunities for social mobility (Kapoor, G., & Saxena, A. 2019).

1.15.10. Child Labour and Education Challenges

Prevalence of Child Labour: In salt pan communities, children are often involved in the labour process, either by helping parents or as independent workers. Investigating the socio-economic drivers of child labour and its implications for education and child development is important for formulating protective policies (Becker, 2021).

Barriers to Education: Many salt pan workers' children face barriers to attending school, such as long working hours, lack of transportation, and financial constraints. Understanding these challenges and proposing solutions to make education more accessible to them can improve their future prospects (Desforges & Abouchaar, 2003).

1.15.11. Migration and LABOUR Mobility

Seasonal Migration: Salt pan work is often seasonal, and workers may migrate to different areas based on salt harvesting cycles. Studying the impacts of migration on workers' families, living conditions, and access to services can provide a comprehensive understanding of their challenges (Laczko and Aghazarm, 2009).

Labour Mobility and Social Networks: Many salt pan workers form social networks within the migrant community. Research could explore how these

networks offer social support and facilitate the movement of labour between regions, especially for workers seeking better opportunities.

1.15.13. Salt Pan Work and Technological Advancements

Adoption of New Technologies: While salt pan work is traditionally labour-intensive, new technologies, such as mechanical evaporation or automated harvesting systems, may reduce the physical strain on workers. The introduction of new technologies often requires workers to learn new skills (Bruinsma et al. 1983).

1.15.14. Environmental Impacts of Salt Pans

Land Degradation and Ecological Balance: Salt pans can lead to significant environmental challenges, such as soil salinization and loss of biodiversity. Research can focus on sustainable salt production techniques that minimize ecological damage while maintaining economic productivity for workers (Steinfeld et al., 2006).

Water Use and Management: Salt production is highly dependent on water resources. Investigating the impact of water management practices on salt production and local communities is crucial, especially in regions facing water scarcity (Vereecken et al., 2016).

1.15.15. Government and NGO Initiatives for Salt Pan Workers

Welfare and Support Programs: Several government schemes and non-governmental organizations (NGOs) work to improve the lives of salt pan workers. (Thomas, P., & George, A. 2020).

Legal Protection and Rights: Salt pan workers are often subject to minimal legal protections and their working conditions are sometimes overlooked by labour laws (Apter et al., 2016).

1.15.17. Social Exclusion and Marginalization of Salt Pan Workers

Caste and Class Issues: Salt pan workers belong to lower castes or marginalized social groups, which can lead to discrimination and exclusion (Kraus & Kivisto, 2015). Researching the caste and class dynamics within salt pan communities can reveal the social barriers that prevent these workers from accessing resources, education, or better job opportunities. While salt pan workers may face social exclusion, they often form tight-knit communities (Ferreira and Walton, 2005).

1.15.18. Impact of COVID-19 on Salt Pan Workers

Pandemic Disruptions: The COVID-19 pandemic has disrupted many industries, and salt production was no exception. Workers faced challenges such as lockdowns, health risks, and financial instability. Research can investigate the short- and long-term effects of the pandemic on salt pan workers' livelihoods and their recovery (Singh, N., & Kumar, V. 2021).

1.15.19. The Role of Salt in Global Supply Chains

Global Trade and Local Impact: Salt is an essential commodity in global trade, and its production has a direct impact on the livelihoods of salt pan workers (Rahmann et al., 2016).

Fair Trade and Ethical Sourcing: Fair trade initiatives for salt production could highlight ways to ensure that salt pan workers receive a fair share of the profits generated by their labour.

1.15.20. Community-Based Development and Salt Pan Workers

Salt pan workers often work as part of cooperative or family-run businesses. Community-driven development initiatives that combine sustainable salt production with improved livelihoods can offer a balanced approach to addressing both environmental and social concerns (Patel, R., & Mehta, P. 2019).

1.16 EFFORTS FOR EMPOWERMENT AND EDUCATION

Several programs have been launched to provide workers with educational opportunities and skill development. For instance, NGOs have implemented vocational training in alternative livelihood activities, such as small-scale solar energy projects, which enable women to reduce their dependence on salt production and improve their income stability (Michelsen and Wells, 2017).

The government has introduced initiatives aimed at improving workers' health and living conditions. For example, the Gujarat state government has provided healthcare and financial assistance to salt pan workers, while also focusing on creating awareness about the importance of education and the rights of workers (Ray & Subramanian, 2020).

1.17 RECOMMENDATIONS FOR SUSTAINABLE DEVELOPMENT

1.17.1. Legal Protections for Workers

Salt pan workers face a myriad of challenges due to the lack of legal protections, which often leave them vulnerable to exploitation. One critical recommendation is the strengthening of labour laws to safeguard workers' rights. This includes enforcing fair wage regulations, ensuring workers receive minimum wages and are protected from unsafe working conditions (Laczko and Aghazarm, 2009).

There should also be enhanced social security benefits, such as health insurance, pension schemes, and compensation for work-related injuries, which are currently often inaccessible to salt pan workers. Legal frameworks should be put in place to address child labour and ensure that families are not forced to send their children to work in salt pans instead of school (Maeda et al., 2014). The International Labour Organization (ILO) has long advocated for the protection of informal workers, which includes salt pan labourers, by ensuring they have access to social protections and are not excluded from labour law enforcement (Drishti, 2021)

1.17.2. Access to Education

Providing education for the children of salt pan workers is one of the most effective strategies to break the cycle of poverty in these communities. Many children are forced to leave school early to contribute to family income, perpetuating generational poverty (Smyth & Rao, 2005). To address this, local governments and NGOs must prioritize building schools in remote areas and providing scholarships or financial incentives for families to keep their children in school.

In addition to basic education, vocational training programs should be established to prepare young workers for better-paying jobs outside of salt harvesting. Such programs should include literacy initiatives and courses in skills like digital literacy, which can improve long-term employment prospects (Hoppers, 2006). Studies by UNICEF and the Indian Ministry of Education indicate that improving access to education leads to better outcomes for children and contributes to the development of more sustainable and economically stable communities.

1.17.3. Health and Welfare Programs

Salt pan workers are exposed to a range of health risks, from heat-related illnesses to skin infections caused by direct contact with brine. Implementing more robust health programs is essential to address these challenges (Jenkins, 2003). Mobile healthcare units could be deployed in salt pan regions to provide workers with immediate access to medical treatment, particularly during peak seasons when medical facilities are far and few between (Drechsel et al, 2009).

In addition to immediate care, long-term health programs should include education on preventing heatstroke, dehydration, and the effects of prolonged salt exposure. The introduction of health insurance plans for workers, along with subsidized access to necessary healthcare services, would improve their well-being (Nash, 2014). The World Health Organization (WHO) emphasizes the importance of accessible healthcare for vulnerable populations, and such programs would not only improve the quality of life for salt pan workers but also reduce their healthcare costs in the long run

1.17.4. Gender Equality Initiatives

Salt pan workers are often subject to a gendered division of labour with women performing the less physically demanding tasks but still playing a crucial role in salt production. However, women are often paid less than their male counterparts and lack access to skill training that could help them advance in the workforce (Hilson, 2003).

To foster gender equality, policies should ensure equal pay for equal work and promote women's participation in all aspects of salt production, including the more physically demanding tasks (De Schutter, 2013). Training programs should also be implemented to give women the skills they need to move into higher-paying positions or diversify their income sources.

Supporting women's leadership within salt pan communities can further strengthen economic stability, as studies by the United Nations Development Programme (UNDP) have shown that gender equality significantly contributes to long-term sustainable development (Akimoto et al., 2012).

1.17.5. Sustainable Livelihoods

Encouraging the diversification of income sources can help salt pan workers mitigate the seasonal nature of salt harvesting and reduce their dependence on salt production alone. One viable option is promoting alternative livelihoods, such as beekeeping or the production of handicrafts (Bradbear & Nations, 2009).

Skill development programs should teach workers how to produce and market products such as honey, beeswax, and other by-products, which can be sold year-round, reducing seasonal economic fluctuations (Hilmi et al., 2011). Handicraft production, particularly using locally sourced materials, can also provide a reliable source of income outside of salt production (Hilson, 2003).

Several successful case studies have shown that promoting alternative livelihoods can improve the economic standing of workers in salt pan communities. For example, a program in Tamil Nadu introduced beekeeping to salt pan workers, leading to increased income and better food security for their families (Van Huis & Nations, 2013).

The sustainable development of salt pan workers requires a multi-faceted approach that includes legal protection, educational opportunities, health interventions, gender equality, and income diversification (Jha et al., 2013). By addressing these key issues, salt pan workers can be better supported, leading to improved quality of life and more sustainable salt production practices. These steps will help break the cycle of poverty, improve

workers' health, and create a more equitable and prosperous future for salt pan communities (Heller, 2022).

1.18 SIGNIFICANCE OF THE STUDY

Health issues faced by salt workers stem from both natural and occupational hazards inherent in their work environment. However, many of these problems, especially those related to working conditions, could be alleviated through technological advancements and improved safety protocols.

Common health problems among salt workers include ophthalmic issues such as irritation, traumatic ulcers, and dermatitis, often resulting from prolonged exposure to sunlight and the glare reflected off the salt crystals. These problems are exacerbated by the lack of proper protective equipment, such as goggles and appropriate clothing. Additionally, musculoskeletal issues, including joint and muscular pain, are frequently reported, along with symptoms like headaches, dizziness, and breathlessness, often caused by the physical strain and harsh environmental conditions of the worksite.

The socio-economic situation of salt workers often exacerbates these health challenges. Many are employed on a contract basis and receive low wages, which are insufficient to maintain a decent quality of life. During off-seasons, workers often resort to borrowing money from informal lenders or taking advances from salt producers, trapping them in a cycle of economic dependency and exploitation. Furthermore, the poor environmental conditions - extreme heat, saline water, and a lack of safety measures contribute to stress and dissatisfaction among workers.

To address these challenges, urgent measures are needed to prevent occupational health issues. These include providing essential protective gear

such as goggles, gloves, and proper footwear; improving access to healthcare services; and introducing mechanization to reduce the physical toll of manual labour. Socio-economic reforms such as ensuring fair wages, access to organized credit facilities, and the provision of basic amenities can significantly improve the quality of life for these workers.

In regions like Thoothukudi, where salt production is a major source of livelihood, addressing these intertwined health and socio-economic issues is critical. A comprehensive approach that combines technological innovations, improved health standards, and policy interventions can substantially enhance the physical and mental well-being of salt workers, ultimately contributing to a more sustainable and equitable industry.

1.19 CONCLUSION

Salt workers are seasonal workers with a marginal source of income. There is a lack of social and health security for salt workers. They are exposed to hazardous work-environmental factors and work in extreme climatic conditions. Workers also suffer from different occupational health conditions, and due to a lack of education and awareness, they pay no attention to these occupationally hazardous conditions. There is a lack of motivation towards the use of personal protective equipment. All the workers have abusive oral habits and poor personal hygiene. There are salt workers' settlements that lack basic amenities like portable drinking water, toilets, and waste management systems. The government and local non-governmental organizations should pay attention to the health and socioeconomic status of salt workers. They should be enrolling in various skill development programmes and exploring alternate modes of livelihood.

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The review of related studies is a crucial component of research investigation. It enables the researcher to acquire up-to-date knowledge about the developments in their specific field and identify gaps for further exploration. A summary of previous references and the writings of recognized experts provides evidence that the researcher is familiar with what is already known and what remains unknown or untested (Best 1992). A careful review of research journals, books, dissertations, theses, and other sources of information related to the problem under investigation is one of the most important steps in planning any research study (Lokesh Koul 1990).

A summary of previous research and the writings of recognized experts provides researchers with familiarity regarding what is already known and what remains unknown. The literature review is "a process of finding the sources of relevant material for a particular topic or subject. " Literature means "the selection of available documents (both published and unpublished) on the topic, which contains information, ideas, data and evidence written from a particular standpoint to fulfill certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents about the research being proposed (Galvan 2009). Since effective research must build on past knowledge, this step helps eliminate duplication of existing work and offers useful hypotheses and valuable suggestions for meaningful investigation."

Review of the literature is a crucial step that invariably minimizes the risk of dead, rejected topics, rejected studies, wasted effort and trial and error activity oriented toward approaches already discarded by previous investigators and erroneous findings based on a faculty research design.

2.2 PURPOSE OF THE REVIEW OF RELATED LITERATURE

The purpose of reviewing related studies includes the following:

- It provides theories, ideas, explanations, or hypotheses that may prove useful in the formulation of a new problem (Booth, Colomb, & Williams, 2008).
- It indicates whether the evidence already available solves the problem adequately without requiring further investigation. It avoids the replication (Fink, 2014).
- It provides the sources for the hypothesis. The researcher can formulate research hypotheses based on available studies (Hart, 1998).
- It suggests methods, procedures, sources of data, and statistical techniques appropriate to the solution of the problem (Creswell, 2014).
- It locates comparative data and findings useful in the interpretation and discussion of results. The conclusions drawn in the related studies may be significantly compared and may be used as the subject for the findings of the study (Randolph, 2009).
- It helps in developing expertise and general scholarship of the investigator in the area investigated (Booth et al., 2008)

2.3 STUDIES CONDUCTED IN INDIA

Vidhya Venugopal & Rekha Shanmugam (2023) conducted a study on “Heat stress among salt pan workers of Tamil Nadu”. This study argued that Chronic exposure to heat and strenuous activity creates metabolic heat. It combined with insufficient hydration to compensate for sweat losses, can be

a risk factor for kidney injury. Workers often consume inadequate amounts of water, highlighting the urgent need to provide access to palatable drinking water, safe sanitation, and education on the importance of staying hydrated in the workplace. Salt pan workers operate under extreme heat, primarily between 6 AM and 2 PM, with minimal breaks. They face a lack of shaded areas and inadequate sanitation facilities, which particularly affects women workers. Symptoms like dehydration, dizziness, muscle cramps, and headaches were commonly reported, with 93% experiencing at least one heat-related symptom. The provision of shaded resting areas, better sanitation, and access to potable water could mitigate heat stress risks. Educating workers and employers about hydration and regulated rest periods could significantly improve health outcomes. The paper also underscores the vulnerability of informal workers to climate change, emphasizing the need for low-cost interventions to protect their health in extreme environments.

Chirag Harishbhai Chauhan (2022) conducted a study on “The Effect of Salt on The Health of Workers”. This study included 37 workers, both male and female for the pilot survey. The pilot survey revealed that almost all workers had an abusive oral habit. The majority of the salt workers had musculoskeletal disorders (joint, knee, and shoulder pain). Ophthalmic issues such as blurred vision, refractory error, eye-watering, and poor vision were common among the workers. General signs of anemia were present among women workers. Furthermore, female workers also complained of abdominal pain and cramps, as well as recurrent urinary tract problems. The paper also addresses solutions for improving the health and well-being of these workers by exploring better working conditions and preventive measures. Chauhan's work provides a valuable contribution to understanding the intersection of labour conditions and health, particularly in the context of salt production,

where workers face unique challenges due to environmental factors and their prolonged exposure to salt.

Henry Pandian & Janaki Vimal (2021) conducted a study on “An Economic Analysis of Health Problems of Salt Workers in Thoothukudi District”. The study reveals that salt workers are affected by occupational diseases, and 37.77 percent of them suffer from eye and skin diseases. The salt workers are of the view that they do not have good medical facilities for treating occupational diseases. This study explores the occupational challenges faced by salt workers in the region. Salt production in Thoothukudi is significant on both national and international levels. The workers endure harsh environmental conditions and are highly prone to occupational diseases due to prolonged exposure to saltpans. Findings from the study include a high Incidence of Occupational Diseases: 60% of the workers suffer from diseases related to their occupation, with 37.77% experiencing eye and skin ailments. The study advocates reallocating resources to improve healthcare delivery, emphasizing early prevention and management of diseases. This approach could enhance health equity and empower communities by reducing socio-economic discrimination. The research also highlights that the conditions of salt workers are no better than those in other hazardous industries, underscoring the need for focused interventions to improve their living and working environments.

Selvam V & Karthikeyan K (2020) conducted a study on “Socio-economic and health conditions of salt pan workers in Tamil Nadu”. The objectives of this study are to assess the socio-economic conditions of salt pan workers, to analyze the occupational hazards faced by salt workers, and to study the impact of seasonal employment on the livelihood of workers. The findings of this study revealed that most salt pan workers suffer from severe health issues, including respiratory problems, skin diseases, and dehydration,

Workers faced irregular income due to the seasonal nature of salt production, leading to economic instability, lack of social security and healthcare facilities. The research highlights that salt pan workers in the region often live in poverty and face significant health risks due to their working conditions. These workers, predominantly from marginalized communities, face issues such as limited access to healthcare, poor sanitation, and unsafe working environments. Many of the workers experience physical ailments such as skin diseases, respiratory problems, and joint pains, attributed to prolonged exposure to harsh environmental conditions, including high salinity, intense sunlight, and exposure to dust and chemicals. The study points out that these workers are contributing to a key sector of the economy and lack adequate support systems, such as health insurance or access to social welfare programs. The research emphasizes the need for policy intervention to improve the working conditions and socio-economic status of these workers, including better healthcare access, fair wages, and legal protections to prevent exploitation.

Patel R & Singh P (2019) conducted a study on “Labour dynamics and occupational hazards in salt pans: A study in Gujarat and Tamil Nadu”. The objectives of this study are to understand the labour dynamics in salt pans, including seasonal migration patterns, to explore the occupational hazards, including heat exposure and musculoskeletal disorders, faced by workers and to examine the role of gender in salt pan labour. The findings of this studies are women workers in the salt pans were found to be underpaid and overworked compared to their male counterparts, Musculoskeletal disorders and severe heat exposure were identified as the primary occupational hazards and the study recommended providing basic amenities such as drinking water, first-aid facilities, and protective gear for workers. The study highlights the critical need for policy interventions to improve working

conditions, ensure fair wages, and provide healthcare and safety measures for these workers.

