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Environmental health status of fishermen in Mahe district

Saravanabavan V and Abeesh P

Abstract

The study focuses on the importance of the micro-level and spatial distribution of fishermen activity and analyzes the interrelationship between environment and health of fishermen. Living environmental and health conditions play a vital role in the fishermen population. The study area Mahe is one of the smallest districts in India and the smallest district in the Union territory of Puducherry. It lies approximately between 11°41' North and 11°46' North latitudes and 75°31' East and 75°54' East longitude on the west coast in Kerala. The main objectives are -To analyze the different types of health factors that affect the fishermen-To detect the ward of fishermen and identify the living environment and health condition through Z score analysis technique. The collected information includes both primary and secondary sources obtained from the respective offices. The primary data is in the form of a sample questionnaire survey in the selected wards of the study area. The primary data is collected in the fishermen household units and fishermen working area. The data collected were taken by using the method of stratified random sampling and a total of 300 samples were collected from the study area. Standardized score ('Z' Score) technique of scale transformation is used to analyze the factors of socio-economic and health. Arc GIS is used to digitize the map. The purpose of the study is to investigate the living environment and health condition of fishermen in Mahe.

Keywords: Fishermen – Environmental Health – Spatial distribution – Z score techniques -GIS

1. Introduction

Health is the level of functional or metabolic efficiency of a living being. In humans, it is the general condition of a person's mind, body, and spirit, usually meaning to be free from illness, injury or pain [1, 2, 3, 4, 5]. Health geography views health from a holistic perspective encompassing society and space, and it conceptualizes the role of place, location and geography in health, well-being and disease and deals with the aspects of health status and health care systems [6, 7, 8, 9]. It aims to improve the understanding of the various factors which affect the health of populations and hence individuals. Health geographers use modern spatial analysis tools to map the diffusion of various diseases, as individuals spread them amongst themselves, and across wider spaces as they migrate [10, 11, 12, 13]. Health geographers also consider all types of spaces as presenting health risks, from natural disasters, to interpersonal violence, stress and other potential dangers [14, 15, 16, 17, 18].

Health is one of the important components in the socio-economic development of any region or area and its promotion and protection is essential to sustained economic and social development. [19, 20, 21, 22]. In resource-dependent communities such as fishing communities, human health underpins the ability of individuals and families to maintain viable livelihoods [23, 24]. Fishing is a dangerous occupation, in which fishers are exposed to health risks both on and off-shore. Many of these risks and associated health concerns also extend to fishing families and wider communities [25, 26]. Despite the importance of health, there is a lack of understanding of the breadth of health issues affecting people associated with fishing.

Health is affected by economic, social, political, and behavioral circumstances [27, 28, 29, 30]. The impacts of ill health are impacted by the self-employed nature of most fishers [31], who are often remunerated on a catch share basis and may fall through the gaps of social security systems [32], the unpredictable and high fixed costs of fishing, among other factors, mean that fishers tend to prioritize opportunities to fish over health [33].

The living environmental condition of the fishers has a significant role in the conservation of bio-resources. Fisheries contribute significantly to India's national economy and provide a livelihood to an estimated 10 million people.

This present study of research contribution concerns the living environmental and health status of fishermen in Mahe district. The study focused on the importance of micro-level and spatial distribution of fishermen activity and to analyze the interrelationship between socio-economic and health of fishermen.

Health issues related to fishing also extend beyond individual fishers to the wider fishing industry, fishing families, and fishing communities [34]. Fishing businesses often incorporate family members; thus, the health of these families is important for maintaining viable fishing communities [35]. While good health underpins the ability of people to contribute towards a sustainable fishery, fishers often experience poor health and are exposed to a variety of occupational hazards [36]. Poor health has important implications for social integrity, economic viability, and

environmental sustainability of fisheries. In physically demanding occupations such as fisheries, health is a key asset underpinning productivity.

2. Study Area

Mahe district is one of the four districts of the Union Territory of Puducherry which is situated 653 Km away from Puducherry (Fig.1). It is the smallest district with a total geographical area of 9 Sq. km lying in the armpits of Kannur and Kozhikode districts of Kerala. It lies approximately between 11°41' North and 11°46' North latitudes and 75°31'

East and 75°54' East longitude on the west coast in Kerala. It is bounded by Kannur district on the north, Kozhikode on the south, Kannur and Kozhikode on the east and Arabian Sea on the west.

