



## Knowledge, Awareness, and Perception (KAP): A Study on Environmental Pollution of Coastal Villages in Kanyakumari District

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### ABSTRACT

*Through one's own knowledge, awareness and perception people come to know about everything in their fingertips. One of such knowledge, awareness and perceptions are environment pollution and its impact on human beings, flora and fauna. Environmental Pollution is the introduction of toxic and chemical substances into the air, water, soil causing serious problems to the health of humans and ecosystem. Human sustainability of this earth depends on the level of pollution. It badly affects the social and economic life of human beings. Therefore this paper aims to tell the readers and policy makers about environment pollution and how it affects the poor people particularly the fishermen in Kanyakumari District. Results from 225 sample respondents indicate the sample respondents have given high mean score for water pollution, plastic pollution and Air pollution with its score of value of 3.74, 3.72 and 3.70 with S.D value of 1.407, 1.329 and 1.384 respectively. Due to these pollutants the respondents are susceptible to diseases like Cancer, Immune deficiency and Skin irritations with its mean value of 3.18, 2.97 and 2.72 respectively. This paper too offer a few suggestions to the government and well wishers of fishermen to take control of this situation and save the life of millions and millions of the people in the world. Otherwise we create our comforts at the risk of our future generation and in the coming days they would curse us irrespective of wealth we leave behind. Hence it is a major issue to be attended immediately.*

**Key words:** Knowledge; Awareness; perception; environmental pollution & Diseases

### INTRODUCTION

Knowledge, Awareness and Perception are the three key dimensions which decide about the understanding of what is happening in and around human persons. The knowledge triggers the mind of human being to probe questions like why, what, where and how, while the awareness gives understanding about environs and its functioning. As a result the perception of human being is formed and it becomes the way of life. One of such knowledge, awareness and perception is environmental pollution. The ever increasing pollution of the environment has been the greatest concerns of science and the general public in the last 50 years. The rapid industrialization of

agriculture expansion of the chemical industry and the need to generate cheap forms of energy has caused the continuous release of man-made organic chemicals into the natural ecosystems. As a result the exposure to atmospheric pollutants produces a board spectrum of health hazards especially for the poor. Hence environment pollution is one of the most important topics of the day. Today throughout the globe men of all profession talk about environment pollution whenever they speak or write. So it is the urgent problem and the need of the hour because it affects 80 per cent of rural population of our country. Especially fishermen who are socially and economically very poor and who stands the lowest



rung of the social ladder are not exempted to this. They tend to be fragile to this issue and easily prone to many environmental related diseases even though fish food provides proteins, vitamins, fat, and minerals. Hence environmental pollutions are the major challenge which will undoubtedly dominate the economic and social agenda of many countries including India.

## STATEMENT OF THE PROBLEM

Ocean space has been used by mankind from the beginning of civilization as a source of food and tools and also as an area of commerce, colonization and warfare. Due to various man made activities such as lumbering, mining, clearing agricultural lands, industrialization and urbanization, dredging of harbor channels and estuaries the ocean is polluted to the greater extent. It is estimated that Indian Ocean receives annually  $34 \times 10^8$  tonnes of suspended sediment of which about  $16 \times 10^8$  tonnes come from rivers flowing through the sub-continent. Beside this dissolved salts of heavy metals are being carried by our water streams to ocean and sea surrounding us. As a result the productivity of water depletes the fishery resources. This in turn results in number of harmful effects to the people who consume fish as food. Particularly it brings havoc to the coastal population and the life of 14.47 million of fisherfolk who solely depend the ocean for their livelihood easy victimized to this menace. As a result they are susceptible to both communicable and non-communicable diseases. At this juncture few question arise in the mind of the researcher like what are the factors contributing the environment pollution, what extent the sample respondents have knowledge, awareness and perception regarding pollution in their living areas, Whether the age and occupation are the important factor with regard to understanding of environment

pollution. To find fitting answers to the aforesaid questions the research problem is undertaken.