Vasudevan et.al (2019) conducted a study on "Common Morbidities and Felt Needs of Salt Pan Workers in a Coastal Area of Tamil Nadu, India." The objective is to assess common health problems and the perceived needs of salt pan workers in Marakkanam, Tamil Nadu. The study identified dental caries (41.7%), skin conditions (38.1%), musculoskeletal problems (36.7%), and anemia (35.1%) as common health issues. Workers expressed the need for improved working conditions, and social support from the government and employers, and had low awareness regarding the use of personal protective equipment.

Yadav (2017) conducted a study on "The integral role that women play in the salt production industry in Rajasthan". The research highlights the socio-economic challenges faced by these women, including limited access to education, poor working conditions and a lack of recognition for their work, The study also emphasizes the resilience and adaptability of these women in overcoming these challenges. It presents a detailed case study from Rajasthan, showcasing both the hardships and the agency of women working in the salt pans. Yadav also highlights the role of traditional knowledge passed down through generations, which helps women manage the difficult work of salt production. The study stresses the importance of integrating gender-sensitive policies to improve the living and working conditions of these women. This could include better healthcare facilities educational opportunities and fair wages for the workers which would empower them to overcome the socioeconomic barriers they face.

Durairaj & Murugan (2016) conducted a study on "Health Hazard of Salt Workers in Tamilnadu". This study recommends that the government as well as producers has to create more awareness among the workers of the salt

industry regarding different hazards of the workplace and the action required to be taken for safe working. The training needs to the workers in connection with safety management should be reviewed at regular intervals and the training inputs must be given in a planned and phased manner. The research highlights that these workers are commonly exposed to various health issues such as eye problems (including photo-dermatitis), skin conditions like allergic dermatitis, and fungal infections. These occupational health problems (OHPs) are primarily caused by the harsh working environment which includes exposure to intense sunlight and salt-laden air.

Cherian et al. (2015) conducted a study on "Study of Morbidity Pattern Among Salt Workers in Marakkanam, Tamil Nadu, India." The objective is to assess the morbidity pattern among salt workers in Marakkanam, Tamil Nadu. The study revealed that 87% of salt workers had some form of morbidity. The prevalent health issues included clinical pallor (44.4%), ocular morbidities such as cataracts and pterygium (42%), dental caries (41.7%), hypertension (23.3%), underweight (19.3%), goiter (19%), obesity (14.8%), and dermatological conditions like dermatitis (9.1%).

Vijayalakshmi S & Ramalingam P (2015) conducted a study on "Health Hazards Among Saltpan Workers in Tamil Nadu". This study focuses on the significant health issues faced by saltpan workers in Tamil Nadu and provides detailed insights into the environmental and occupational hazards. Saltpan workers in Tamil Nadu are exposed to extreme temperatures with prolonged exposure to the sun and heat leading to dehydration, heat strokes and exhaustion. The workers are often engaged in strenuous labour for long hours, which places immense physical strain on their bodies. Due to the salty and dusty environment of the salt pans, workers are at high risk of respiratory problems, including asthma, chronic bronchitis, and other lung diseases. Respiratory issues, workers also suffer from dermatological

problems such as skin irritation, burns, rashes, and infections caused by constant exposure to saltwater and sun. Due to the remote locations of saltpans, many workers have limited access to healthcare. This study points out that there are also gaps in health awareness among workers, who may not be fully informed about the potential long-term effects of their work on their health. The findings underscore the urgent need for policy changes and interventions to improve the health and safety standards for saltpan workers in Tamil Nadu, a population that is often marginalized and vulnerable to exploitation.

Jaiswal et al (2015) conducted a study on “Solar Pumps Help Indian Woman Salt Workers Escape from Poverty”. India is the third largest producer of salt in the world with 75 percent of Indian production of salt coming from Gujarat. Despite their crucial role in salt production, many salt workers, particularly women, continue to live in poverty. To sustain themselves during the production season they are often forced to borrow money from salt traders to cover essential expenses such as diesel, food and drinking water.

Jaiswal et al. (2015) conducted a study on “The challenges faced by Indian women salt workers”. This study suggested that the introduction of solar pumps in salt production areas has proven to be a game changer”. Solar-powered pumps are being used to alleviate the physical burden of water management in salt pans. Women were tasked with manually managing water in the pans, a process that was physically demanding and time-consuming. The introduction of solar pumps not only reduces the physical workload but also offers a more efficient sustainable solution helping workers save valuable time and energy. This innovation has empowered women by allowing them to engage in other activities such as salt collection

and processing, which are essential for the industry but were previously considered secondary due to the time-consuming nature of water management. The adoption of solar pumps becomes a crucial tool in breaking the cycle of poverty for many families in salt-producing regions by improving the efficiency of salt production and allowing workers more control over their working hours.

Khan (2007) conducted a study on “Socio-economic Conditions of Saltpan Workers in Gujarat”. This study provides an in-depth analysis of the challenges faced by saltpan workers in the Gujarat region, focusing on several key issues: The study highlights that saltpan workers face economic hardship due to low wages, long working hours and exploitation by middlemen. Despite the crucial role they play in salt production, their compensation does not reflect their labour intensity, and the work is often seasonal. The workers’ income is highly dependent on weather conditions and during adverse weather (like rains) leading to a loss of income. Saltpan workers are exposed to hazardous working conditions, prolonged sun exposure, high temperatures, and the risk of salt-induced health issues like skin diseases and respiratory problems. The study also touches on the limited educational opportunities for the children of saltpan workers. Since these communities are economically disadvantaged, many children are forced to drop out of school to assist their families in salt production.

Ganguli A (2007) conducted a study on "Knowledge, Attitude and Practices Related to Occupational Health Problems Among Garment Workers in Tamil Nadu, India." The Objective is to assess the knowledge, attitude and practices related to occupational health problems among garment workers in Tamil Nadu. It highlighted significant gaps between knowledge and practice regarding occupational health hazards. Workers were aware of health risks

but seldom used protective measures, underscoring the need for improved occupational health education and interventions.

Yousuf Khan A (2006) conducted a study on “Various aspects of mosquito bionomics in salt pan areas, with a particular focus on regions outside and adjacent to the salt pans near Ennore Creek, North Chennai”. The research revealed that rainwater pools formed in these areas were colonized by brackish or saline water mosquitoes. The study also highlighted the role of salt pans in the propagation of mosquito larvae, identifying specific mosquito species that thrive in the unique conditions of salt pan environments.

Shashikala (2006) conducted a study on “A Study on Nutritional and Health Status of Salt Workers”. This study examined the health and nutritional conditions of salt workers with a particular focus on salt pans in various regions. The study highlights the physical and nutritional challenges faced by these workers who endure harsh environmental conditions such as extreme heat, prolonged exposure to salt and the demanding manual labour involved in salt production. Shashikala observed that the majority of these workers belong to economically disadvantaged groups, with salt production serving as their primary source of livelihood. The study also noted that the absence of modern mechanical devices in the salt industry leads to slower production processes, as traditional methods of salt production remain prevalent. Salt workers show limited interest in diversifying into other fields, which coupled with outdated practices, contributes to their continued low standard of living.

Yugraj Singh (2006) conducted a study on “Socio-Economic Status of Workers in the Salt Industry in India”. This study recommends the recruitment of labourers in the saltpans should be direct not through labour contractors and children should be prohibited from working in the saltpans. Salt production in Rajasthan is a vital part of the region's economy it is often

characterized by informal labour practices, a lack of formal employment benefits and a reliance on seasonal work. This industry employs many workers in harsh environmental conditions, where they are involved in the labour-intensive process of salt harvesting, which includes tasks such as scraping, piling, and packing salt from vast salt pans. This situation highlights the need for better working conditions, improved labour rights, and stronger social support systems for salt pan workers.

Ravi K (2005) conducted a study on “Impact of climate change on the livelihoods of salt pan workers: A case study of South India”. The objectives are to investigate how climate change affects the salt pan industry, to evaluate the livelihood challenges faced by salt pan workers due to changing weather patterns and to suggest adaptation strategies for workers to cope with environmental changes. The findings of this study are rising sea levels and unpredictable monsoon patterns negatively impacted salt production, leading to a decrease in annual income, workers were forced to seek alternative livelihoods during periods of low production, leading to increased financial stress and the study emphasized the need for government intervention in providing training for alternative income sources. This study examines how climate change affects the livelihoods of salt-pan workers. The economic vulnerability of salt pan workers worsens due to these climatic impacts, affecting their overall resilience. The study recommends implementing adaptive measures like improved workplace facilities and heat mitigation strategies to ensure sustainability and safety.

Mohan S & Kumar R (2005) conducted a study on “Health and safety concerns among salt pan workers in India”. The objectives are to assess the occupational health risks associated with salt pan work, to evaluate the effectiveness of existing health and safety regulations and to recommend measures to improve working conditions for salt pan workers. The study

highlighted inadequate enforcement of health and safety regulations in salt pans, resulting in chronic health conditions among workers. High exposure to UV radiation and salt dust was linked to increased cases of skin cancer and eye disorders and the study recommended policy changes to ensure regular health check-ups, provision of protective clothing and better working conditions.

Sachdev et al. (2005) conducted a study on "Risk of High Blood Pressure in Salt Workers Working Near Salt Milling Plants: A Cross-Sectional and Interventional Study." The objective is to assess the risk of high blood pressure among salt workers near salt milling plants. Factors such as direct exposure to salt dust and high dietary salt intake were identified as contributing to elevated blood pressure levels. The study found a higher prevalence of hypertension among salt workers compared to the general population.

Mohan & Kumar (2004) conducted a study on "The health and safety concerns among Indian salt pan workers". This study highlights significant occupational hazards and socio-economic challenges. The study found that workers endure extreme heat, and exposure to saline water and harmful aerosols, leading to chronic skin conditions, musculoskeletal disorders, respiratory problems, and visual impairments. Despite their hard work, they receive meagre wages, often ranging between ₹50–100 daily, which exacerbates their financial insecurity. The lack of basic facilities such as potable water, toilets, and protective equipment severely impacts their well-being. Workers face seasonal unemployment and live in poor housing conditions, further undermining their quality of life. The study advocates for improved working conditions, adequate wages, and governmental support to mitigate these challenges.

2.4 STUDIES CONDUCTED IN ABROAD

Diop M (2020) conducted a study on the “Impact of climate change on salt production in Senegal”. The objectives of this study are to assess the impact of climate change on salt production in Senegal, to evaluate the socio-economic effects on salt pan workers due to reduced salt production caused by rising sea levels and erratic weather patterns and to propose adaptive strategies for the salt industry to mitigate the negative effects of climate change. Rising sea levels and increased rainfall variability have significantly affected salt production in Senegal, leading to reduced harvests and financial difficulties for salt workers. Many salt workers have been forced to seek alternative livelihoods, contributing to rural-to-urban migration and the study proposed the introduction of sustainable salt production practices and government intervention to support workers. The study explores the impacts of climate change on salt production, focusing on the vulnerabilities and adaptive strategies within the salt industry. The socio-economic implications of these climate impacts are profound, affecting the livelihoods of communities reliant on salt production. To address these challenges, the authors advocate for sustainable management practices, including improved water resource management, infrastructural resilience, and the adoption of climate-smart technologies.

Mwangi J (2020) conducted a study on “Environmental degradation and livelihoods of salt workers in Kenya”. The objectives of this study are to assess the impact of environmental degradation on salt production in Kenya, to analyze the socio-economic effects of salt production on workers' livelihoods, and to propose sustainable practices to preserve both the environment and salt workers' welfare. Environmental degradation including soil salinization and water contamination threatened the sustainability of salt production. Salt workers faced declining incomes as production levels fell

due to environmental issues. The salt production process in Kenya is associated with significant environmental degradation. Extensive deforestation for creating salt pans leads to habitat loss for local flora and fauna. The over-extraction of groundwater to fill evaporation ponds often results in reduced water availability for nearby communities. The destruction of mangrove forests along the Kenyan coast is particularly alarming. Mangroves are critical for maintaining coastal biodiversity, preventing soil erosion, and acting as natural carbon sinks. The removal of these ecosystems for salt pan construction not only disrupts the ecological balance but also accelerates climate change effects. The study underscores the need for a balance between industrial growth and environmental stewardship in Kenya's salt production sector.

Rahman & Hossain (2020) conducted a study on “Socio-economic vulnerabilities of salt farmers in Bangladesh: A study on the Kutubdia Island”. Objectives are to analyse the socio-economic vulnerabilities faced by salt farmers on Kutubdia Island, to explore the impact of climate change and rising sea levels on salt production and the livelihoods of workers and to provide policy recommendations for safeguarding the future of salt farming on the island. The salt farmers on Kutubdia Island faced severe vulnerabilities, including the loss of arable land to rising sea levels and the increased salinization of water resources, workers were often paid very low wages and lacked access to social security, making them highly vulnerable to economic shocks and the study recommended government interventions to provide financial support and introduce climate-resilient farming techniques. The study highlights the precarious conditions faced by these farmers due to environmental challenges, socio-economic constraints, and market fluctuations. The salt farmers in Kutubdia Island rely on traditional methods of salt production, which are labour-intensive and yield lower productivity

compared to modern techniques. Fluctuations in salt prices, driven by market monopolies and external competition exacerbate economic instability.

Oostendorp & Vrijer (2020) conducted a study on “The Socioeconomic Impacts of Salt Pans: The Case of Salt Workers in Sub-Saharan Africa” the socioeconomic challenges faced by salt pan workers in Sub-Saharan Africa, focusing on issues such as labour conditions, income disparities, and gender-based inequalities within the salt production industry. The research emphasizes that salt production in this region is largely informal, and the workers many of whom are women and children are subjected to poor working conditions, low wages, and limited access to social benefits. The study identifies several key factors affecting the livelihoods of salt-pan workers. These include the seasonal nature of salt production, which leads to inconsistent income, and the lack of legal protections for workers, resulting in exploitation and limited upward mobility. The paper also highlights the risks workers face due to the physically demanding nature of the job, such as exposure to harsh weather, dehydration, and musculoskeletal disorders. One of the central themes of the study is the gender inequality in the salt production industry. Women, who make up a large portion of the workforce, are typically engaged in less physically demanding tasks, such as collecting, washing and packing salt, yet they are paid less than their male counterparts who often handle the more strenuous tasks. The authors argue that addressing these disparities and improving the working conditions for women can lead to significant improvements in both the economic and social well-being of salt pan workers.

Mann & Chandra (2019) conducted a study on “Assessing the Impact of Salt Production on Local Communities in Southeast Asia”, In this study the authors examine the socio-economic and environmental consequences of salt production on the communities involved in the industry across Southeast

Asia. They assess how salt production impacts local livelihoods, health, and the environment. One of the central findings is the heavy reliance of rural communities on salt production for employment, despite the significant health risks involved, such as respiratory issues, skin problems, and dehydration. The research highlights that many workers, particularly in traditional, manual salt pans, face poor working conditions and lack proper health and safety measures. The seasonal nature of salt production leads to economic instability, which affects families' income security and their ability to invest in education and healthcare. The study also discusses the environmental effects of salt pans, including land degradation and water resource depletion. Despite these negative outcomes, salt production remains an essential economic activity for local communities, with limited alternatives available. The authors suggest that enhancing the sustainability of salt production through mechanization, better management of natural resources, and improved worker conditions could help reduce environmental damage and improve the lives of salt-pan workers

Johnson, R., & McCarthy, J. (2019) conducted a study on “Socio-economic dynamics and the future of the salt industry in Australia”. Objectives of this study are to explore the socio-economic factors influencing the salt industry in Australia, to investigate the working conditions and economic contributions of salt workers, and to analyse the industry's long-term sustainability in the face of environmental and economic challenges. The salt industry is a significant sector in the Australian economy, with a wide range of applications from food preservation to chemical manufacturing. This research provides valuable insights into the challenges and opportunities faced by the industry, such as environmental regulations, production costs, and the impact of climate change on salt production methods. Australian salt industry faces challenges related to

labour shortages, environmental regulations, and international competition. Salt workers were found to have relatively better working conditions compared to other countries, but economic pressures and automation threaten future employment opportunities and the study recommended investment in sustainable salt production and worker training programs. The study also examines how workers in the salt industry are affected by economic trends and what adaptations might be required for future sustainability.

Ali M & El-Naggar (2019) conducted a study on “Salt extraction and its socio-economic impact on coastal communities in Egypt”. The objectives of this study are to explore the socioeconomic impact of salt extraction on coastal communities in Egypt and to examine how salt workers’ livelihoods have been shaped by market dynamics and environmental changes. The findings are salt workers in Egypt faced erratic income due to price fluctuations and competition from imported salt, and the degradation of coastal ecosystems also impacted the productivity of salt pans. Salt extraction is a significant economic activity in Egypt, contributing to national income and providing livelihoods for thousands of coastal residents. The industry supports both large-scale industrial operations and small-scale artisanal salt production. It has also attracted foreign investment, which has boosted Egypt's global standing in salt exportation. However, the study highlights income disparities within the industry. While industrial players benefit significantly, small-scale workers often struggle with inadequate wages and a lack of job security. The economic benefits are not evenly distributed, leaving many coastal families in persistent poverty.

Santos, J & Delacruz, P (2019) conducted a study on “Global warming and its impact on salt harvesters in the Philippines: A comparative analysis”. The objectives are to assess the effects of global warming on the salt production industry in the Philippines, to compare the challenges faced by salt workers

in different regions of the Philippines, and to suggest strategies for improving the resilience of salt workers in the face of climate change. The salt harvesters in the Philippines were increasingly affected by erratic weather patterns, which disrupted the production cycle and reduced overall yields, and the health of workers was compromised due to prolonged exposure to extreme temperatures and inadequate health provisions. Their analysis compared traditional and modern salt production systems, with a focus on the socio-economic and environmental challenges brought about by climate change. The study highlights that rising global temperatures have shortened the effective harvesting season for salt producers. Prolonged rainy seasons and unpredictable weather patterns disrupt the solar evaporation process, a traditional method heavily relied upon in the Philippines. Coastal areas used for salt farming are increasingly exposed to salinization, affecting nearby agricultural lands and freshwater sources. The authors discuss emerging adaptation measures, including the use of modern salt production techniques such as mechanized evaporation and greenhouse technology, to mitigate climate risks. They advocate for government policies that support salt farmers through subsidies, technical training, and disaster relief programs. In comparing salt harvesting practices across Southeast Asia, the study emphasizes the need for regional collaboration in addressing the impacts of climate change. Lessons from neighbouring countries such as Thailand and Vietnam, which have implemented successful adaptation strategies, could be valuable for the Philippines.