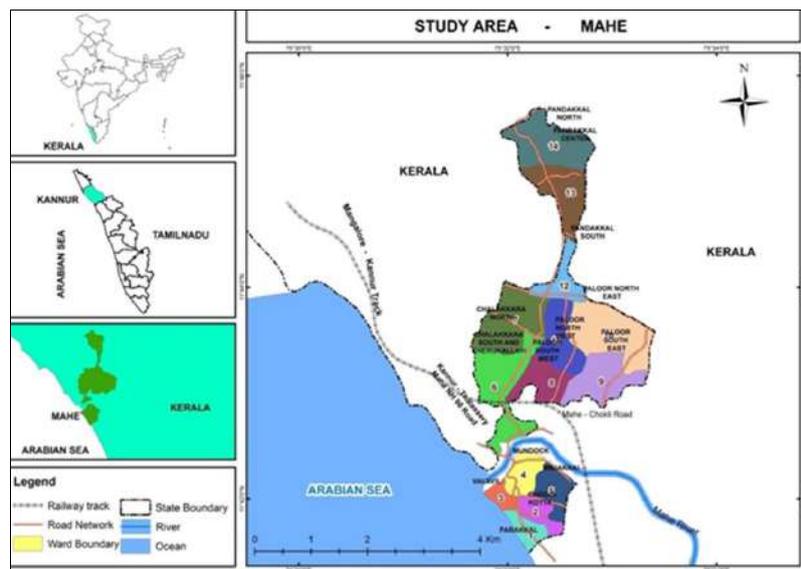


Fig 1: Location of Study area

3. Objectives

- To analyze the different living environment of fishermen.
- To observe the occupational pattern and occupational health issues of the fishermen.
- To detect the ward of fishermen and identify living environment and health condition through Z score analysis techniques

4. Methodology

4.1. Source of data and sampling

The collected information includes both primary and secondary sources obtained from the respective offices. The primary data is in the form of a sample questionnaire survey in the selected ward of the study area. The data collected were taken by using the method of stratified random sampling and a total of 300 samples were collected from the study area.

The Secondary data have been collected from the Department of Fisheries department, Health department, Revenue Department. Mahe profile was collected from the Taluk office of Mahe. The maps are prepared using GIS (Geographic Information System). Graphical techniques and suitable statistical techniques were used to analyze the data relating to living environment and Health factors.

4.2. Tools and techniques

Standardized score ('Z' Score) technique is are the methods of scale transformation used to analyze the factors of socio-economic and health. A Z-Score is a statistical measurement of a score's relationship to the mean in a group of scores. A Z-score of 0 means the score is the same as the mean. A Z-score can be positive or negative, indicating whether it is above or below the mean and by how many standard deviations.

A standardized normal distribution (so that it has a mean of 0 and an SD of 1) is called the standard normal distribution, or the normal distribution of z-scores. If we know the mean μ ("mu"), and standard deviation σ ("sigma") of a set of scores which are normally distributed, we can standardize each "raw" score, x , by converting it into a z score by using the following formula on each score:

$$z = \frac{x - \mu}{\sigma}$$

5. Results and Discussion

The identification of the health condition of fishermen in Mahe can lead one to associated factors of physical, social environment, and cultural. The environmental health includes physical, mental and social and it stresses the importance of the role of environmental health both in terms

of physical and social environments. The health condition of the fishermen of Mahe face a lot of problems due to environmental, cultural and political issues. The present study area analyses the health condition of fish workers in Mahe. It also depicts the surrounding environmental issues and how they affect the health of fishermen workers. Various factors like disease, pollution, food, hygiene, hospital facility, usage of medicine are the major measurements of the health condition of fishermen. The physical health issues are the prominent factors of the health condition of fishermen in Mahe. The studies addresses physical health issues such as viral fever, Musculoskeletal and eye issues. The fishermen normally live in the narrow strip of land which is crowded without proper waste management facilities that lead to health issues. Due to the low income of the family, they do not

have sufficient basic facilities in their houses which also affect the health of fishermen. The studies show that fishermen have a high level of cataract disorder, viral fever, Headache, Knee pain, Dengue Fever, Skin infection, and Musculoskeletal disease. The majority of it are is caused by external risk factors such as diet, tobacco, alcohol and high level of physical activity at work. Risk factors linked to physical work load are very common prolonged standing, working in awkward position pushing and pulling and carrying loads involve repeated hands and arm movement. The variety of tasks involved in fishing vesels including fish catching and manipulating gear, equipment and loads lead to postural deviation, repetition, and forceful exertions. Also, the movement of the vessel is known to contribute to the strain on the workers [37].