## OBJECTIVES OF THE STUDY

The general objective of the study is to measure the knowledge, awareness and perception of pollution in the coastal villages. The following are the specific objectives.

- To find out the knowledge, awareness and perception of sample respondents regarding various kinds of pollution.
- To measure the level of knowledge, awareness and perception about pollution in the study area.
- To discuss the various diseases that affect the respondents due to environmental pollution

## HYPOTHESES

Ho<sub>1</sub>: There is no significant difference among age group with respect to awareness about pollution.

Ho<sub>2</sub>: There is no association between nature of work and level of awareness about pollution.

Ho<sub>3</sub>: The opinion regarding awareness about pollution is equal to average level.

Ho<sub>4</sub>: There is no significant difference in the level of awareness about pollution among the respondents

Ho<sub>5</sub>: The opinion regarding factors affecting pollution is equal to average level.

## METHODOLOGY

This study is based on both Primary and Secondary data. The primary data were collected from the three coastal taluks (i.e. Agaestharam, Kalkulam, Vilavancode) in Kanyakumari District wherein the coastal belt is located. These belts consist of 47 villages and from each taluk two villages were selected for this study: one with the

highest population while the other village with the lowest population. From each taluk, 75 sample respondents were selected. Out of which 50 sample respondents were from the village of highest population and 25 sample respondents from the village of lowest population on the basis of multistage random sampling. The selected villages are Kanyakumari (H) and Siluvaiyanager (L) of Agasthishwaram taluk, Colachel (H) and Chinnavalai (L) of Kalkulam taluk, Neerodi (H) and Helen Colony (L) of Vilavancode taluk. Further, from these six villages 225 samples are chosen on

the basis of proportionate stratified random sampling. The collected data had been analyzed with the help of the statistical tools like percentage analysis, one way ANOVA, one sample t-test, chi-square and Chi-square for Goodness of Fit. The secondary data were collected from various books, journals and websites.

(H) Indicates the village with the highest population in the taluk and (L) indicates the village with the lowest population in the taluk. The following map clearly depicts the sample coastal villages in Kanyakumari district.



**FIG. 1**  
**LOCATION OF SAMPLE VILLAGES**

## RESULTS AND DISCUSSION

Age is one of the decisive factors which decide about the knowledge, awareness and perception of the sample respondents in the study area. The following hypothesis is proved with the help of one way ANOVA

Ho<sub>1</sub>: There is no significant difference among age group with respect to awareness about pollution.

**TABLE -1**  
**AGE WITH AWARENESS ABOUT POLLUTION**

Particular	Age group in Years				
	Age	Mean	S.D	F-Value	Sig
Awareness about Pollution	Below 25	48.89	11.201	3.655	0.01**
	25-35	46.61	11.173		
	36-45	43.99	11.109		
	Above 45	41.16	12.592		
	Total	45.04	11.641		

Source: Computed data

Note: \*\* denote 1 per cent significant level

Since, p value is less than 0.05, the null hypothesis is rejected at 1% level of significance. Hence it is concluded that there is significant difference among age group with respect to knowledge, awareness and perception about pollution. It is inferred that the age group below 25 has a greater knowledge, awareness and perception about pollution. It is due to the awareness programme conducted by the schools, colleges, NGOs and Government with regard to impact of pollution and climatic change. At the same time the level of knowledge, awareness and perception regarding environment pollution for the age group of above 36 onwards is very poor. It is due to the ignorance and illiteracy of the sample respondents in the study area. The following table clearly depicts the awareness, knowledge and perception with regard to nature of work with the following hypothesis.

Ho<sub>2</sub>: There is no association between nature of work and level of awareness about pollution.