Haque M & Rahman A (2019) conducted a study on “Climate resilience and salt workers’ adaptive strategies in Bangladesh”. The objectives of this study are to investigate the resilience of salt workers in Bangladesh to climate-induced challenges, assess the impact of rising sea levels and erratic weather on salt production and propose adaptive strategies for salt workers to

cope with climate change. The findings are salt workers in Bangladesh faced increased risks from rising sea levels and unpredictable rainfall, which reduced salt yields and income, and many workers had adopted short-term coping strategies such as temporary migration but lacked long-term adaptive measures. The study recommended government-led training in climate-resilient salt farming techniques and alternative livelihood options for workers. Bangladesh's salt industry, concentrated in the coastal districts of Khulna, Satkhira, and others, is highly dependent on weather patterns. Salt workers, often from marginalized communities, rely on solar evaporation methods for salt production, which are directly influenced by climatic conditions.

Haque & Rahman (2019) conducted a study on “Impact of Adopting Salt Tolerant Rice Varieties in the Coastal Areas of Bangladesh”. This study argues that while salt workers in Bangladesh are highly vulnerable to climate change, their adaptive strategies have helped them mitigate some of the adverse impacts. However, for these strategies to be effective in the long term, coordinated efforts from both the government and local communities are essential. Sustainable development in the salt industry will depend on climate-resilient infrastructure, capacity building, and diversification of livelihood options for salt workers.

Morris and Adderley (2018) conducted a study on “Health Impacts of Salt Production: A Comparative Study between Traditional and Modern Salt Pans in Western Asia” which explores the occupational health risks associated with salt production in traditional and modern salt pans. The research primarily focuses on workers involved in the salt production process in countries of Western Asia, comparing their exposure to health risks in older, manual salt pans and newer, mechanized salt production systems. The authors found that workers in traditional salt pans are more likely to

experience respiratory problems, skin conditions, and eye irritations due to prolonged exposure to salt dust, intense sun, and high-saline environments. These workers are also more vulnerable to musculoskeletal disorders due to the physical demands of salt collection and processing. The study emphasizes the need for improved safety measures in both traditional and modern salt pans, such as the provision of protective equipment, regular health screenings, and educational programs to raise awareness about health risks. The researchers also suggest that while modernization can reduce some health hazards, it should not be at the cost of the workers' social and economic well-being.

Martinez A (2018) conducted a study on “Socio-economic challenges of salt workers in Bolivia”. Objectives are to examine the living conditions of salt workers in Bolivia’s Uyuni Salt Flats, to assess the impact of salt extraction on the socio-economic stability of local communities, and to explore the role of tourism in supplementing the income of salt workers. This study reveals that salt workers in Bolivia rely heavily on tourism to supplement their income due to the low profitability of salt extraction, workers face challenges related to economic instability, lack of healthcare, and exploitation by middlemen and the study suggested the need for better government support and fair-trade initiatives.

Boateng Y& Asamoah (2018) conducted a Study on “Gender dynamics in salt production in Ghana: A focus on women workers”. The objectives are to explore the gender-specific challenges faced by women salt workers in Ghana, to assess the socio-economic impact of salt production on women’s livelihoods and to provide recommendations for improving gender equity in the salt industry. Findings are women salt workers were found to face significant wage disparities compared to their male counterparts, despite performing the same tasks women also faced additional challenges related to

health, particularly due to a lack of maternity benefits and inadequate sanitation facilities. Their study sheds light on the socio-economic and cultural factors influencing the participation of women in this sector, highlighting their critical yet undervalued contributions. Women are heavily involved in various stages of salt production, including harvesting, packaging, and marketing.

Silva & Costa D (2018) conducted a study on “Exploring the social and health impacts of salt production in Brazil”. The objectives of this study are to evaluate the health risks and social challenges faced by salt workers in Brazil, to investigate the working conditions, wages, and job security in the salt production sector, and to assess the role of local authorities in safeguarding workers' rights. The findings are that workers in Brazil experienced chronic health issues like respiratory problems, skin infections, and dehydration and Low wages and lack of access to healthcare were common issues, with workers often relying on informal employment contracts. The physical toll on salt workers is considerable. Workers are consistently exposed to high levels of salt dust and ultraviolet radiation, which contribute to respiratory ailments, skin disorders, and dehydration.

Ndoro T& van Zyl H (2017) conducted a study on “Occupational health risks in the salt industry: A case study of Namibia”. Objectives are to identify the major occupational hazards faced by salt workers in Namibia, to analyze the health outcomes associated with long-term exposure to salt and extreme working conditions, and to provide recommendations for improving worker safety in the salt industry. This study reveals that workers in Namibia's salt industry face significant risks such as respiratory issues, dehydration, and skin problems due to prolonged exposure to salt dust and the harsh working environment, leading to chronic health problems among workers and the study recommended the implementation of stricter safety

regulations and healthcare provisions for salt workers. The research identified hazards such as prolonged exposure to salt dust, which can lead to respiratory issues, as well as risks associated with physical labour, including musculoskeletal disorders. The study also emphasized the limited use of personal protective equipment (PPE) among workers, which exacerbates their vulnerability to these occupational hazards. The study underscores the need for enhanced safety measures, regular health screenings, and better access to protective equipment to mitigate these risks and improve the well-being of salt industry workers in Namibia.

Zhang Y & Chen L (2017) conducted a study on “Impact of technological changes on salt workers in China”. The objectives are to explore how technological changes in the salt industry have impacted workers in China and to assess the benefits and drawbacks of automation and modern machinery on salt production and employment. Findings are technological advancements, such as the introduction of automated machinery, significantly increased production efficiency but led to job losses among unskilled workers and many workers were unable to adapt to the new technologies due to a lack of technical training. China’s salt industry has undergone a shift from traditional manual methods, such as solar evaporation and artisanal extraction, to mechanized and industrialized production processes. These advancements have increased productivity and improved the quality of salt, allowing China to compete effectively in the global market. The study highlights the dual-edged nature of technological progress in China’s salt industry. While modernization has brought economic benefits and efficiency, it has also disrupted the livelihoods of traditional salt workers.

Hernandez & Vega (2017) conducted a study on “The economic and environmental impacts of salt production in Mexico’s Yucatán Peninsula”.

The objectives of this study are to explore the environmental impact of salt production on local ecosystems in the Yucatán Peninsula, to assess the socio-economic benefits and challenges for salt workers in the region, and to propose sustainable production methods that protect both workers and the environment. Findings are salt workers faced challenges such as inconsistent incomes due to fluctuations in production, but the industry remained a vital part of the local economy, environmental degradation, including the destruction of mangroves and saline water contamination, threatened the sustainability of salt production and the study emphasized the need for eco-friendly practices and government interventions to support the livelihoods of salt workers while preserving the environment. Environmental concerns have arisen due to the traditional methods of salt extraction, which are resource-intensive and contribute to habitat degradation. The study also delved into the implications of climate change and extreme weather events, noting their potential to disrupt salt production. Rising sea levels and hurricanes pose risks to the coastal saltworks, necessitating adaptive management strategies to mitigate environmental damage and economic loss. Efforts to integrate sustainable practices, such as adopting modern production techniques and conserving local ecosystems, have been recommended to ensure the longevity of the industry.

Khamin & Chokphukdi (2016) conducted a study on “Health and safety conditions of salt workers in Thailand: A case study”. The objectives are to assess the health and safety conditions of salt workers in Thailand's coastal salt farms, to explore the common occupational hazards faced by workers and their access to healthcare and to provide recommendations for improving safety standards in salt production. The study also emphasizes the lack of safety protocols and health awareness among the workers, many of whom do not have access to proper medical care or protective equipment. It discusses

the social and economic factors that contribute to these poor working conditions, including low wages and a lack of governmental regulation in rural salt-producing areas. The workers suffered from various health issues, including skin diseases, respiratory problems, and musculoskeletal disorders, lack of proper safety equipment and limited access to healthcare facilities exacerbated these issues and the study recommended introducing stricter safety regulations and worker training programs to mitigate health risks.

Fernandes & Caroline F (2016) conducted a study on “Salt pan ecology and its impact on the community structure of Halophilic Archaea” which reveals that 32 - 35 % of NaCl concentration is noted in pans known as crystallizers, having precipitated crude solar salt (Litchfield et al, 2000) favored by temperatures of 40°- 45°C. Fernandes points out that the ecological dynamics of salt pans could be influenced by human activity, including salt harvesting and changes in salinity levels due to climate variations. The study highlights how human practices in salt production can impact the microbial communities, which in turn affect the broader ecological health of these areas. Furthermore, the study underscores the broader ecological implications of these disruptions, suggesting that changes in microbial community structures could affect not only the salt production process but also the overall sustainability and health of salt pan ecosystems.

Jones & King (2016) conducted a study on “Ecology and Economy of Salt Production: An Overview of the Salt Pans”. This study analyzes the environmental and economic significance of salt production in Egypt, specifically focusing on the salt pan ecosystems and their contribution to the local economy. The study emphasizes the crucial role that salt production plays in the livelihood of local communities and its ecological implications, as the salt pans provide a unique habitat for various species, including halophilic microorganisms and migratory birds. The research highlights the

dual impact of salt pans on the local economy and environment. Economically, salt production supports thousands of workers, especially in rural areas where employment opportunities are limited. However, the environmental impact of salt production, particularly in traditional, manual salt pans, includes land degradation and the depletion of natural resources such as water. The study also points to the vulnerability of these ecosystems to climate change, which may affect both salt production and biodiversity in the region. The authors stress the need for more sustainable practices in salt production that balance economic benefits with ecological preservation

2.5 CRITICAL REVIEW OF LITERATURE

This chapter includes an extensive review of 42 studies relevant to salt pan workers, exploring diverse aspects such as socio-economic conditions, labour patterns, environmental challenges, and policy implications. By examining the objectives and findings of these studies, a holistic understanding of the salt industry and the plight of salt-pan workers has been established. Several studies effectively highlight the socio-economic struggles of salt pan workers, including low wages, seasonal employment, and lack of job security. Research should critically assess the impact of government policies and welfare programs on salt pan workers, identifying gaps and suggesting actionable improvements. These insights form the foundation for the subsequent analysis and discussion in this study, enabling a deeper exploration of the challenges and opportunities faced by salt pan workers in Thoothukudi. The studies conducted by Jones & King (2016), Khamin & Chokphukdi (2016), Zhang Y & Chen L (2017), Vijayalakshmi & Ramalingam (2015), and Shashikala (2006) collectively offer a multidimensional understanding of the salt pan industry, touching upon ecological concerns, economic aspects, health hazards, and technological transformations. Jones & King (2016) provide a broad overview of the

ecology and economy of salt production, emphasizing the need for balancing environmental preservation with economic gains. However, the absence of localized data and empirical case studies limits the practical relevance of their findings. Khamin & Chokphukdi (2016) focus specifically on the health and safety conditions of salt workers in Thailand, highlighting occupational hazards such as skin diseases, dehydration, and muscular disorders. While the study presents concrete field-based evidence and recommends safety interventions, its findings may not be easily generalizable beyond the regional context.

2.6 CONCLUSION

The review of related literature reveals that salt pan workers, particularly in regions like Thoothukudi, Gujarat, Tamil Nadu and Rajasthan face multiple socio-economic and health-related challenges due to the harsh and unregulated nature of their work environment. These studies highlight issues such as inadequate wages, lack of formal employment contracts, insufficient access to healthcare, unsafe drinking water, exposure to extreme weather conditions, and a high prevalence of occupational health hazards. Women workers, in particular, endure additional burdens due to gender-based discrimination and domestic responsibilities. The findings collectively emphasize the urgent need for stronger policy enforcement, improved welfare interventions, health awareness programs, and inclusive strategies that address both the economic and social dimensions of salt pan workers' lives. Future research and developmental efforts must focus on creating sustainable livelihood opportunities and ensuring decent work conditions to enhance the quality of life for these marginalized workers.

CHAPTER III

METHODOLOGY

3.1 INTRODUCTION

Planning a research design doesn't follow a single fixed blue print instead it varies based on the following factors; (a) the type of question posed, (b) the research's purpose, (c) the guiding paradigm or approach, and (d) the foundational philosophy, ontology and epistemology. This principle known as "fitness for purpose," emphasizes that the research purpose largely shapes both the design and methodology (Maykut & Morehouse, 2002). In this chapter, key considerations are outlined to help transform a broad area of interest into something practical, researchable and feasible. To make research operational, it's important to carefully plan each stage of the process. With this foundation, the researcher is well-prepared to begin the study. The researcher considers a range of options, selecting only those compatible with the research aims (Bulletin of the Atomic Scientists, 1970). This leads to a tailored framework or blueprint that's practical for the specific research situation, and ultimately, an actionable plan is established. The research process hinges on what the researcher aims to discover with design choices reflecting the research questions and overall purpose discussed earlier.

3.2 RESEARCH METHODOLOGY

Research methodology refers to the entire structured process involved in carrying out a research study. It is essentially the science of understanding how research is conducted. This procedure guides the researcher in performing tasks for describing, explaining and predicting outcomes during a study (Bhattacharjee, 2012). Methodology provides a systematic approach to solving research problems and can be thought of as a science focused on how

research is carried out. The various steps typically followed by a researcher involve examining the research problem and justifying the chosen methods and techniques while also explaining the rationale for not selecting alternative approaches. Research methodology details the methods, approaches and designs used throughout the study, thoroughly explaining and justifying these choices (Resources, 2021). It also considers the advantages and disadvantages of each, assessing their suitability for the specific research context.

3. 3 RESEARCH DESIGN

Research design fundamentally refers to the conceptual framework within which a study is conducted. It involves creating a plan to carry out the inquiry in the most efficient way aiming to achieve accurate generalizations, descriptions and predictions. In basic or fundamental research, this design is often highly structured whereas in applied research, a more flexible approach is usually adopted (Brown, 2017).

The design lays out the tools and methods to be used, as well as decisions about resource allocation, timing and the specific treatment appropriate to different situations (Ohno-Machado & Séroussi, 2019). This overarching structure that guides the execution of a research plan or program is known as the research design.

3. 4 METHODS OF RESEARCH

Research methods can be categorized in various ways and the choice of methods depends on the specific problem being investigated as well as the type of data required to address it (Lancaster, 2007).

For studies in education, the sociological research methods commonly applied include:

- i) Historical Method
- ii) Experimental Method
- iii) Genetic Method
- iv) Case study
- v) Survey Method

3.4.1. Method Adopted for the Present Study

The term "survey" refers to the collection of data from a relatively large number of cases at a specific point in time. This method involves interpretation, measurement, classification, evaluation, comparison and generalization all aimed at gaining a comprehensive understanding of and finding solutions to important educational issues (Geographic Information Systems and Science, 2011)

In this study, the investigators chose the survey method for educational research. Survey research examines both large and small populations by selecting and analyzing samples from the population to identify the incidence, distribution and interrelations of sociological and psychological variables(Adult Education Dissertation Abstracts, 1968). As a branch of social scientific research, survey research differs from status research by aiming for an accurate assessment of the characteristics of an entire population(Labor, 1964). By using a random sample, survey researchers can often obtain information similar to that of a full census but at a lower cost, with greater efficiency and sometimes with greater accuracy. Survey research focuses on people and their vital information, beliefs, opinions, attitudes, motivations and behaviors. The present study aiming to

determine levels of educational status, sociability, economic status, social support and health and hygiene, has thus employed the survey method.

3.4.2 Reasons for Selecting Survey Method

The Survey Method holds significance for several reasons:

- It offers a thorough understanding of underlying issues within the study area.
- It draws attention to needs that might otherwise go unnoticed.
- It supplies a wealth of information regarding the nature of educational phenomena.
- It enables the collection of data from a relatively large number of cases at a specific time.
- It focuses on generalized statistics for the entire population while also addressing individual characteristics.

3. 5 STEPS IN SURVEY METHOD

According to William Wireman (1985) the detailed steps in a survey method are as follows;

1. Planning
2. Development and application of sampling plan
3. Construction of questionnaire
4. Data collection
5. Translation of data
6. Data analysis
7. Conclusion and Reporting

3.5.1 Planning

A clear plan of action is essential to maintain the scientific rigor and objectivity of the study. This includes defining the problem, establishing operational definitions of variables and thoroughly reviewing and developing the survey design.

3.5.2 Development and Application of Sampling Plan

Defining and formulating the geographical area, selecting the sample and establishing a detailed sampling procedure are crucial steps. These elements outline the scope and methodology of the study, ensuring that data collection is systematic and representative of the population within the specified area(Adult Education Dissertation Abstracts, 1968).

3.5.3 Construction of Research Tool

Interview schedules, questionnaires and similar instruments are common tools for investigation, tailored to each study's needs. If ready-made tools are unavailable, researchers should carefully design appropriate alternatives(Adult Education Dissertation Abstracts, 1968). These tools must also undergo pilot testing with a small sample to ensure effectiveness before broader application in the study.

3.5.4 Data Collection

Data collection involved the proposed group of individuals or sources, using the selected research tool. Active participation from respondents is crucial to guarantee the data's comprehensiveness and authenticity, as it ensures a more complete and accurate representation of the study's focus.

3.5.5 Translation of Data

The handling of survey data involves initial steps especially in tabulation where required, developing category systems. These steps depend on the survey's scope and the type of data collected, ensuring that the material is systematically organized and technically prepared for detailed analysis.

3.5.6 Data Analysis

Data analysis involves methods aimed at breaking down phenomena into their constituent parts to gain deeper insights into specific aspects. Statistical analysis primarily focuses on counting the number of units within various classes and subclasses (Adult Education Dissertation Abstracts, 1968). When quantitative data is collected, class totals are obtained, allowing for the calculation of arithmetic means for each category. These summary tables provide a foundation for further more detailed analysis of the data (Adult Education Dissertation Abstracts, 1968).

3.5.7 Conclusion and Reporting

Once data is collected and analyzed, researchers must draw inferences and prepare a report. Interpretation allows researchers to reveal relationships and processes within their findings. The research report is essential, as the research remains incomplete without it. Given the relevance of the current study's topic, the investigator chose the survey method for data collection.