Table 1: Fisher men Health Problems in ward wise Incidence -2019

Ward Number	Ward Name	“Z” Score Value					
		Headache	Viral Fever	Dengue	Knee Pain	Skin Disease	Eye
1	Parakkal	-0.19	-0.85	-0.46	1.55	0.26	0.72
2	Choodikotta	0.62	1.07	-0.46	0.23	0.94	-0.54
3	Valavil	0.10	0.03	-0.46	-0.22	0.48	0.65
4	Mundock	-0.53	0.47	2.31	-0.94	-0.66	2.45
5	Manjakkal	0.00	0.00	0.00	0.00	0.00	0.00
6	Chalakarra	0.00	0.00	0.00	0.00	0.00	0.00
7	Chalakarra North	-0.53	0.90	1.39	-0.22	2.28	-0.54
8	Paloor South West	-0.53	1.79	-0.46	-0.94	-0.66	-0.54
9	Paloor South East	2.63	-0.85	-0.46	-0.94	-0.66	-0.54
10	Paloor North West	-0.53	-0.85	-0.46	1.21	-0.66	-0.54
11	Paloor North East	0.00	0.00	0.00	0.00	0.00	0.00
12	Pandakkal South	-0.53	-0.85	-0.46	-0.94	-0.66	-0.54
13	Pandakkal Centre	0.00	0.00	0.00	0.00	0.00	0.00
14	Pandakkal North	-0.53	-0.85	-0.46	1.21	-0.66	-0.54

5.1. Headache

Headache is one of the most common medical diseases which affect fishermen. The reasons being skipped meals, over strain, changes in fishing time, alcohol particularly, over sun heat in fishing time and fish selling time [38]. Figure no 1 shows that the number of affected persons is highly

concentrated in paloor south west (2.63), Pandakkal north (-0.53) Coastal ward of Mahe like Parakkal, valavil, show the Z score value of (-0.19) and (0.62) respectively. Stress, over tension and heavy sun heat are the major reasons for the headache in fishermen workers. Remaining wards represent (-0.50) of the Z score Value. (Fig 2)

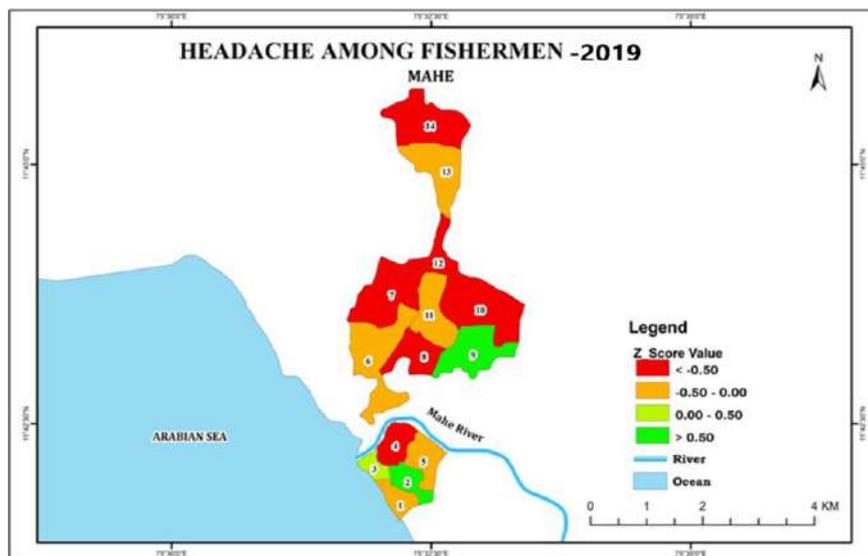


Fig 2: ‘Z’ Score value of incidence of viral fever in Mahi Fishermen

5.2. Viral Fever

Viral fever refers to a broad spectrum of conditions where

viral infections are associated with elevations of body temperature [39]. The term encompasses a wide variety of