**TABLE 2**  
**NATURE OF WORK WITH AWARENESS ABOUT POLLUTION**

Nature of Work	Level of awareness about pollution			Total	Chi-square Value	P-Value
	Unaware	Aware	Highly Aware			
Fishing	50 (26.5%) [84.7%]	88 (46.6%) [80.0%]	51 (27.0%) [91.1%]	189	3.417	0.181
Non- Fishing	9 (25.0%) [15.3%]	22 (61.1%) [20.0%]	5 (13.9%) [8.9%]	36		
<b>Total</b>	59	110	56	225		



## Source: Computed data

**Note:** 1.The value written in ( ) refers to Row percentage

2. The value written in [ ] refers to Column percentage

Since p value is greater than 0.05, the null hypothesis is accepted at 5 per cent level of significance. Hence it is concluded that there is no association between nature of work with awareness, knowledge and perception level on pollution with the chi-square value of 3.417. Based on row percentage in fishing, 26.5 per cent of the respondents are unaware of the pollution, 46.6 per cent of the respondents are aware of the pollution, 27 per cent of the respondents are highly aware of the pollution. For non-fishing, 25 per cent of the respondents are unaware of the pollution, 61.1 per cent of the respondents are aware of the pollution, 13.9 per cent of the respondents are highly aware of the pollution. It is inferred from the previous studies conducted by Frantzeskou E, et al. (2014) that awareness of fishermen regarding the risk for developing chronic diseases forces them to quit the profession due to permanent incapacity. It is inferred that whether their occupation is fishing or non fishing nearly 166 sample respondents are aware of the pollution in the study area.

The following table clearly depicts about the knowledge, awareness and perception of the sample respondents with regard to various pollutants in the study area.

H<sub>03</sub>: The Opinion regarding to awareness about pollution are not equal to average level.

**TABLE-3**

### KNOWLEDGE, AWARENESS AND PERCEPTION ABOUT POLLUTION

S.No	Types of pollution	Mean	S.D	t-value	p-value
1	Water pollution	3.74	1.407	7.865	<0.001**
2	Air Pollution	3.70	1.384	7.611	<0.001**
3	Marine Pollution	3.62	1.186	7.813	<0.001**
4	Noise pollution	3.01	1.400	0.143	0.887
5	Plastic pollution	3.72	1.329	8.129	<0.001**
6	Light pollution	2.21	1.245	9.532	<0.001**
7	Soil pollution	3.34	1.434	3.580	<0.001**
8	Thermal pollution	1.94	1.106	14.340	<0.001**
9	Metal pollution	1.72	1.020	18.764	<0.001**
10	Nuclear waste	3.05	1.596	0.460	0.646
11	Electronic waste	2.26	1.378	8.082	<0.001**
12	Agricultural pollution	2.05	1.042	13.623	<0.001**
13	Arsenic pollution	1.82	1.147	15.397	<0.001**
14	Vehicular pollution	3.27	1.428	2.849	<0.005
15	Fire crackers pollution	3.20	1.297	2.365	<.019*
16	Hospital pollution	2.37	1.367	6.927	<0.000

## Source: Computed data

**Note:** \*\*Significant at one per cent level

\* Significant at five per cent level



Out of 16 types of pollution the sample respondents have given high mean score for water pollution, plastic pollution and Air pollution with its score of value of 3.74, 3.72 3.70 with S.D value of 1.407,1.329 and 1.384respectively. Since, p value is less than 0.01, the null hypothesis is rejected at 1 per cent level of significance with regard to knowledge, awareness and perception about pollution. Hence, it is concluded that the opinion regarding to awareness about pollution are not equal to average level.

Based on the mean score, pollution like Light pollution, Thermal pollution, Metal pollution, Electronic waste, Agricultural pollution, Arsenic pollution, Hospital pollution are below the average score. It shows that people in the coastal area are unaware of this pollution. The reason is that the people are not highly educated in these areas. Hence knowledge, awareness and perception about the aforesaid pollution in the study area are very poor. Various researchers state that all the pollution pollute the sea water to the maximum, due to the use of industrial machinery, transport and people's ambition to own the most technological advanced equipment is the catalyst behind pollution. Especially Marine pollution occurs when harmful, or potentially harmful, effects result from the entry into the ocean of chemicals, particles, industrial, agricultural and residential waste, noise, or the spread of invasive organisms. The following table measures the level of awareness of the sample respondents with the help of chi-square goodness of fit test.