3. 6 STATEMENT OF THE PROBLEM

Salt pan workers in Thoothukudi district face numerous socio-economic and health challenges stemming from their demanding and often hazardous working conditions. Despite being vital contributors to the salt industry, these workers frequently contend with low wages, limited job security and

lack of social welfare support (Bulletin of the Atomic Scientists, 1985). Exposure to harsh environmental conditions leads to various health issues including skin and eye problems, respiratory ailments and musculoskeletal disorders. The salt workers are employed on contract basis and are paid very low remuneration not sufficient for leading quality of life. The economical and physical exploitation by lenders and traders makes their condition worst. In order to meet the off seasons cash requirements, the salt workers have to borrow money from any organized credit facility or money in the area (Bulletin of the Atomic Scientists, 1985). Salt producers also pay advance to workers during the beginning of season. The environmental condition in their working place is very poor (United States Department of the Interior Conservation Yearbook Series, 1973). The job causes lot of stress and unhappiness to the workers. As the salt pan workers do painful work constantly exposed to salt and salt pan environment, defects in their physical and mental health is inevitable (Bulletin of the Atomic Scientists, 1985). In this study, the investigators will make an attempt to find out the sociological status and living standard of salt pan workers in Thoothukudi.

The salt workers are exposed to adversities of environmental conditions as well as salt in the environment. There is a lack of information about their occupational health problems. The economic conditions of salt workers were deplorable during the pre-independence period (Curthoys & Lake, 2006). They spent the day between slush and mud with a starving stomach and with a half-appeased appetite. They possessed no comfortable dwelling and had no rest. Even after independence their progress was not satisfactory as was planned and expected (Dolot, 2011). The reason was that little importance was attached to the welfare of the salt labour. The Government of India is directly responsible for the welfare of labour employed in pans (Cazes & Verick, 2013). The responsibility to enforce the

labour welfare legislation in the private salt work rests with the State Governments. They have so far taken very little interest in the matter. As the industry is seasonal and the labour is generally local, the manufacturers have not cared much for the provision of labour in salt factories. They have been always under the clutches of the money lenders and employers. The salt workers are seen to migrate to other saltpans in order to earn their livelihoods, as they lack other employment opportunity (Peša, 2019). In addition to this, the salt workers also lack skills for doing any other work. Child and adolescent labour are on the rise in the saltpans as children also migrate with their parents and are engaged as salt workers.

While facing these problems, some of female salt workers stop the work with the employer and migrate to somewhere else in this district. Some of the salt workers inhale the salt powder which causes nasal problems. Some may have problems in lungs (Corrin & Nicholson, 2011). The salt workers sustain minor occupational injuries on their feet and hands which result in formation of ulcers. Salt workers do not use boots or other safety measures. As a result, their skin is often damaged by salt crystals and the spade used for sweeping them. This study aims to conduct an analytical investigation into the socio-economic status, working conditions, health impacts and support systems available to salt pan workers in Thoothukudi (Geraci & Lounsbury, 2005). By examining these aspects, the study seeks to highlight areas for potential policy intervention and improvement in the lives of these marginalized workers. By realizing their situation, the investigators carry out this study to reveal their real life condition of salt pan workers is quite meaningful.

3.7 TITLE OF THE STUDY

The study is entitled as *"An Analytical Study on Salt Pan Workers in Thoothukudi District"*.

3.8 OPERATIONAL DEFINITIONS OF IMPORTANT KEY TERMS

An Analytical Study

An Analytical Study is a methodological approach to investigating a topic by dissecting its elements to explore cause-and-effect relationships, patterns, and underlying dynamics (Richards & Morse, 2012). It emphasizes detailed evaluation and reasoning to uncover insights, support conclusions, or solve problems, often relying on qualitative or quantitative data. It aims to answer "how" and "why" questions to provide depth and clarity in understanding complex issues.

Salt Pan Workers

Salt Pan Workers are laborers engaged in the production of salt, typically in salt pans, large flat expanses of land or shallow basins where seawater or brine is evaporated to extract salt (Antczak, 2019). These workers perform physically demanding tasks, including pumping or channeling water, raking and collecting crystallized salt under extreme conditions, often in high heat and saline environments.

Thoothukudi District

Thoothukudi District also known as Tuticorin, is a coastal district in the southern state of Tamil Nadu, India. It is renowned for its maritime history, thriving port and salt production industry. The district lies along the Gulf of Mannar and is a hub for trade, fishing and pearl harvesting (Sikdar, 2018).

3.9 OBJECTIVES OF THE STUDY

Section – I

Percentage Analysis

1. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to age.
2. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to type of family.
3. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to marital status.
4. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to educational qualification.
5. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to nature of residence.
6. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to locality of residence.
7. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to type of house.
8. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to monthly income of family.

9. To find out the level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to number of children in the family.

Section – II

Differential Analysis

10. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to type of family.
11. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to marital status.
12. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to nature of residence.
13. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to locality of residence.

Section – III

Analysis of Variance

14. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social

inclusion, social support, physical health and mental health with reference to age.

15. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to educational qualification.
16. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to type of house.
17. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to monthly income.
18. To find out significant difference, if any, between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to number of children in the family.

3.7 HYPOTHESES

Section – I

Percentage Analysis

1. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to age is moderate.
2. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to type of family is moderate.

3. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to marital status is moderate.
4. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to educational qualification is moderate.
5. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to nature of residence is moderate.
6. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to locality of residence is moderate.
7. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to type of house is moderate.
8. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to monthly income of family is moderate.
9. The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to number of children in the family is moderate.

Section – II

Differential Analysis

10. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to type of family.

11. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to marital status.
12. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to nature of residence.
13. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to locality of residence.

Section – III

Analysis of Variance

14. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to age.
15. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to educational qualification.
16. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to type of house.

17. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to monthly income.
18. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to number of children in the family.

3.11 POPULATION FOR THE STUDY

The population for the present study is the salt pan workers residing at Thoothukudi district.

3.12 SAMPLE FOR THE STUDY

The study was conducted in Thoothukudi district. Among the salt pan workers in Thoothukudi district, 120 were selected randomly for the present investigation.

3.13. DISTRIBUTION OF THE SAMPLE

TABLE 3.1

Area-wise distribution of the sample

S.No.	Name of the Areas	Number of Respondents
1	Sathya Nagar	6
2	Keela Arasadi	5
3	Pattinammaruthur	3

4	T.Saveriarpuram	2
5	Davisapuram	5
6	Siluvaipatti	8
7	Caldwell Colony	2
8	CGE Colony	5
9	Komasapuram	6
10	Inigonagar	8
11	Boltenpuram	4
12	Shanmugapuram	2
13	Toovipuram	4
14	Threspuram	8
15	Vellaipatti	6
16	Komasapuram	8
17	Mapilai Oorani	5
18	Thainagar	8
19	Alagapuri	7
20	Poopalrayapuram	6
21	Keela Alangarathattu	5
22	Mela Alangarathattu	6
Total		120

Table 3.2

Distribution of the sample with respect to age

Category	Number
Age 18 – 21	7
Age 22 – 30	15
Age 31 – 35	32
Age 36& Above	66
Total	120