viral infections, some of which can be identified by their symptoms and signs. These viral infections may show generalized symptoms but may target specific organs. Table 1 shows the spatial distribution of viral fever in fishermen workers. The Viral fever is most common in areas where

houses are closely attached. The Z score values of Parakkal (0.85), Valavil (0.03) Choodikotta (0.07). Paloor west ward reported a high level of viral fever which shows (1.79). The remaining wards have has an effective low rate of viral fever. It shows the Z score Value (-0.05). (Fig 3)

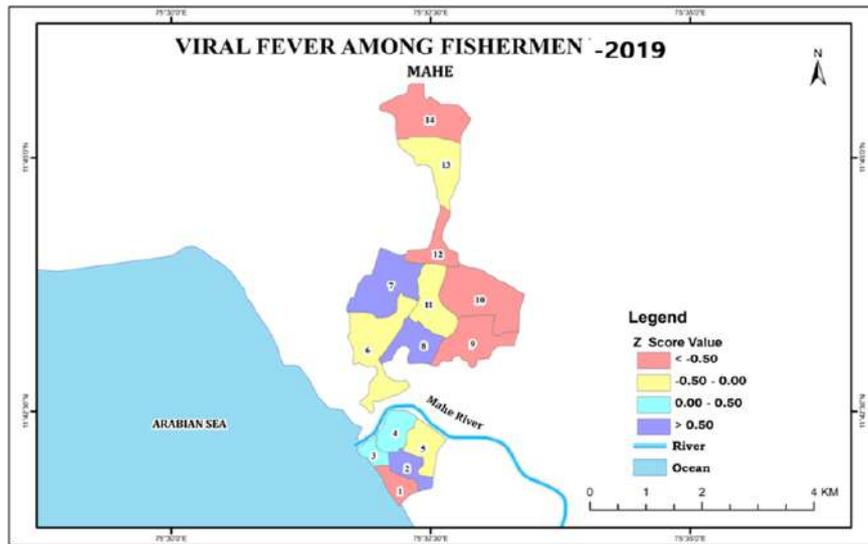


Fig 3: 'Z' Score value of incidence of viral fever in Mahi Fishermen

5.3. Dengue

Dengue is a fast emerging pandemic-prone viral disease in many parts of the world. Dengue flourishes in urban poor areas, suburbs and countryside but also affects more affluent neighborhoods in tropical and subtropical countries [40]. Table 1 shows the dengue disease of the respondents. High

rate of Dengue is seen in Mundock ward and cherukallayi ward (2.31) and (1.39) respectively. Stagnant water is the main reason for spreading of dengue in this area. Remaining wards show lowest rate of dengue as in Parakkal, Valavil, Choodikotta, pandakkal south (-0.46) of the Z score Value. (Fig: 4)