Figure 3.1

Distribution of the sample with respect to age

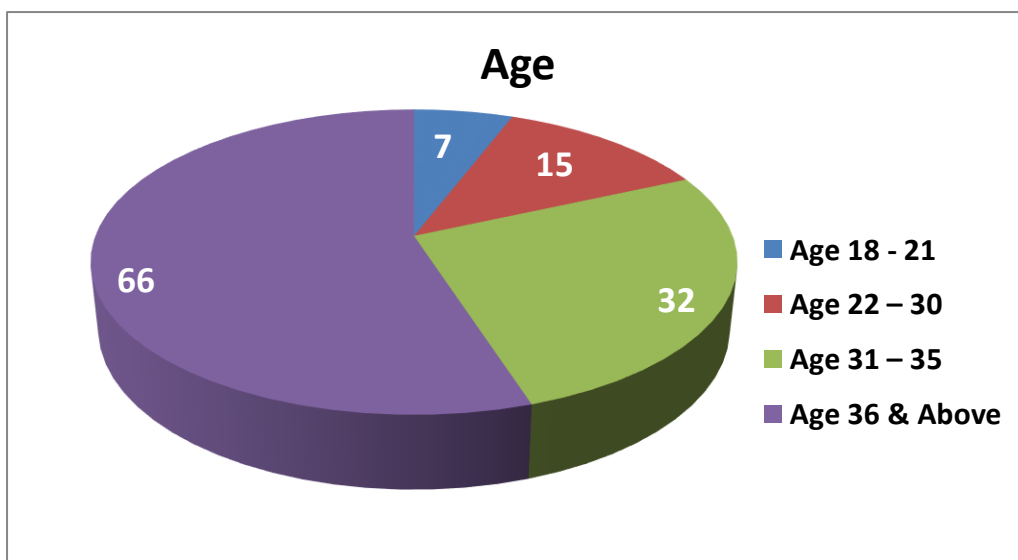


Table 3.4

Distribution of the sample with respect to type of family

Category	Number
Joint	14
Nuclear	106
Total	120

Figure 3.2

Distribution of the sample with respect to type of family

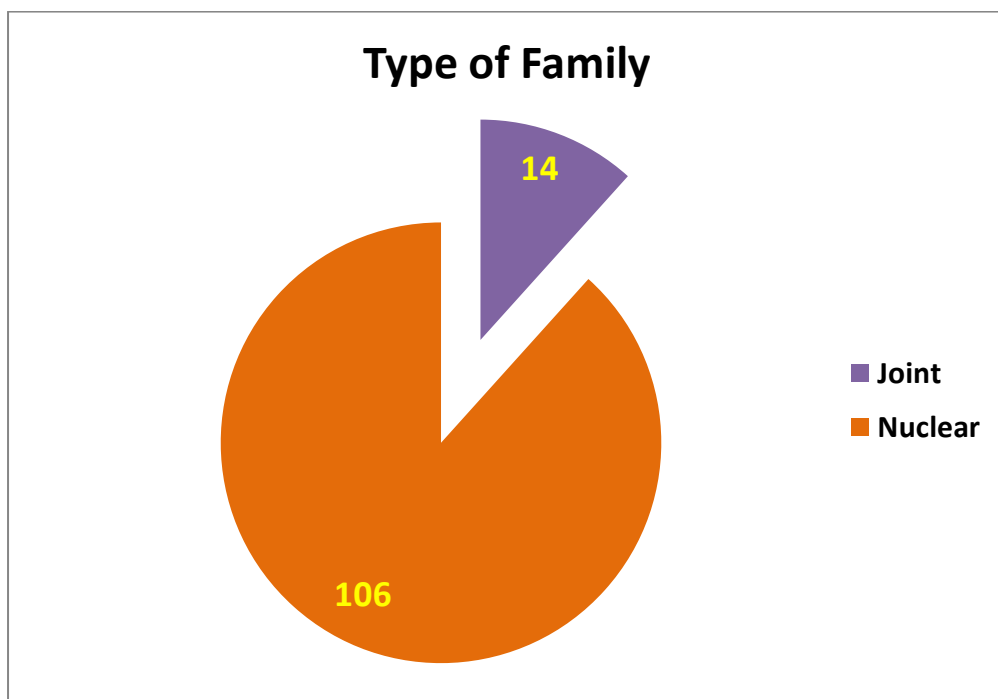


Table 3.5

Distribution of the sample with respect to marital status

Category	Number
Married	116
Unmarried	4
Total	120

Figure 3.3

Distribution of the sample with respect to marital status

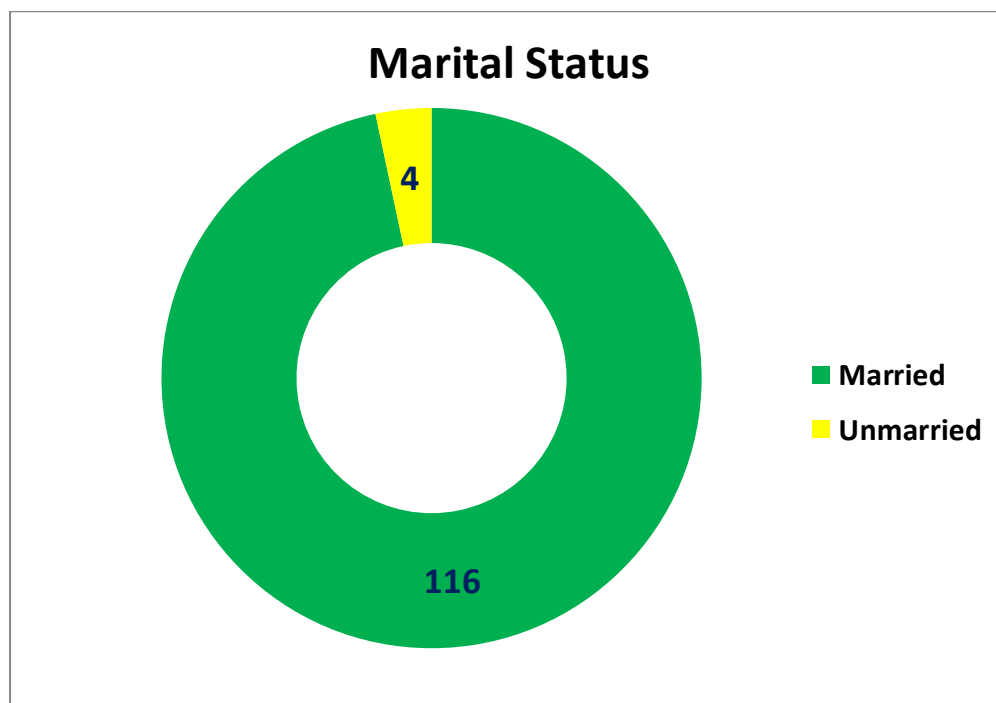


Table 3.6

Distribution of the sample with respect to educational qualification

Category	Number
Illiterate	84
Elementary Level	32
Secondary Level	4
Total	120

Figure 3.4

Distribution of the sample with respect to educational qualification

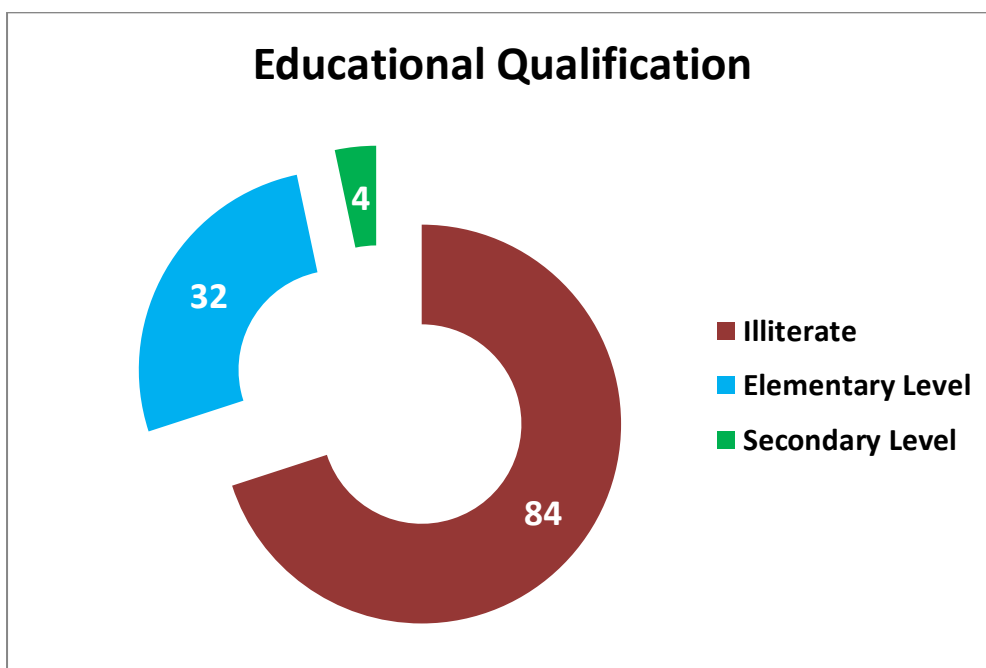


Table 3.7

Distribution of the sample with respect to nature of residence

Category	Number
Owned House	71
Rented House	49
Total	120

Figure 3.6

Distribution of the sample with respect to nature of residence

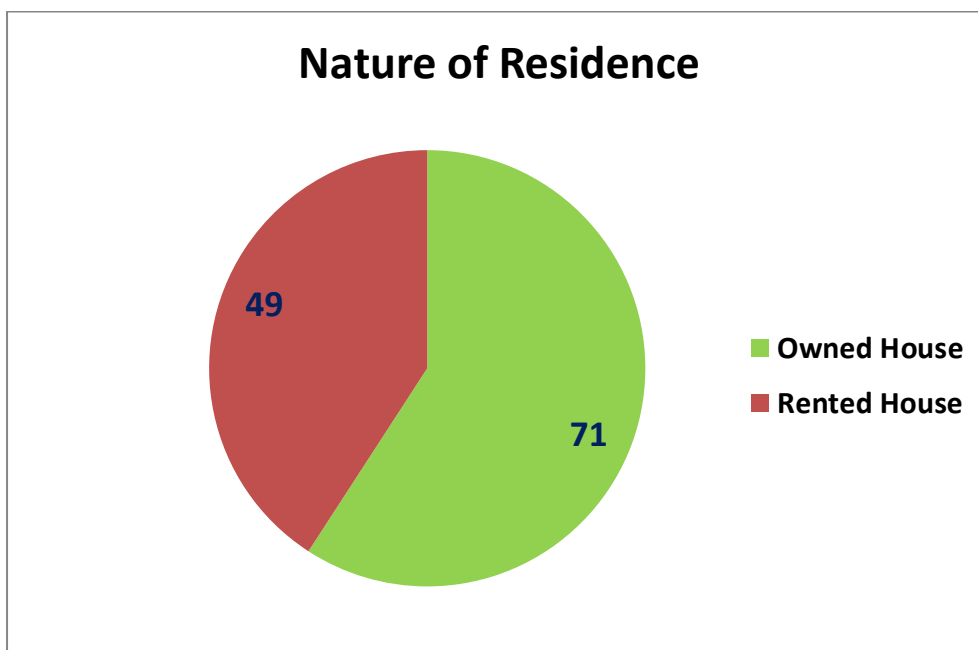


Table 3.8

Distribution of the sample with respect to locality of residence

Category	Number
Village	45
City	75
Total	120

Figure 3.7

Distribution of the sample with respect to locality of residence

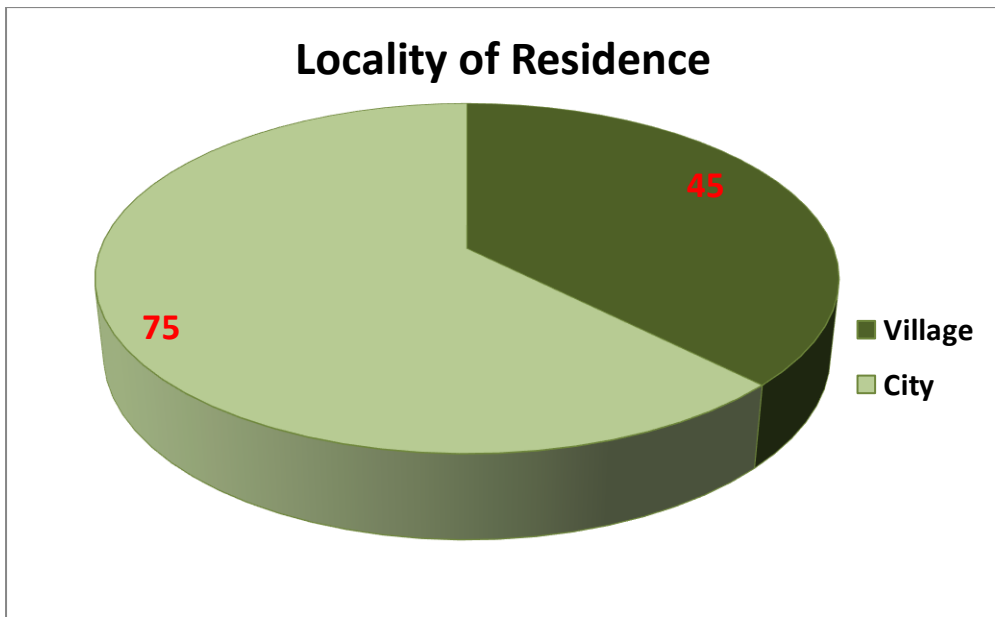


Table 3.9

Distribution of the sample with respect to type of house

Category	Number
Tent	24
Thatched	39
Concrete	57
Total	120

Figure 3.8

Distribution of the sample with respect to number of type of house

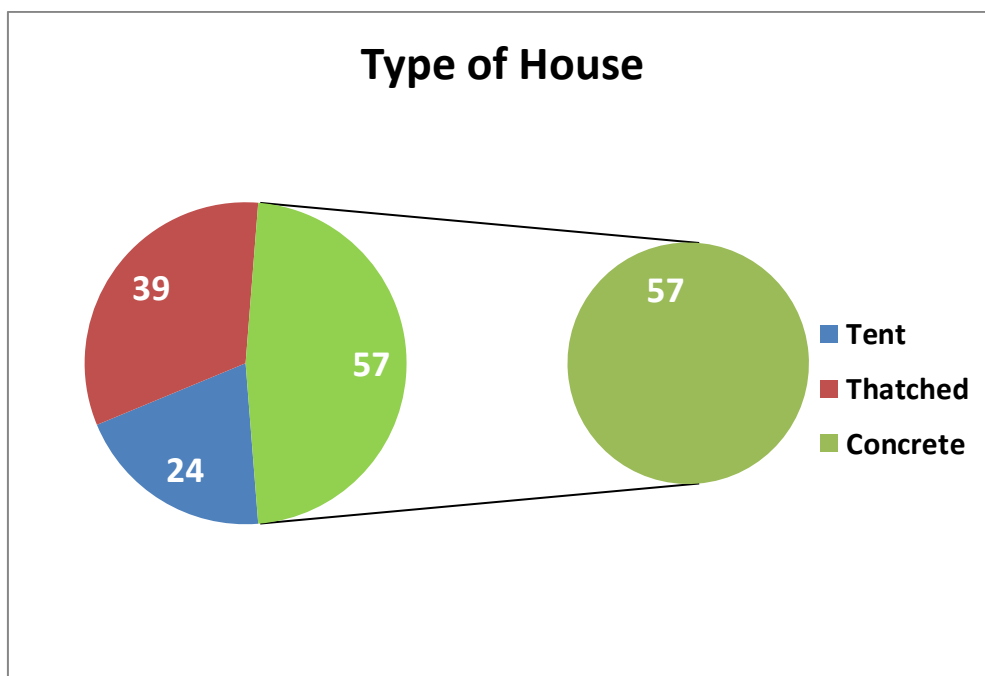


Table 3.10

Distribution of the sample with respect to monthly income of family

Category	Number
Rs.5000&below	29
Rs.5001-10,000s	58
Rs.10,001 - 20,000	28
Rs.20,001&above	5
Total	120

Figure 3.9

Distribution of the sample with respect to monthly income of family

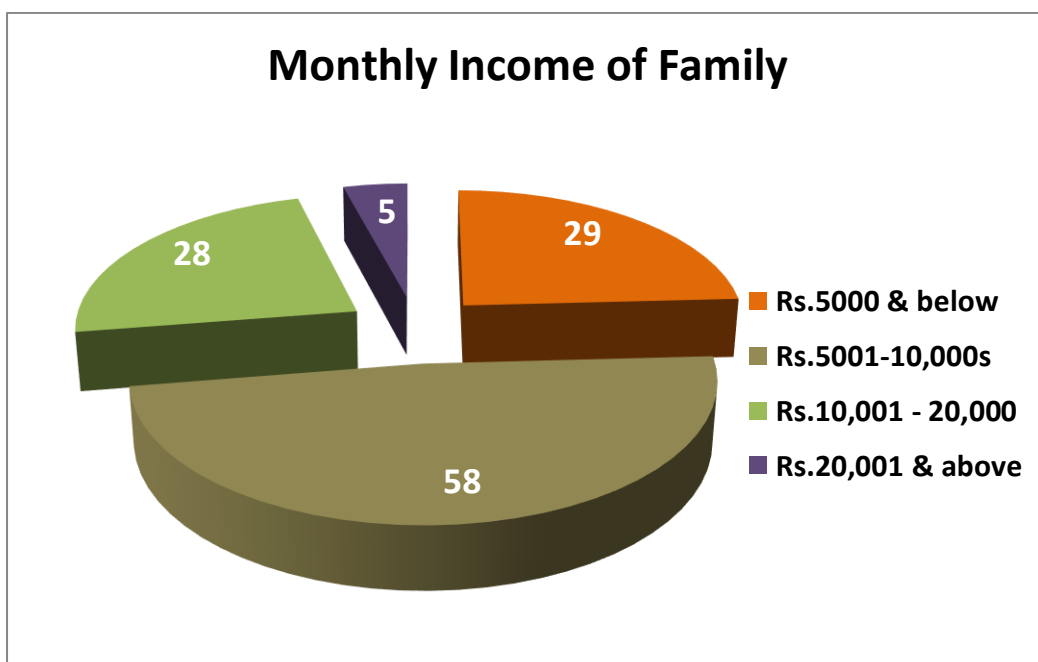


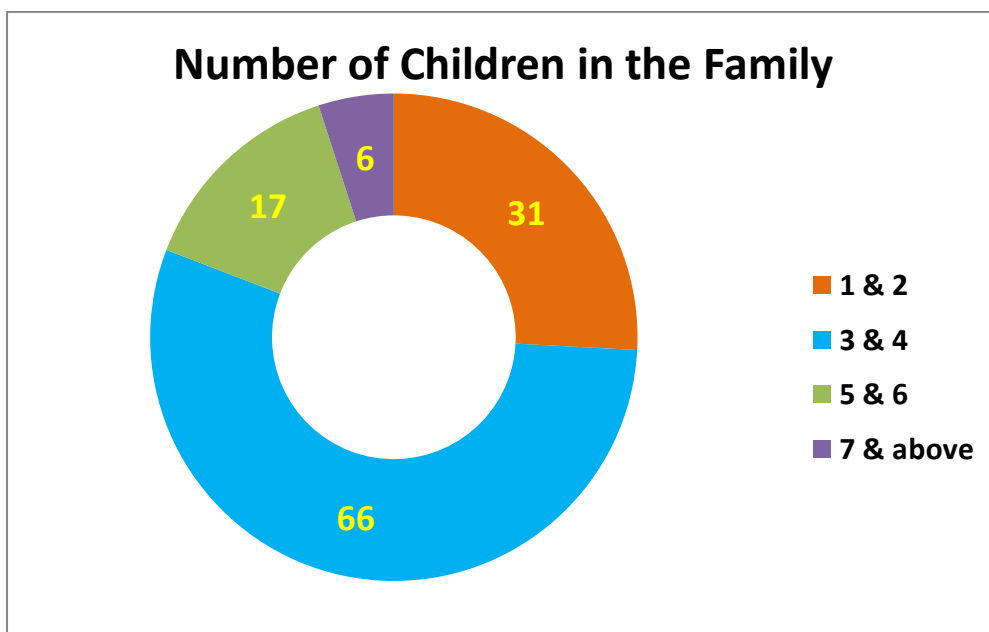
Table 3.11

Distribution of the sample with respect to number of children in the family

Category	Number
1 & 2	31
3 & 4	66
5 & 6	17
7 & above	6
Total	120

Figure 3.10

Distribution of the sample with respect to number of children in the family



3.12 TOOL FOR THE PRESENT STUDY

In this present study, the investigators have used self-made tool to measure educational awareness, economic status, social participation, social inclusion, social support, physical health, mental health of salt pan workers in Thoothukudi district. It was developed by the investigators. The self-made tool is; Questionnaire for Analytical Study on Salt Pan Workers in Thoothukudi District.

3.13 TOOL CONSTRUCTION

3.13.1. Questionnaire for Analytical Study on Salt Pan Workers in Thoothukudi District.

Development of the Tool

In the present study after a thorough survey on the available tool, the investigators have to go for a suitable tool that will measure the educational awareness, economic status, social participation, social inclusion, social support, physical health and mental health of salt pan workers Thoothukudi district. The major steps followed in the construction of this tool are described under different heads.

3.14 STEPS IN CONSTRUCTION OF TOOL

- | | |
|--------------------------|--|
| i) Planning of the tool | vii) Pilot study |
| ii) Item writing | viii) Final try out |
| iii) item editing | ix) Scoring |
| iv) Arrangement of items | x) Establishing Reliability and Validity |
| v) Preliminary try out | xi) Final form of tool |
| vi) Draft check list | |

Planning of the Test

The tool is to measure the educational awareness, economic status, social participation, social inclusion, social support, physical health and mental health of salt pan workers in Thoothukudi district. It was developed by the investigators. The self-made tool is; Questionnaire for Analytical Study on Salt Pan Workers in Thoothukudi district. Due considerations were given to the variables tested and to the different aspects involved.

Item Writing

An important step in constructing any research tool is the development of suitable items. After a thorough and careful review of the available literature, the investigators gathered materials and prepared the items. The Questionnaire includes the critical features of the required data and the evaluator must select one.

Item Editing

Each item in the tool was designed based on the respondent's psychology. Item editing involves checking and thoroughly scrutinizing the items. The items were reviewed by experts for necessary modifications and any ambiguous items were rewritten in a clear and meaningful manner (Bhattacharjee, 2012).

Arrangement of Items

The investigators read all the statements carefully. All the items were then arranged based on the nature of statements. The tool for the present study was constructed by the investigators under the following dimensions;

1. Educational Awareness
2. Economic Status

3. Social Participation
4. Social Inclusion
5. Social Support
6. Physical Health
7. Mental Health

Preliminary Try Out

A preliminary tryout was made to fix out the weakness and workability of the items. The difficulties in responding the items were noted. This step helped the investigators to modify the certain variables which were vague and questionable (Fraenkel & Wallen, 2005). For this purpose, the check list was used to measure educational awareness, economic status, social participation, social inclusion, social support, physical health and mental health of salt pan workers in Thoothukudi district.

Draft

The first draft was prepared by printing the items along with options for respondents to mark their answers. The layout was designed to ensure clarity and ease of understanding for the respondents. The draft was then reviewed to identify any errors in formatting, wording or organization (Iarossi, 2006). Feedback from experts and peers was incorporated to enhance the overall quality and reliability of the tool. This iterative process aimed to create scientifically sound instrument for data collection.

Pilot Study

The pilot study was conducted with 30 respondents selected from various areas in the Thoothukudi district using a simple random sampling technique. The primary objective of the pilot study was to assess the clarity, feasibility and reliability of the tool (Holmboe & Durning, 2023). Based on the

responses and feedback from the participants, necessary revisions were made to refine the items and improve the tool's effectiveness.

Final Try Out

Totally 120 salt pan workers in Thoothukudi district were selected as the sample.

3.15 ESTABLISHING RELIABILITY AND VALIDITY

Content Validity

To ensure content validity, the tool was submitted to a panel of experts in the field of education for their evaluation of the items' relevance and appropriateness. The experts' feedback was used to establish the content validity of the tool.

Item Validity

The pilot study aimed to establish the item validity of the research tool. It was administered to 30 salt pan workers who were randomly selected. Items in the check list assessing the educational awareness, economic status, social participation, social inclusion, social support, physical health and mental health of salt pan workers were chosen using item-total correlation. The investigators worked to refine the tool by identifying the most appropriate items for inclusion in the final version. Item analysis was conducted to determine the correlation of each item, and selection was based on the corresponding correlation values. The item was selected from 0.327 “r” value. Among the 40 items, 5 items were eliminated and 35 items were selected for the present study.

Table 4.14

Correlation value for the items in the questionnaire for salt pan workers

Items	'r' value	Remarks
1	0.5249	S
2	0.5302	S
3	0.5621	S
4	0.2113	NS
5	0.3861	S
6	0.5624	S
7	0.5368	S
8	0.4358	S
9	0.4951	S
10	0.3698	S
11	0.5368	S
12	0.8621	S
13	0.6213	S
14	0.2567	NS
15	0.5368	S
16	0.7625	S
17	0.4350	S
18	0.6257	S
19	0.5369	S
20	0.7584	S
21	0.6589	S
22	0.3054	NS
23	0.5612	S
24	0.4578	S

25	0.6398	S
26	0.5887	S
27	0.6201	S
28	0.6980	S
29	0.3198	NS
30	0.5349	S
31	0.4311	S
32	0.6003	S
33	0.3656	S
34	0.7812	S
35	0.7691	S
36	0.5360	S
37	0.5370	S
38	0.2095	NS
39	0.4359	S
40	0.4358	S

NS - Not Selected S - Selected

Reliability

For establishing the reliability of the tool, test-retest method was followed. For this draft tool was administrated with 30 salt pan workers randomly selected and observed. After 15 days the questionnaire was given to the same set of the salt pan workers. Then the product moment co-efficient of correlation was found. It is 0.73. Thus, the tool is taken as reliable.

3.16 SCORING

Agreement Points	Yes	No
Questions	1	0

(The maximum score is 35 and the minimum score is 0)

3.17 ADMINISTRATION OF THE TOOL

The investigators personally visited the salt pan workers residing in 22 different areas of Thoothukudi district, meeting them both at their workplaces in the salt pans and in their homes. They took time to build rapport with the respondents and thoroughly explained the purpose and details of the checklist. After clarifying doubts, the investigators carefully recorded the information provided by the workers. To ensure the accuracy and completeness of the data, they revisited certain respondents when necessary. Finally, all the data collected from the respondents was compiled and organized systematically for further analysis.

3.18 BACKGROUND VARIABLES

The investigator has taken 9 background variables for the present study. They are as follows;

1. Age : 18 -21 /22-30 /31 - 35/
36 &above
2. Type of Family : Joint/ Nuclear
3. Marital Status : Married/ Unmarried
4. Education : Illiterate/Elementary Level/Secondary Level
5. Nature of Residence : Owned House/ Rented House

6. Locality of Residence : Village / City
7. Type of House : Tent / Thatched / Concrete
8. Monthly Income of Family : Rs.5000&below/Rs.5001-10,000 /
Rs. 10,001 -20,000/ Rs. 20,001&above
- 9.Number of Children
in the Family : 1 &2/ 3 &4/ 5&6/ 7& above

3.15 STATISTICAL TECHNIQUES USED

The data collected from the respondents by administered the tool was processed with the help of the following statistics;

- Percentage Analysis
- Differential Analysis ('t' test)
- Analysis of Variance (F-test)

3.16 DELIMITATIONS

- The present investigation had been confined to salt pan workers those who are residing in Thoothukudi district only.
- The data were collected from Sathya Nagar, Keela Arasadi, Pattinammaruthur, T.Saveriarpuram, Davisapuram, Siluvaipatti, Caldwell Colony, CGE Colony, Komaspuram, Inigonagar, Boltenpuram, Shanmugapuram, Toovipuram, Threspuram, Vellaipatti, Komaspuram, Mapilai Oorani, Thainagar, Alagapuri, Poopalrayapuram, Keela Alangarathattu and Mela Alangarathattu only.

3.17 CONCLUSION

This chapter outlines the methodology adopted for the study including the approaches used for data collection and the framework for data analysis. The investigators detailed the procedures followed to ensure the reliability and validity of the research process. The collected data was systematically processed using appropriate statistical techniques presented in tabular formats for clarity and better understanding. The results obtained from this analysis were critically examined and interpreted. These interpretations along with their implications are discussed comprehensively in the succeeding chapter.

CHAPTER IV

ANALYSIS OF DATA

4.1 INTRODUCTION

Data analysis is one of the most critical components of research and also the most challenging. Many researchers find it difficult to perform this step independently due to its complex nature. Analysis plays a role in every stage of the research process. It begins with the selection of the problem, the determination of appropriate methods concluding with the interpretation of results and the drawing of conclusions from the collected data. (Bulletin of the Atomic Scientists, 1961)

Analysis refers to the systematic examination of organized and categorized data. This involves studying the characteristics of the subject under investigation and identifying patterns or relationships among the variables associated with it (Bulletin of the Atomic Scientists, 1955). Without thorough analysis, the data remains raw and unrefined, failing to yield meaningful insights or contribute to the advancement of knowledge.

The process of analysis often requires critical thinking and technical expertise. It demands the ability to evaluate data with precision, ensuring that the results are accurate and reliable. Researchers must scrutinize the relationships between variables, seeking to uncover patterns or trends that can explain the phenomena under study. (Education, 2021). This step is integral to transforming observations and measurements into coherent conclusions which form the foundation of any meaningful research output. Thus, analysis is not merely a stage in the research process but a continuous thread that runs through it. From defining the problem to interpreting the findings, analysis is essential for ensuring that the research is robust, valid and impactful. By critically examining data, researchers can unlock its potential to reveal new insights,

address significant questions and contribute to their field of study.

In this chapter, an attempt has been made to find out the level of Educational Awareness, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health of salt pan workers in Thoothukudi district. It examines the association between the background variables of adults in Tirunelveli district. Analysis of data means studying the tabulated material in order to determine inherent facts or meanings. It involves breaking down existing complex factors into simple parts together in new arrangements for the purpose of interpretation (Bhattacharjee, 2012b).

The major aim of the present study is to examine Educational Awareness, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health of salt pan workers in Thoothukudi district with respect to background variables. For the purpose of gathering data for the study, appropriate tool has been used with the sample of 120 salt pan workers in Thoothukudi district. The data thus collected were subjected to different types of quantitative treatment. The major procedures like percentage analysis, 't'-test and F-test were applied. The SPSS package was employed for the purpose of data analysis.

SECTION I

It deals with the level of Educational Awareness, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health of salt pan workers in Thoothukudi district with respect to age, type of family, marital status, education, nature of residence, locality of residence, type of house, monthly income of the family and number of children in the family.

SECTION II

It deals with significant difference between salt pan workers in Educational Awareness, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with respect to type of family, marital status, nature of residence and locality of residence.

SECTION III

It deals with significant difference among salt pan workers in Thoothukudi district under different dimensions; Educational Awareness, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with respect to Age, Education, Type of house, Monthly income of family and Number of children in the family.

4.2 DATA ANALYSIS

4.2.1 PERCENTAGE ANALYSIS

Null Hypothesis 1

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Age is moderate.

Table 4.1

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Age

Dimensions	(Age)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	18 -21	7	2	28.6	5	71.4	0	0.0
	22-30	15	4	26.7	11	73.3	0	0.0
	31-35	32	6	18.8	26	81.2	0	0.0
	36 & above	66	19	28.8	47	71.2	0	0.0
Economic Status	18 -21	7	7	100.0	0	0.0	0	0.0
	22-30	15	14	93.3	1	6.7	0	0.0
	31-35	32	26	81.2	6	18.8	0	0.0

	36 &above	66	61	92.4	5	7.6	0	0.0
	18 -21	7	0	0.0	7	100.0	0	0.0
Social	22-30	15	0	0.0	14	93.3	1	6.76
Participation	31-35	32	0	0.0	30	93.8	2	6.2
	36 &above	66	2	3.0	58	87.9	6	9.1
	18 -21	7	0	0.0	5	71.4	2	28.6
Social	22-30	15	1	6.7	9	60.0	5	33.3
Inclusion	31-35	32	1	3.1	20	62.5	11	34.4
	36 &above	66	5	7.6	40	60.6	21	31.8
	18 -21	7	7	100.0	0	0.0	0	0.0
Social	22-30	15	11	73.3	4	26.7	0	0.0
Support	31-35	32	25	78.1	7	21.90	0	0.0
	36 &above	66	45	68.2	7	10.6	14	21.2
	18 -21	7	5	71.4	0	0.0	2	100.0
Physical	22-30	15	15	100.0	0	0.0	0	0.0
Health	31-35	32	24	75.0	0	0.0	8	25.0
	36 &above	66	57	86.4	0	0.0	9	13.6
	18 -21	7	6	85.7	0	0.0	1	14.3
Mental	22-30	15	14	93.3	0	0.0	1	6.7
Health	31-35	32	28	87.5	0	0.0	4	32
	36 &above	66	57	86.4	0	0.0	9	13.6

It is inferred from the above table irrespective of the Age in their Educational Status, Economic Status, Social Participation, Social Inclusion are moderate in nature. Social Support, Physical Health and Mental Health are low.

NullHypothesis2

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Type of Family is moderate.

Table4.2

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Type of Family

Dimensions	(Type of Family)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	Joint	14	2	14.3	12	85.7	0	0.0
	Nuclear	106	29	27.4	77	72.9	0	0.0
Economic Status	Joint	14	12	85.7	0	0.0	2	14.3
	Nuclear	106	96	90.6	0	0.0	10	9.4
Social Participation	Joint	14	1	7.1	12	85.7	1	7.1
	Nuclear	106	1	0.9	97	91.5	8	7.5
Social Inclusion	Joint	14	1	7.1	11	78.6	2	14.3
	Nuclear	106	6	5.7	63	59.4	37	34.9
Social Support	Joint	14	9	64.3	3	21.4	2	14.3
		106	79	74.5	15	14.2	12	11.3
Physical Health	Nuclear							
	Joint	14	11	78.6	0	0.0	3	21.4

	Nuclear	106	90	84.9	0	0.0	16	15.1
Mental Health	Joint	14	14	100.0	0	0.0	0	0.0
	Nuclear	106	91	85.8	0	0.0	15	14.2

It is inferred from the above table irrespective of the Type of family in their Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support are moderate in nature. Physical Health and Mental Health are low.

NullHypothesis3

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Marital Status is moderate.

Table4.3

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Marital Status

Dimensions	(Marital Status)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	Married	116	31	26.7	85	73.3	0	0.0
	Unmarried	4	0	0.0	4	100.0	0	0.0
Economic Status	Married	116	105	90.5	11	9.5	0	0.0
	Unmarried	4	3	75.0	1	25.0	0	0.0
Social Participation	Married	116	2	1.7	114	98.3	0	0.0
	Unmarried	4	0	0.0	4	100.0	0	0.0

Social Inclusion	Married	116	7	6.0	109	94.0	0	0.0
	Unmarried	4	0	0.0	4	100.0	0	0.0
Social Support	Married	116	84	72.4	18	15.5	14	12.1
	Unmarried	4	4	100.0	0	0.0	0	0.0
Physical Health	Married	116	97	83.6	0	0.0	19	16.4
	Unmarried	4	4	100.0	0	0.0	0	0.0
Mental Health	Married	116	101	87.1	0	0.0	15	12.9
	Unmarried	4	4	100.0	0	0.0	0	0.0

It is inferred from the above table irrespective of the Marital Status in their Educational Status, Economic Status, Social Participation and Social Inclusion are moderate in nature. Social Support, Physical Health and Mental Health are low.

Null Hypothesis 4

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Educational Qualification is moderate.

Table 4.4

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Educational Qualification.

Dimensions	(Educational Qualification)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	Illiterate	84	22	26.2	62	73.8	0	0.0
	Elementary Level	32	8	25.0	24	75.0	0	0.0

Economic Status	Secondary	4	1	25.0	3	75.0	0	0.0
	Illiterate	84	74	88.1	0	0.0	10	11.9
	Elementary Level	32	30	93.8	0	0.0	2	6.2
Social Participation	Secondary	4	4	100.0	0	0.0	0	0.0
	Illiterate	84	2	2.4	75	89.3	7	8.3
	Elementary Level	32	0	0.0	30	93.8	2	6.2
Social Inclusion	Secondary	4	0	0.0	4	100.0	0	0.0
	Illiterate	84	5	6.0	50	59.5	29	34.5
	Elementary Level	32	2	6.2	20	62.5	10	31.2
Social Support	Secondary	4	0	0.0	4	100.0	0	0.0
	Illiterate	84	60	71.4	12	14.3	12	14.3
	Elementary Level	32	27	84.4	3	9.4	2	6.2
Physical Health	Secondary	4	1	25.0	3	75.0	0	0.0
	Illiterate	84	71	84.5	0	0.0	13	15.5
	Elementary Level	32	26	81.2	0	0.0	6	18.8
Mental Health	Secondary	4	4	100.0	0	0.0	0	0.0
	Illiterate	84	74	88.1	0	0.0	10	11.9
	Elementary Level	32	27	84.4	0	0.0	5	33.3
	Secondary	4	4	0.0	0	0.0	0	0.0

It is inferred from the above table that irrespective of the Educational Qualification in their Educational Status, Social Participation and Social Inclusion are moderate in nature. Economic Status, Social Support, Physical Health and Mental Health are low.

NullHypothesis5

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Nature of Residence is moderate

Table4.5

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Nature of Residence

Dimensions	(Nature of Residence)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	Owned House	71	17	23.9	54	76.1	0	0.0
	Rented House	49	14	28.6	35	71.4	0	0.0
Economic Status	Owned House	71	60	84.5	0	0.0	11	15.5
	Rented House	49	48	98.0	0	0.0	1	2.0
Social Participation	Owned House	71	2	2.8	64	90.1	5	7.0
	Rented House	49	0	0.0	45	91.8	4	8.2
Social Inclusion	Owned House	71	4	5.6	41	57.7	26	36.6
	Rented House	49	3	6.1	33	67.3	13	26.5
Social Support	Owned House	71	54	76.1	13	18.3	4	5.6
	Rented House	49	34	69.4	5	10.2	10	71.4
Physical	Owned House	71	58	81.7	0	0.0	13	18.3

Health	Rented House	49	43	87.8	0	0.0	6	12.2
Mental	Owned House	71	65	91.5	0	0.0	6	8.5
Health	Rented House	49	40	81.9	0	0.0	9	18.4

It is inferred from the above table that irrespective of the Nature of Residence in their Educational Status, Social Participation and Social Inclusion are moderate in nature. Economic Status, Social Support, Physical Health and Mental Health are low.

NullHypothesis6

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Locality of Residence is moderate

Table4.6

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Locality of Residence

Dimensions	(Locality of Residence)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	Village	45	13	28.9	32	71.1	0	0.0
	City	75	18	24.0	57	76.0	0	0.0
Economic Status	Village	45	42	93.3	0	0.0	3	6.7
	City	75	66	88.0	0	0.0	9	12.0
Social Participation	Village	45	2	4.4	38	84.4	5	11.1
	City	75	0	0.0	71	94.7	4	5.3
Social	Village	45	2	4.4	28	62.2	15	33.3

Inclusion	City	75	5	6.7	46	61.3	24	32.0
Social	Village	45	34	75.6	5	11.1	6	13.3
Support	City	75	54	72.0	13	17.3	8	10.7
Physical	Village	45	37	82.2	0	0.0	8	17.8
Health	City	75	64	85.3	0	0.0	11	14.7
Mental	Village	45	42	93.3	0	0.0	3	6.7
Health	City	75	63	84.0	0	0.0	12	16.0

It is inferred from the above table that irrespective of the Locality of Residence in their Educational Status, Social Participation and Social Inclusion are moderate in nature. Economic Status, Social Support, Physical Health and Mental Health are low.

Null Hypothesis 7

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Type of House is moderate

Table4.7

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Type of House

Dimensions	(Type of House)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	Tent	24	10	41.7	14	58.3	0	0.0
	Thatched	39	8	20.5	31	79.5	0	0.0
	Concrete	57	13	22.8	44	77.2	0	0.0

Economic Status	Tent	24	23	95.8	0	0.0	1	4.2
	Thatched	39	36	92.3	0	0.0	3	7.7
	Concrete	57	49	86.0	0	0.0	8	14.0
Social Participation	Tent	24	0	0.0	21	87.5	3	12.5
	Thatched	39	2	5.1	34	87.2	3	7.7
	Concrete	57	0	0.0	54	94.7	3	5.3
Social Inclusion	Tent	24	2	8.3	17	70.8	5	20.8
	Thatched	39	1	2.6	22	56.4	16	41.0
	Concrete	57	4	7.0	35	61.4	18	31.6
Social Support	Tent	24	19	79.2	3	12.5	2	8.3
	Thatched	39	26	66.7	6	15.4	7	17.9
	Concrete	57	43	75.4	9	15.8	5	8.8
Physical Health	Tent	24	19	79.2	0	0.0	5	20.8
	Thatched	39	36	92.3	0	0.0	3	7.7
	Concrete	57	46	80.7	0	0.0	11	19.3
Mental Health	Tent	24	21	87.5	0	0.0	3	12.5
	Thatched	39	34	87.2	0	0.0	5	12.8
	Concrete	57	50	87.7	0	0.0	7	12.3

It is inferred from the above table that irrespective of the Type of House in their Educational Status, Social Participation and Social Inclusion are moderate in nature. Economic Status, Social Support, Physical Health and Mental Health are low.

Null Hypothesis 8

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Monthly Income is moderate.

Table4.8

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Monthly Income

Dimensions	(Monthly Income)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%
Educational Status	Rs.5000&below	29	11	37.9	18	62.1	0	0.0
	Rs.5001-10,000	58	12	20.7	46	79.3	0	0.0
	Rs.10,001- 20,000	28	7	25.0	21	75.0	0	0.0
	Rs.20,001&above	5	1	20.0	4	80.0	0	0.0
Economic Status	Rs.5000&below	29	28	96.6	0	0.0	1	3.4
	Rs.5001-10,000	58	49	84.5	0	0.0	9	15.5
	Rs.10,001- 20,000	28	26	92.9	0	0.0	2	7.1
	Rs.20,001&above	5	5	100.0	0	0.0	0	0.0
Social Participation	Rs.5000&below	29	0	0.0	26	89.7	3	10.3
	Rs.5001-10,000	58	2	3.4	50	86.2	6	10.3
	Rs.10,001- 20,000	28	0	0.0	28	100	0	0.0
	Rs.20,001&above	5	0	0.0	5	100	0	0.0
Social Inclusion	Rs.5000&below	29	1	3.4	22	75.9	6	20.7
	Rs.5001-10,000	58	4	6.9	30	51.4	24	41.4
	Rs.10,001- 20,000	28	2	7.1	19	67.9	7	25.0
	Rs.20,001&above	5	0	0.0	3	60.0	2	40.0
Social Support	Rs.5000&below	29	23	79.3	4	13.8	2	6.9
	Rs.5001-10,000	58	42	72.4	8	13.8	8	13.8

Physical Health Mental Health	Rs.10,001- 20,000	28	20	71.4	5	17.9	3	10.7
	Rs.20,001&above	5	3	60.0	1	20.0	1	20.0
	Rs.5000&below	29	23	79.3	0	0.0	6	20.7
	Rs.5001-10,000	58	52	89.7	0	0.0	6	10.3
	Rs.10,001- 20,000	28	22	78.6	0	0.0	6	21.4
	Rs.20,001&above	5	4	80.0	0	0.0	1	20.0
	Rs.5000&below	29	26	89.7	0	0.0	3	10.3
	Rs.5001-10,000	58	50	86.2	0	0.0	8	13.8
	Rs.10,001- 20,000	28	24	85.7	0	0.0	4	14.3
	Rs.20,001&above	5	5	100.0	0	0.0	0	0.0

It is inferred from the above table that irrespective of the Monthly income in their Educational Status, Social Participation and Social Inclusion are moderate in nature. Economic Status, Social Support, Physical Health and Mental Health are low.

Null Hypothesis 9

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Number of Children is moderate.

Table4.9

The level of Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Number of Children

Dimensions	(Number of Children)	Low			Moderate		High	
		No.	No.	%	No.	%	No	%

Educational Status	1 &2	31	10	32.3	21	67.7	0	0.0
	3 &4	66	15	22.7	51	77.3	0	0.0
	5&6	17	3	17.6	14	82.4	0	0.0
	7& above	6	3	50.0	3	50.0	0	0.0
Economic Status	1 &2	31	28	90.3	0	0.0	3	9.7
	3 &4	66	59	89.4	0	0.0	7	10.6
	5&6	17	16	94.1	0	0.0	1	5.9
	7& above	6	5	83.3	0	0.0	1	16.7
Social Participation	1 &2	31	2	6.5	28	90.3	1	3.2
	3 &4	66	0	0.0	59	89.4	7	10.6
	5&6	17	0	0.0	16	94.1	1	5.9
	7& above	6	0	0.0	6	100.0	0	0.0
Social Inclusion	1 &2	31	1	3.2	21	67.7	9	29.0
	3 &4	66	6	9.1	41	62.1	19	28.8
	5&6	17	0	0.0	9	52.9	8	47.1
	7& above	6	0	0.0	3	50.0	3	50.0
Social Support	1 &2	31	24	77.4	4	12.9	3	9.7
	3 &4	66	49	74.2	10	15.2	7	10.6
	5&6	17	12	70.6	3	17.6	2	11.8
	7& above	6	3	50.0	1	16.7	2	14.3
Physical Health	1 &2	31	25	80.6	0	0.0	6	19.4
	3 &4	66	57	86.4	0	0.0	9	13.6
	5&6	17	13	76.5	0	0.0	4	23.5

	7& above	6	6	100.0	0	0.0	0	0.0
	1 &2	31	28	90.39	0	0.0	3	9.7
Mental Health	3 &4	66	58	87.9	0	0.0	8	12.1
	5&6	17	15	88.2	0	0.0	2	11.8
	7& above	6	4	66.7	0	0.0	2	33.3

It is inferred from the above table that irrespective of the Number of Children in their Educational Status, Social Participation and Social Inclusion are moderate in nature. Economic Status, Social Support, Physical Health and Mental Health are low.

4.2.2 DIFFERENTIAL ANALYSIS

Null Hypothesis¹⁰

There is no significant difference between salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Type of Family.

Table4.10

Difference between salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Type of Family

Dimension	(Type of Family)	N	Mean	S.D	Calculated t-value	Remarks at 5% level
Educational status	Joint	14	4.86	.363	1.598	NS
	Nuclear	106	4.68	.561		
Economic Status	Joint	14	.14	.363	0.480	NS
	Nuclear	106	.09	.294		
Social Participation	Joint	14	1.29	.726	-0.953	NS
	Nuclear	106	1.48	.679		
Social	Joint	14	1.14	.663	-0.997	NS

Inclusion	Nuclear	106	1.33	.643	0.526	NS
Social	Joint	14	.50	.760		
Support	Nuclear	106	.39	.738	0.195	NS
Physical	Joint	14	1.07	.616		
Health	Nuclear	106	1.04	.551	-4.160	NS
Mental	Joint	14	.00	.000		
Health	Nuclear	106	.14	.350	-0.362	NS
Total	Joint	14	9.00	1.468		
	Nuclear	106	9.15	1.453		

(At 5% level of significance the table value of 't' is 1.98)

It is inferred from the above table that the salt pan workers in joint family and nuclear family are not significantly different with Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health.