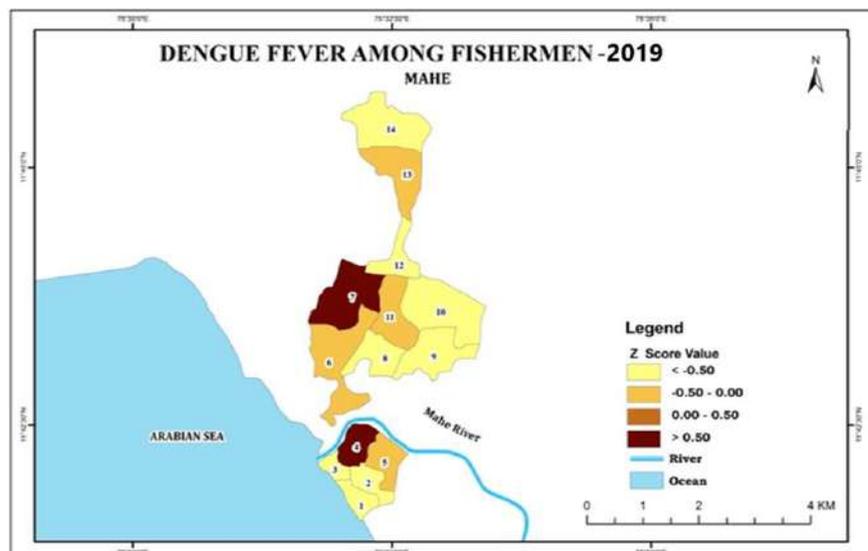


Fig 4: 'Z' Score value of incidence of Dengue fever in Mahi Fishermen Workers

5.4. Knee Pain

Musculoskeletal Disorders or MSDs are injuries and disorders that affect the human body's movement or musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, discs, blood vessels, etc) [41]. WHO recognizes that musculoskeletal health conditions contribute greatly to disability across the life-course in all regions of the world? In particular, the WHO recognizes that musculoskeletal Score value.

conditions significantly impact functional ability. Table 1 shows the Knee disorders of the fishermen in Mahe. High rate of Knee disease is seen in Parakkal (1.64), valavil (1.55) and paloor North West (1.21) of the Z score value. (Fig: 5) High-level physical activity work is commonly associated with musculoskeletal disorder. Over Weight lifting, pushing and pulling of the boat are the main reasons for this disease. Other wards represent (0.94) Z

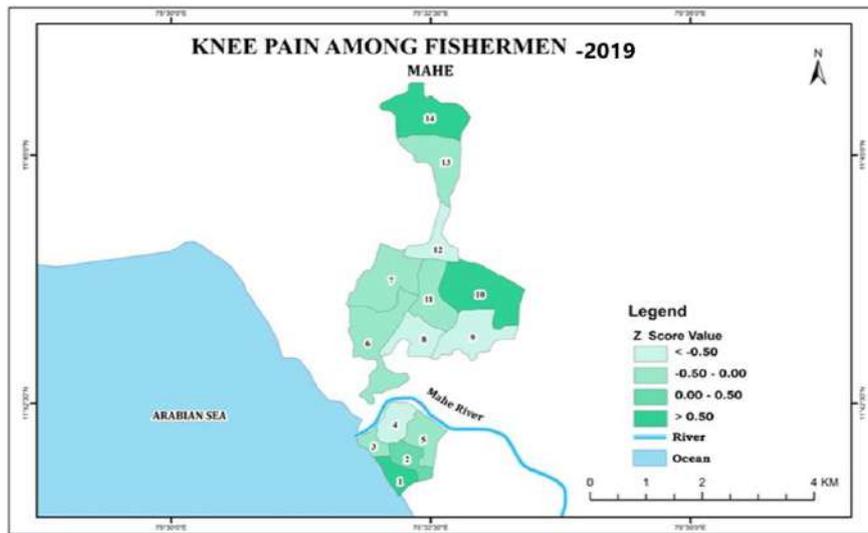


Fig 5: 'Z' Score value of incidence of Knee pain in Mahi Fishermen Workers

5.5. Skin Disease

Skin infection is most common in fishermen workers. Skin infections are commonly caused by bacteria that live on the skin without causing harm, but which can cause infections like boils and abscesses if they enter the body through broken skin [42]. Skin bacteria can spread between people. This occurs more readily where there is crowding, close physical contact, poor personal hygiene, uncovered wounds and sharing of personal items. Less commonly, skin infections are caused by bacteria found in fish and marine. From table 1, skin disease is most common in coastal area ward of Mahe which represent Parakkal (0.26), Valavil (0.48), Choodikotta (0.74) the Z score Value. A common reason for these diseases is caused by contaminated water in the harbor and some micro bacteria in the fishnet. Due to the fact that fishermen spend a long period with their legs immersed in water for loading and unloading of fish in the harbor, they develops skin infection. The remaining wards show the negative rate value which represent (-0.66) Z score

Value. (Fig: 6)

5.6. Eye Disorder

Table shows the eye disorder of fishermen in Mahe. Parakkal, Valavil, Choodikotta have a high rate of eye disorder. Because most of the workers are engaged with the fish catching activities [43]. Eyes become reddish due to the saline water. Parakkal (0.72) Valavil (0.65) Choodikotta (0.82) have the Z score Value. Other wards represent (-0.59).

6. Hospital Treatment

Govt hospitals in Mundock and Pandakkal Southward which represent (1.24) of Z score value recorded the highest PHC and Govt hospital are nearby to these wards. In outer Mahe, most of the workers prefer Thalassery private hospital that gives good facilities. The Pallor south west, Paloor north east Pandakkal North represent (1.17) of Z score value. (Fig: 7)

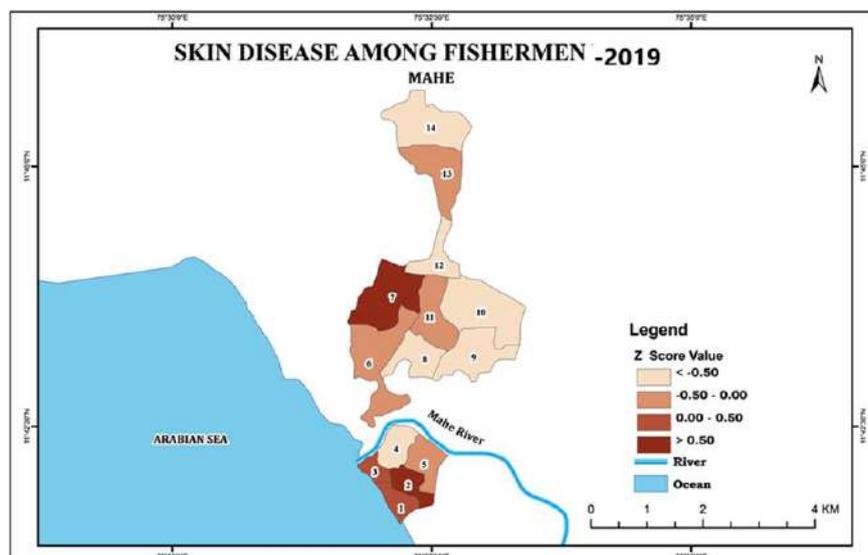


Fig 6: 'Z' Score value of incidence of Skin disease in Mahi Fishermen

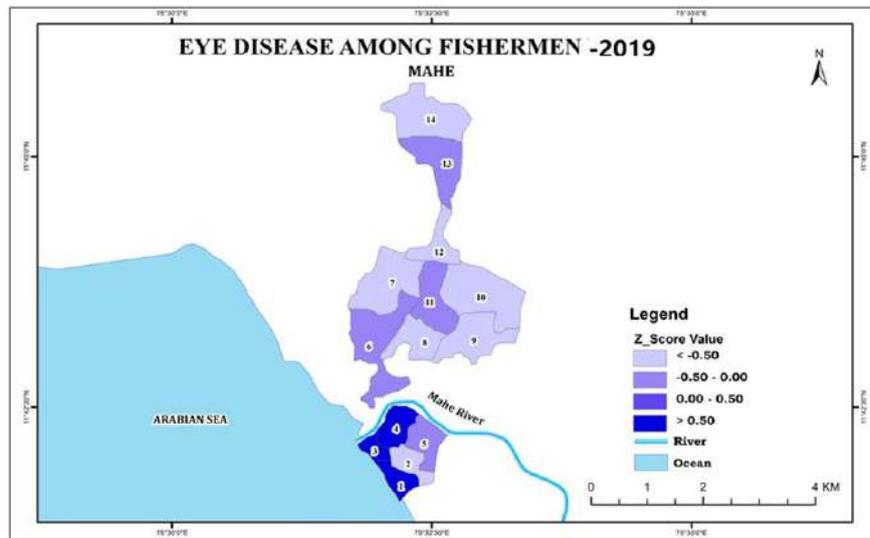


Fig 7: 'Z' Score value of incidence of Kye disease in Mahi Fishermen

7. Conclusion

Health is common theme in all nations of the world. Health has evolved over the centuries as a concept of concern from an individual to a worldwide social goal and encompasses the whole quality of life. The health condition of fishermen is very much in risk when compared to other primary workers. Main diseases found in them are Head ache, Viral fever, Dengue, Skin infection, Muscoskeleton disorder, Eye disease. These diseases are due to direct communication with sea water, Sun heat and extreme weather conditions. Body pain and knee pain are due to handling loads and weight. Fishing work needs much muscular work that affect the total body balance. Solid waste management is poor in the area and in most of the places waste are deposited in the sea or nearby land. A lot of changes have to be taken in their respect.

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