Null Hypothesis11

There is no significant difference between salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Marital Status.

Table4.11

Difference between salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Marital Status

Dimension	(Marital Status)	N	Mean	S.D	Calculated t-value	Remarks at 5% level
Educational	Married	116	4.69	.550	-6.074	NS
Awareness	Unmarried	4	5.00	.000		

Economic	Married	116	.09	.294		
Status	Unmarried	4	.25	.500	-.617	NS
Social	Married	116	1.45	.690		
Participation	Unmarried	4	1.75	.500	-1.169	NS
Social	Married	116	1.29	.646		
Inclusion	Unmarried	4	1.75	.500	-1.777	NS
Social	Married	116	.41	.747		
Support	Unmarried	4	.00	.000	5.968	S
Physical	Married	116	1.05	.557		
Health	Unmarried	4	.75	.500	1.182	NS
Mental	Married	116	.13	.337		
Health	Unmarried	4	.00	.000	4.133	S

(At 5% level of significance the table value of 't' is 1.98)

It is inferred from the above table that the salt pan workers belong to the category married and unmarried are not significantly different with Educational Status, Economic Status, Social Participation, Social Inclusion and Physical Health and significantly difference with Social Support and Mental Health.

Null Hypothesis12

There is no significant difference between salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Nature of Residence.

Table4.12

Difference between salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Nature of Residence

Dimension	(Nature of Residence)	N	Mean	S.D	Calculated t-value	Remarks at 5% level
Educational Awareness	Owned House	71	4.72	.539	0.440	NS
	Rented House	49	4.67	.555		
Economic Status	Owned House	71	.15	.364	2.813	S
	Rented House	49	.02	.143		
Social Participation	Owned House	71	1.44	.712	-0.424	NS
	Rented House	49	1.49	.649		
Social Inclusion	Owned House	71	1.34	.631	0.598	NS
	Rented House	49	1.27	.670		
Social Support	Owned House	71	.31	.623	-1.528	NS
	Rented House	49	.53	.868		
Physical Health	Owned House	71	1.14	.515	2.342	S
	Rented House	49	.90	.586		
Mental Health	Owned House	71	.08	.280	-1.525	NS
	Rented House	49	.18	.391		

(At 5% level of significance the table value of 't' is 1.98)

It is inferred from the above table that the salt pan workers having owned house and rented house are not significantly different with Educational Status,

Social Participation, Social Inclusion, Social Support and Mental Health and significantly different with Economic Status and Physical Health.

NullHypothesis13

There is no significant difference between salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Locality of Residence.

Table4.13

Difference between salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Locality of Residence

Dimension	(Locality of Residence)	N	Mean	S.D	Calculated t-value	Remarks at 5% level
Educational	Village	24	4.50	.659	-1.733	NS
Awareness	City	39	4.77	.485		
Economic	Village	24	.04	.204	-.587	NS
Status	City	39	.08	.270		
Social	Village	24	1.79	.658	2.510	S
Participation	City	39	1.33	.772		
Social	Village	24	1.17	.637	-1.626	NS
Inclusion	City	39	1.44	.641		
Social	Village	24	.29	.624	-1.321	NS
Support	City	39	.54	.854		
Physical	Village	24	1.21	.588	1.692	NS
Health	City	39	.97	.428		
Mental	Village	24	.13	.338	-.037	NS
Health	City	39	.13	.339		

(At 5% level of significance the table value of 't' is 1.98)

It is inferred from the above table that the salt pan workers residing in village and city are not significantly different with Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health and significantly different with Social Participation.

4.2.3 ANALYSIS OF VARIANCE

Null Hypothesis 14

There is no significant difference among salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Age.

Table 4.14

Difference among salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Age

Dimensions	Source of variation	df =3, 116		Calculated F Value	Remark at 5% level
		Sum of squares	Mean square variation		
Educational	Between Groups	0.384	0.128	0.427	NS
Awareness	Within groups	34.816	0.300		
Economic	Between Groups	0.370	0.123	1.373	NS
Status	Within groups	10.430	0.090		
Social	Between Groups	0.251	0.084	0.175	NS
Participation	Within groups	55.541	0.479		
Social	Between Groups	239	0.080	0.187	NS
Inclusion	Within groups	49.353	0.425		
Social	Between Groups	4.140	1.380	2.939	S
Support	Within groups	60.660	0.523		
Physical	Between Groups	1.748	0.583	1.928	NS
Health	Within groups	35.044	0.302		
Mental Health	Between Groups	0.062	0.021	0.183	NS
	Within groups	13.063	0.113		

(At 5% level of significance the table value of Fis 2.68)

Duncan test for Age Group

Table4.15

Mean scores in the dimension: Among salt pan workers with Social Support with reference to Age

Age Group	N	Subset for Alpha = 0.05	
		1	2
18 -21	7	0.00	
22-30	32	0.22	0.22
31-35	15	0.27	0.27
36 &above	66		0.56

It is inferred from the above table that the salt pan workers belong to the age group (18-21, 22-30, 31-35 and 36 & above) are not significantly different with Educational Status, Economic Status, Social Inclusion, Physical Health and Mental Health and significantly different with Social Support.

Null Hypothesis 15

There is no significant difference among salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Educational Qualification.

Table 4.16

Difference among salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Educational Qualification

Dimensions	Source of variation	df =2,117		Calculated F Value	Remark at 5% level
		Sum of squares	Mean square variation		
Educational	Between Groups	0.029	.014	0.048	NS
Awareness	Within groups	35.171	.301		
Economic	Between Groups	0.115	.058	0.632	NS
Status	Within groups	10.685	.091		
Social	Between Groups	1.621	.810	1.750	NS
Participation	Within groups	54.171	.463		
Social	Between Groups	0.395	.198	0.470	NS
Inclusion	Within groups	49.196	.420		
Social	Between Groups	1.772	.886	1.644	NS
Support	Within groups	63.028	.539		
Physical	Between Groups	0.089	.045	0.142	NS
Health	Within groups	36.702	.314		
Mental Health	Between Groups	13.028	.048	0.434	NS
	Within groups	13.125	.111		

(At 5% level of significance the table value of F is 2.68)

It is inferred from the above table that the salt pan workers whose Educational Qualification are not significantly different with Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health.

Null Hypothesis 16

There is no significant difference among salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Participation, Social

Inclusion, Social Support, Physical Health and Mental Health with reference to Type of House.

Table 4.17

Difference among salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Type of House

Dimensions	Source of variation	df =2, 117		Calculated F Value	Remark at 5% level
		Sum of squares	Mean square variation		
Educational Awareness	Between Groups	1.224	0.612	2.108	NS
	Within groups	33.976	0.290		
Economic Status	Between Groups	0.195	0.098	1.077	NS
	Within groups	10.605	0.091		
Social Participation	Between Groups	3.447	1.724	3.858	S
	Within groups	52.344	0.447		
Social Inclusion	Between Groups	1.160	0.580	1.401	NS
	Within groups	48.432	0.414		
Social Support	Between Groups	1.167	0.583	1.073	NS
	Within groups	63.633	0.544		
Physical Health	Between Groups	.877	0.438	1.428	NS
	Within groups	35.915	0.307		
Mental Health	Between Groups	.001	0.000	0.003	NS
	Within groups	13.124	0.112		

(At 5% level of significance the table value of F is 2.68)

Duncan test for Type of House

Table 4.18

Mean scores in the dimension: Among salt pan workers with Social Participation with reference to Type of House

Type of House	N	Subset for Alpha = 0.05	
		1	2
Tent	39	1.33	
Thatched	57	1.40	
Concrete	24		1.79

It is inferred from the above table that the salt pan workers having tent, thatched and concrete houses are not significantly different with Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health and significantly different with Social Participation.

Null Hypothesis 17

There is no significant difference among between salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Monthly Income.

Table 4.19

Difference among between salt pan workers in relation to the dimensions, Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Monthly Income

Dimensions	Source of variation	df =3, 116		Calculated F Value	Remark at 5% level
		Sum of squares	Mean square variation		
Educational	Between Groups	0.893	0.298	1.006	NS
Awareness	Within groups	34.307	0.296		
Economic	Between Groups	0.374	0.125	1.387	NS
Status	Within groups	10.800	0.090		
Social	Between Groups	2.848	0.949	0.107	NS
Participation	Within groups	52.943	0.456		
Social	Between Groups	1.095	0.365	0.873	NS
Inclusion	Within groups	48.497	0.418		
Social	Between Groups	0.783	0.261	0.473	NS
Support	Within groups	64.017	0.552		
Physical	Between Groups	1.138	0.379	1.234	NS
Health	Within groups	35.654	0.307		
Mental Health	Between Groups	0.110	0.037	0.327	NS
	Within groups	13.015	0.112		

(At 5% level of significance the table value of F is 2.68)

It is inferred from the above table that the salt pan workers drawing monthly income (RS.5000 & Below, Rs.5001-10000, Rs.1000- 20000 and 20001 & above) are not significantly different with Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health.

Null Hypothesis 18

There is no significant difference among between salt pan workers in relation to the dimensions: Educational Status, Economic Status, Social Inclusion, Social Support,

Physical Health and Mental Health with reference to Number of Children in the Family.

Table 4.20

Difference among between salt pan workers in relation to the dimensions; Educational Status, Economic Status, Social Inclusion, Social Support, Physical Health and Mental Health with reference to Number of Children in the Family

Dimensions	Source of variation	df =3,116		Calculated F Value	Remark at 5% level
		Sum of squares	Mean square variation		
Educational	Between Groups	1.090	0.363	1.235	NS
Awareness	Within groups	34.110	0.294		
Economic	Between Groups	0.058	0.019	0.210	NS
Status	Within groups	10.742	0.093		
Social	Between Groups	0.300	0.100	1.218	NS
Participation	Within groups	55.492	0.478		
Social	Between Groups	1.515	0.505	0.802	NS
Inclusion	Within groups	48.077	0.414		
Social	Between Groups	1.317	0.439	0.802	NS
Support	Within groups	63.483	0.547		
Physical	Between Groups	0.383	0.128	0.407	NS
Health	Within groups	36.408	0.314		
Mental Health	Between Groups	0.287	0.096	0.864	NS
	Within groups	12.838	0.111		

(At 5% level of significance the table value of F is 2.68)

It is inferred from the above table that the salt pan workers having children(1 & 2, 3 & 4, 5 & 6 and 7 & above) are not significantly different with Educational Status, Economic Status, Social Participation, Social Inclusion, Social Support, Physical Health and Mental Health.

4.3 Conclusion

The investigators employed percentage analysis, the critical ratio test and analysis of variance for this study. The statistical techniques utilized are outlined in this chapter. Based on the data analysis, the subsequent chapter presents the findings, recommendations and suggestions for further research. The data have been analyzed and the calculated values are compared with the table values at a 5% level of significance. Hypotheses are either accepted or rejected depending on the calculated values. If the calculated value is lower than the table value, the null hypothesis is accepted; if it is higher, the null hypothesis is rejected. All data are presented in tables with appropriate interpretations provided below each table.

CHAPTER V

FINDINGS, INTERPRETATIONS, RECOMMENDATIONS AND SUGGESTIONS

5.1 INTRODUCTION

This chapter delves into the socio-economic dimensions of salt pan workers in Thoothukudi district, a region synonymous with salt production in India. Salt pan workers often marginalized and subjected to harsh working conditions. It forms the backbone of this labor-intensive industry. Despite their pivotal role in sustaining one of the oldest and most critical trades, their lives are marked by socio-economic vulnerabilities, occupational health hazards and a lack of systemic recognition.

This chapter seeks to provide a comprehensive analysis of the challenges faced by these workers, focusing on their income levels, access to welfare measures, working conditions, and the implications for their overall quality of life. By integrating primary data and secondary insights, the study captures the nuances of their lived experiences, shedding light on the broader dynamics of labor exploitation and economic disparity in rural industrial sectors. Furthermore, the analysis draws attention to gender disparities, as women constitute a significant portion of the workforce yet endure additional layers of discrimination and neglect.

This chapter not only highlights the structural deficiencies in policy implementation but also offers a lens to explore potential interventions for improving the livelihoods of salt pan workers. It underscores the need for sustainable practices and inclusive development strategies that bridge the gap between economic output and worker well-being. Through this inquiry, the chapter aims to contribute to a deeper understanding of labor issues in Thoothukudi's salt industry and to advocate a rights-based

approach to enhancing the lives of these indispensable yet overlooked contributors to India's economy. This chapter presents the summary of the findings, so conclusions drawn from the findings and corresponding recommendations. The findings have been listed along with significant quantitative information.

5.2 TITLE OF THE PROBLEM

“An Analytical Study on Salt Pan Workers in Thoothukudi District”

5.3 FINDINGS

Section–I

Percentage Analysis

1. The level of educational status, economic status, social inclusion is moderate and social support, physical health and mental health of salt pan workers with reference to age is low.
2. The level of educational status, economic status, social inclusion, social support is moderate and physical health and mental health of salt pan workers with reference to type of family is low.
3. The level of educational status, economic status, social inclusion is moderate and social support, physical health and mental health of salt pan workers with reference to marital status is low.
4. The level of educational status, social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to educational qualification is low.
5. The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to nature of residence is low.

6. The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to locality of residence is low.
7. The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to type of house is low.
8. The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to monthly income of family is low.
9. The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to number of children in the family is low.

Section – II

Differential Analysis

10. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to type of family.
11. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, physical health and mental health with reference to marital status.
12. There is significant difference between salt pan workers in relation to the dimensions: social support with reference to marital status.

13. There is no significant difference between salt pan workers in relation to the dimensions: educational status, social inclusion, social support and mental health with reference to nature of residence.
14. There is significant difference between salt pan workers in relation to the dimensions: economic status and physical health with reference to nature of residence.
15. There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to locality of residence.
16. There is significant difference between salt pan workers in relation to the dimension: social participation with reference to locality of residence.

Section – III

Analysis of Variance

17. There is no significant difference among salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to age.
18. There is significant difference among salt pan workers in relation to the dimension: social support with reference to age.
19. There is no significant difference among salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social participation, social support, physical health and mental health with reference to educational qualification.
20. There is no significant difference among salt pan workers in relation to the dimensions: educational status, economic status, social

inclusion, social support, physical health and mental health with reference to type of house.

21. There is significant difference among salt pan workers in relation to the dimension: social participation with reference to type of house.
22. There is no significant difference among salt pan workers in relation to the dimensions: educational status, economic status, social participation, social inclusion, social support, physical health and mental health with reference to monthly income.
23. There is no significant difference among salt pan workers in relation to the dimensions: educational status, economic status, social participation, social inclusion, social support, physical health and mental health with reference to number of children in the family.

5.4 INTERPRETATIONS

Section–I

Percentage Analysis

HYPOTHESIS: 1

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to age is moderate.

FINDINGS: 1

The level of educational status, economic status, social inclusion is moderate and social support, physical health and mental health of salt pan workers with reference to age is low.

DISCUSSION:

Salt pan workers in Thoothukudi district face significant challenges in terms of social support, physical health and mental health when age is considered as a critical factor. The physically demanding nature of their work, prolonged exposure to harsh environmental conditions and limited access to

healthcare exacerbate physical health issues. Old age workers due to age-related vulnerabilities the experience a heightened impact on their physical health leading to decreased productivity and increased fatigue.

Social support networks, which are vital for coping with occupational stress, are often weak among these workers due to socio-economic constraints and isolation from broader community networks. The interplay of low social support and poor physical health contributes to mental health challenges including anxiety and depression. These issues are particularly pronounced in older workers who may feel marginalized and less resilient in addressing these compounded adversities and highlighting the urgent need for targeted interventions.

HYPOTHESIS: 2

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to type of family is moderate.

FINDINGS:2

The level of educational status, economic status, social inclusion, social support is moderate and physical health and mental health of salt pan workers with reference to type of family is low.

DISCUSSION:

Salt pan workers often experience poor physical and mental health and the type of family they belong to plays an important role in this. Workers from nuclear families may lack extended family support which can make it harder to manage the physical and emotional stress of their demanding jobs. Without a broader support system, these workers often face challenges like limited help with household responsibilities and emotional support during tough times.

On the other hand, those from joint families might share resources and responsibilities, but they can also face additional pressures, such as financial strain from supporting more family members. The lack of proper healthcare, combined with the daily challenges of working in harsh conditions, further worsens their physical health. Over time, this can lead to mental health issues like stress, anxiety, and depression. Improving family support systems and providing access to healthcare can help improve their overall well-being.

HYPOTHESIS: 3

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to marital status is moderate.

FINDINGS: 3

The level of educational status, economic status, social inclusion is moderate and social support, physical health and mental health of salt pan workers with reference to marital status is low.

DISCUSSION:

Salt pan workers in Thoothukudi district face low levels of social support, physical health and mental health, which are influenced by their marital status. Married workers often experience financial responsibilities to support their families which can increase their stress levels. Balancing demanding work conditions with family obligations leaves little time for rest or self-care, further affecting their physical and mental health.

Unmarried workers on the other hand may lack emotional and social support from a partner, making it harder to cope with the harsh realities of their work environment. This absence of a close support system can lead to feelings of loneliness and mental health challenges like stress and anxiety. Overall, the lack of proper healthcare access, coupled with social and

economic pressures significantly affects the well-being of salt pan workers, regardless of their marital status. Providing better support systems and healthcare can help address these issues.

HYPOTHESIS: 4

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to educational qualification is moderate.

FINDINGS: 4

The level of educational status, social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to educational qualification is low.

DISCUSSION:

The economic status, social support, physical health, and mental health of salt pan workers in Thoothukudi district are closely linked to their educational qualifications and these factors are generally low. Many workers have limited or no formal education which affects their ability to access better job opportunities or negotiate fair wages, keeping their economic status poor. Low income also limits their ability to afford proper healthcare or improve their living conditions.

With limited education, workers may lack awareness of health risks or the importance of preventive care, leading to declining physical health. Social support is often minimal as they may not have access to networks or resources that could help them improve their situation. These combined challenges take a toll on their mental health, causing stress, anxiety and feelings of helplessness. Providing educational opportunities and raising awareness about health and social resources could significantly improve their overall well-being.

HYPOTHESIS: 5

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to nature of residence is moderate.

FINDINGS: 5

The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to nature of residence is low

DISCUSSION:

The economic status, social support, physical health and mental health of salt pan workers in Thoothukudi district are significantly influenced by their nature of residence and are generally low. Workers living in remote or poorly developed areas often lack access to basic amenities like clean water, proper sanitation, and healthcare facilities. This impacts their physical health, leading to issues like exhaustion and illnesses caused by harsh working and living conditions.

Social support is also limited for those in isolated areas, as they may not have close-knit communities or access to resources that provide emotional or financial assistance. These challenges, combined with low wages, keep their economic status poor, leaving them unable to improve their living conditions. Over time, the stress of managing these difficulties without adequate support takes a toll on their mental health, leading to anxiety and depression. Improving housing and access to essential services can greatly enhance their quality of life.

HYPOTHESIS: 6

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to locality of residence is moderate.

FINDINGS: 6

The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to locality of residence is low.

DISCUSSION:

The economic status, social support, physical health and mental health of salt pan workers in Thoothukudi district are strongly influenced by the locality of their residence and are generally low. Workers living in rural or remote localities often face a lack of basic facilities such as healthcare, transportation and proper housing. This impacts their physical health, as they are more vulnerable to illnesses and have limited access to medical care.

In these areas, social support systems are often weak due to the scattered population, making it harder for workers to rely on community help during tough times. Urban localities while offering better access to resources, often come with their own challenges, such as higher living costs, which strain their already low economic status. These combined struggles contribute to mental health issues, including stress and anxiety. Improving living conditions and ensuring better access to essential services can help improve their well-being.

HYPOTHESIS: 7

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to type of house is moderate.

FINDINGS: 7

The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to type of house is low.

DISCUSSION:

The economic status, social support, physical health and mental health of salt pan workers in Thoothukudi district are closely linked to the type of house they live in and are generally low. Many workers live in poorly constructed and temporary houses which offer little protection from extreme weather conditions. This affects their physical health leading to illnesses caused by exposure to heat and rain.

Workers in such housing often face economic challenges, as their low income makes it difficult to afford better living conditions or maintain their homes. The lack of secure housing also reduces social support; as temporary or inadequate homes may limit opportunities for building strong community connections. These challenges contribute to mental health issues; stress and anxiety, as workers struggle to balance work demands with the hardships of poor living conditions. Providing access to affordable and durable housing can greatly improve their quality of life.

HYPOTHESIS: 8

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to monthly income of family is moderate.

FINDINGS: 8

The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to monthly income of family is low.

DISCUSSION:

The economic status, social support, physical health, and mental health of salt pan workers in Thoothukudi district are significantly affected by their family's monthly income, which is generally low. With limited income, families struggle to meet basic needs like nutritious food, healthcare, and

education. This directly affects the workers' physical health, as poor nutrition and lack of medical care make them more vulnerable to illnesses.

Low monthly income also impacts social support. Families with financial struggles often prioritize survival needs, leaving little time or resources to build and maintain strong community connections. The constant worry about meeting expenses creates stress and anxiety, leading to mental health issues over time. Workers feel trapped in a cycle of poverty, with limited opportunities for improvement. Providing fair wages, financial support programs, and access to affordable healthcare can help improve their living standards and overall well-being.

HYPOTHESIS: 9

The level of educational status, economic status, social inclusion, social support, physical health and mental health of salt pan workers with reference to number of children in the family is moderate.

FINDINGS: 9

The level of educational status and social inclusion is moderate and economic status, social support, physical health and mental health of salt pan workers with reference to number of children in the family is low.

DISCUSSION:

The economic status, social support, physical health, and mental health of salt pan workers in Thoothukudi district are influenced by the number of children in their families and are generally low. Families with more children often face greater financial strain, as their limited income must cover food, education, and healthcare for everyone. This leaves little room for savings or addressing unexpected expenses, keeping their economic status poor.

The pressure of providing for a larger family also affects the workers' physical health, as they often push themselves harder to meet their responsibilities, leading to exhaustion and illness. Social support may also be

limited, as time and resources are primarily focused on family needs, leaving little opportunity to engage with the community. These financial and physical pressures can cause significant mental stress, leading to anxiety and feelings of helplessness. Providing family welfare programs and better wages can help ease these burdens and improve their well-being.

Section – II

Differential Analysis

HYPOTHESIS: 11

There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to marital status.

FINDINGS: 12

There is significant difference between salt pan workers in relation to the dimensions: social support with reference to marital status.

DISCUSSION:

The analysis reveals a significant difference in the level of social support experienced by salt pan workers based on their marital status. This suggests that marital status plays a meaningful role in influencing the extent of social support received by individuals in this occupational group. Married workers may benefit from more consistent emotional and instrumental support, possibly due to the presence of a spouse while unmarried workers might experience comparatively lower levels of support. These findings highlight the importance of considering marital status, when assessing the well-being and social conditions of salt pan workers. Tailored social interventions and support systems could be developed to address the disparities identified, particularly focusing on the more vulnerable groups lacking strong social networks. This insight underscores the need for holistic approaches to improve quality of life among salt pan workers.

HYPOTHESIS: 12

There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to nature of residence.

FINDINGS: 14

There is significant difference between salt pan workers in relation to the dimensions: economic status and physical health with reference to nature of residence.

DISCUSSION:

The study highlights a significant difference in economic status and physical health among salt pan workers based on their nature of residence, with those living in owned houses reporting better outcomes than those in rented or temporary accommodations. Ownership of a house often reflects greater economic stability, providing a sense of security and reducing the financial burden associated with paying rent. This stability enables better allocation of resources toward health maintenance, nutrition, and other essential needs, positively influencing physical well-being.

Furthermore, living in owned houses may offer a more stable and hygienic environment, reducing exposure to stressors and health risks common in less permanent housing conditions. In contrast, rented or temporary housing may signify economic vulnerability, which can exacerbate physical health challenges due to inadequate living conditions and limited access to healthcare. These findings underscore the interplay between housing stability, economic security, and physical health, emphasizing the need for targeted support to improve living conditions for economically disadvantaged workers.

HYPOTHESIS: 13

There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to locality of residence.

FINDINGS: 16

There is significant difference between salt pan workers in relation to the dimension: social participation with reference to locality of residence.

DISCUSSION:

The findings indicate a significant difference in social participation among salt pan workers based on their locality of residence, with those residing in villages exhibiting higher levels of social participation than their city-dwelling counterparts. This disparity can be attributed to the strong community ties and collective culture prevalent in rural areas, where individuals often engage in shared activities, cultural events, and local gatherings. Village environments inherently promote interconnectedness and mutual support, which fosters active participation in social activities.

In contrast, urban settings often prioritize individualism, and the fast-paced lifestyle of city dwellers may limit opportunities for communal interaction. Additionally, urban environments can be characterized by greater anonymity and less cohesive community structures, leading to reduced social participation. These findings highlight the influence of environmental and cultural factors on social engagement, suggesting that interventions aimed at enhancing social participation in urban areas should focus on fostering community cohesion and providing structured opportunities for interaction.

Section – III

Analysis of Variance

HYPOTHESIS: 14

There is no significant difference among salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to age.

FINDINGS: 18

There is significant difference among salt pan workers in relation to the dimension: social support with reference to age.

DISCUSSION:

The study reveals a significant difference in social support among salt pan workers based on age with individuals aged 36 and above receiving more social support than younger age groups. This disparity can be attributed to the stronger social networks and community ties that often develop over time. Old aged individuals may have established deeper relationships within their families, peer groups and communities which naturally translate into higher levels of emotional and practical support.

Societal norms in many cultures prioritize care giving and support for older individuals, further enhancing their access to assistance. Younger workers might still be in the process of building their social networks and may not have the same level of familial or communal engagement. These findings emphasize the importance of age as a factor influencing social support and highlight the need to develop initiatives to strengthen social connections and support systems for younger salt pan workers.

HYPOTHESIS: 16

There is no significant difference between salt pan workers in relation to the dimensions: educational status, economic status, social inclusion, social support, physical health and mental health with reference to type of house.

FINDINGS:21

There is significant difference among salt pan workers in relation to the dimension: social participation with reference to type of house

DISCUSSION:

The study identifies a significant difference in social participation among salt pan workers based on the type of house they reside in, with those living in concrete houses demonstrating better social participation than their counterparts in non-concrete dwellings. Concrete houses often symbolize greater economic stability and a sense of permanence which can foster stronger community engagement and participation in social activities.

Living in a durable and secure environment may reduce stress and enhance confidence, enabling individuals to interact more actively within their social networks. In contrast, workers residing in temporary or less stable housing may face financial and psychological constraints that limit their ability to engage in communal events or activities. These findings suggest that the quality and stability of housing can significantly influence social behavior, underscoring the need for policies and programs to improve housing conditions and thereby promote social inclusion among salt pan workers.

5.5 RECOMMENDATIONS

Recommendations for Government Authorities:

- Implement welfare schemes to improve the economic status of salt pan workers including subsidies, financial aid and housing assistance.
- Enhance access to affordable healthcare services to address physical and mental health concerns.
- Provide skill development programs to increase employability and boost income levels.

- Initiate adult education programs to improve the educational status of salt pan workers.
- Facilitate community development programs to promote social inclusion and support.
- Establish cooperatives to enhance collective bargaining power for better wages and working conditions.
- Develop affordable housing schemes to provide secure and durable housing.
- Launch awareness campaigns about the importance of health and well-being.
- Promote family welfare programs to address challenges related to family size and dependencies.
- Create job opportunities in local areas to reduce migration and ensure better living standards.

Recommendations for Educational Institutions:

- Conduct outreach programs to educate salt pan workers and their families about the benefits of education.
- Offer flexible learning programs and evening classes tailored to the needs of working adults.
- Provide scholarships or financial assistance to children of salt pan workers to ensure continuing education.
- Integrate life skills and health education into curricula for salt pan workers and their families.
- Organize awareness campaigns on the importance of literacy and skill development.
- Collaborate with NGOs and government agencies to provide learning resources and infrastructure.
- Establish community learning centers in salt pan areas to enhance

educational access.

- Promote vocational training programs that align with the economic needs of salt pan workers.
- Create mentorship programs to guide children of salt pan workers in their academic pursuits.
- Develop educational programs focusing on social inclusion and community engagement.

Recommendations for NGOs:

- Facilitate health camps to address physical and mental health issues among salt pan workers.
- Provide microfinance options to enhance economic stability and self-employment opportunities.
- Organize support groups to foster social inclusion and build social support networks.
- Collaborate with government agencies to implement housing and welfare schemes.
- Conduct awareness drives about workers' rights, healthcare, and education.
- Develop training programs focused on financial literacy and income generation.
- Offer nutritional support programs to improve the health and well-being of workers and their families.
- Create platforms for community interaction to strengthen social ties.
- Advocate for policy changes to improve living and working conditions in salt pan areas.
- Collaborate with educational institutions to promote lifelong learning initiatives.

Recommendations for Parents:

- Encourage children to pursue education and provide a supportive learning environment at home.
- Utilize available government schemes for education and healthcare to improve family welfare.
- Promote healthy living habits to improve physical and mental well-being.
- Participate in community development programs to foster social inclusion.
- Invest in vocational training opportunities for family members to enhance earning potential.
- Engage with NGOs and local authorities to address housing and economic challenges.
- Strengthen family bonds to create a supportive environment for all members.
- Monitor children's academic progress and provide motivation for higher education.
- Advocate for improving living conditions and access to basic facilities.
- Actively participate in health and awareness programs organized by the community.

Recommendations for Teachers:

- Identify and support children from salt pan worker families who may face educational challenges.
- Design inclusive learning strategies to accommodate the needs of students from diverse backgrounds.
- Encourage peer-to-peer learning to foster a sense of belonging and inclusion.
- Provide career counseling and guidance to help students plan their future paths.

- Conduct parent-teacher meetings to discuss students' progress and provide educational advice.
- Organize extracurricular activities to build confidence and social skills.
- Promote health awareness through school programs targeting both students and parents.
- Collaborate with NGOs and local authorities to provide learning materials and resources.
- Integrate community issues into educational content to make learning relevant and meaningful.
- Advocate for scholarships and financial aid for deserving students.

5.6 SUGGESTIONS FOR FURTHER RESEARCH

- The present study focused on salt pan workers in Thoothukudi district. Further research could explore the working conditions and well-being of salt pan workers in other districts or states to provide a comparative analysis.
- A study could be conducted on the role of local governance in improving the economic status and housing conditions of salt pan workers.
- Further research could examine the impact of climate change on the livelihood and health of salt pan workers, particularly in coastal regions.
- A study could be undertaken to evaluate the effectiveness of existing welfare schemes for salt pan workers and identify areas for improvement.
- Research could be conducted on the intergenerational impact of salt pan work, focusing on education and career prospects for workers' children.
- A study could explore the psychological impact of occupational

hazards faced by salt pan workers and the role of mental health interventions.

- Further research could investigate gender disparities among salt pan workers, analyzing differences in economic status, social support, and health outcomes.
- A study could assess the role of non-governmental organizations in supporting the social and economic inclusion of salt pan workers.
- Research could be carried out on the use of technology and mechanization in salt pans and its impact on workers' productivity and health.
- A longitudinal study could be conducted to track changes in the quality of life of salt pan workers over time in response to policy interventions.

5.7CONCLUSION

The study entitled "An Analytical Study on Salt Pan Workers in Thoothukudi District" provides critical insights into the socio-economic and health dimensions of this vulnerable workforce. The findings reveal that while the level of educational status and social inclusion is consistently moderate across various demographic and socio-economic categories, the overall well-being of salt pan workers remains significantly low in terms of economic status, social support, physical health and mental health.

Younger workers those in nuclear families, unmarried individuals, and those with lower educational qualifications exhibit lower levels of social support and health outcomes. Workers living in rented or non-concrete houses, rural or urban localities and families with lower monthly income or more dependents face pronounced economic challenges and

poor health indicators. These findings underscore the multifaceted challenges faced by salt pan workers, including inadequate healthcare access, limited financial stability and insufficient support networks. The moderate levels of education and social inclusion highlight some progress but also indicate the need for targeted interventions to address the persisting gaps. Efforts by government authorities, educational institutions, NGOs and community leaders are essential to improve the living conditions, health and socio-economic status of salt pan workers, ensuring a more equitable and sustainable future for this marginalized group.

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AN ANALYTICAL STUDY ON SALT PAN WORKERS IN THOOTHUKUDI DISTRICT

RESEARCH TOOL

Personal Data

1. Age : 18 -21 / 22-30 / 31-35/
36&above
2. Type of Family : Joint/ Nuclear
3. Marital Status : Married/ Unmarried
4. Education : Illiterate / Elementary Level/
Secondary Level / Hr. Sec. Level
5. Nature of Residence : Owned House/ Rented House
6. Locality of Residence : Village / City
7. Type of House : Tent / Thatched / Concrete
8. Monthly Income of Family : Rs.5000&below/Rs.5001-10,000
/Rs.10,001-20,000/ Rs.20,001&above
9. Number of Children
in the Family : 1 &2/ 3 &4/ 5&6/ 7& above

AN ANALYTICAL STUDY ON SALT PAN WORKERS IN THOOTHUKUDI DISTRICT

I EDUCATIONAL STATUS			
1	Do you think education is necessary for workers?	Yes	No
2	Do you encourage your children to pursue education?	Yes	No
3	Do you believe education will help improve workers' lives?	Yes	No
4	Do you support education for younger generations?	Yes	No
5	Do you believe literacy is important for personal development?	Yes	No
II ECONOMIC STATUS			
6	Is your income sufficient to meet your basic needs?	Yes	No
7	Do you have any savings?	Yes	No
8	Do you face difficulties in meeting household expenses?	Yes	No
9	Do you rely on loans or credit for daily needs?	Yes	No
10	Do you have any additional sources of income?	Yes	No
III SOCIAL PARTICIPATION			
11	Do you participate in community activities?	Yes	No
12	Do you take part in social events and celebrations?	Yes	No
13	Do you involve yourself in labour union activities?	Yes	No
14	Do you attend public meetings or gatherings?	Yes	No
15	Do you support social welfare programs in your area?	Yes	No
IV SOCIAL INCLUSION			
16	Do you feel included in society?	Yes	No
17	Do you experience discrimination in your workplace?	Yes	No
18	Do you feel respected in social and public spaces?	Yes	No

19	Do you participate in decision-making processes in your community?	Yes	No
20	Do you think society values the education of workers?	Yes	No
V SOCIAL SUPPORT			
21	Do you receive any financial assistance from the government?	Yes	No
22	Do you have access to financial aid for emergencies?	Yes	No
23	Do social workers or NGOs provide you with any support?	Yes	No
24	Do you receive assistance from social welfare organizations?	Yes	No
25	Do government offices provide adequate guidance and help for your needs?	Yes	No
VI PHYSICAL HEALTH			
26	Do you take necessary precautions for your health at work?	Yes	No
27	Have you experienced any health issues due to your work?	Yes	No
28	Do you get medical check-ups when required?	Yes	No
29	Do you feel physically exhausted from your daily work?	Yes	No
30	Do you have access to proper healthcare facilities?	Yes	No
VII MENTAL HEALTH			
31	Do you experience stress due to work or financial issues?	Yes	No
32	Do you feel anxious or depressed frequently?	Yes	No
33	Do you find it difficult to manage work and personal life?	Yes	No
34	Do you have access to mental health support services?	Yes	No
35	Do you feel emotionally stable in your daily life?	Yes	No

BEYOND THE WHITE CRYSTALS: LIFE AND LABOUR IN THE SALT PANS





BEYOND THE WHITE CRYSTALS: LIFE AND LABOUR IN THE SALT PANS