$H_{04}$ : There is no significant difference in the level of awareness about pollution among the respondents

**TABLE -4**  
**LEVEL OF AWARENESS ABOUT POLLUTION**

Level of Awareness	No. of Respondents	Percentage	Chi-Square	p-value
Unaware	59	26.2	24.560	< 0.001**
Aware	110	48.9		
Highly Aware	56	24.9		

**Source: Computed data**

**Note:** \*\* indicate significant at 1% level

Since P-value is less than 0.01, the null hypothesis is rejected at 1 % level of significance. Hence, it is concluded that the level of awareness about pollution of people in Kanyakumari District is good and they aware the pollution like water, air, plastic, soil etc. It is due to awareness campaign conducted by NGOs and the programmes are given by All India Radio. Besides this the educational institutions offer environmental studies at undergraduate programme in the colleges. It is also noted that the respondents are aware of the plastic pollution because one of the collectors of Kanyakumari district instilled the awareness among the people that how the litters harm the people and its repercussion in the near future. Hence the awareness levels of the respondents are praise worthy.

Environment problems arise to any risk or injury caused to a person due to exposure to a particular pollutant present in any component of environment – air, water, or soil or even in the food items is called

as an environmental disease. The following table clearly depicts about the environmental related diseases due to pollution.

Ho<sub>5</sub>: The opinion regarding factors affecting pollution is equal to average level.

**TABLE 5**  
**ENVIRONMENT RELATED DISEASES**

S. No.	Environment related diseases	Mean	S.D	t-value	p-value
1	Asthma/wheezing	2.68	1.446	3.273	<0.001**
2	Cancer	3.18	1.487	1.838	0.067
3	Birth defects	2.62	1.406	4.030	<0.001**
4	Skin irritations	2.72	1.274	3.348	<0.001**
5	Miscarriage/premature death	2.33	1.225	8.165	<0.001**
6	Heart disease	2.59	1.290	4.807	<0.001**
7	Immune deficiency	2.97	1.328	0.352	0.726
8	Respiratory	2.52	1.373	5.293	<0.001**
9	Gastrointestinal	2.50	1.337	5.586	<0.001**
10	Memory loss	2.33	1.309	7.638	<0.001**
11	Dermatitis	1.74	.899	20.986	<0.001**
12	Impaired hearing	1.78	1.036	-17.635	<0.001**

**Source: Computed data**

**Note:**\*\*Significant at one per cent level

Since, p value is less than 0.01, the null hypothesis is rejected at 1 per cent level of significance with regard to factors affecting pollution. Hence it is concluded that the opinion regarding factors affecting pollution is not equal to average level. Out of Twelve variables regarding Non Communicable diseases (NCD) the respondents have given highest score for Cancer, Immune deficiency and Skin irritations with the value of 3, 18, 2.97 and 2.72 respectively. It is inferred that the study conducted by Padua JC and Basil Rose MR (2013) show that the coastal villages in Kanyakumari expose high degree of radioactivity in coastal villages. As a result many fisherfolk are susceptible to cancer in the study area. Other

study conducted by Maharajan and Kirubakaran Samuel (2010) that exposure to hazardous environment include biological agents viz., micro-organisms such as bacteria, viruses and parasites which contribute to the global burden of infectious disease, chemical pollutants, ultra violet radiation and the like which cause birth defects and damage the body immunity system and which render people susceptible to a variety of health risks and facing the problem likes in diseases, eye irritation, deafness, allergy, unhygienic condition respiratory problems, still births, birth defects, and hormonally dependent Cancers such as breast, testicular, and prostate cancers. The study conducted by Frantzeskou E, et al.(2014) shows



that fishermen have a higher mortality from cardiovascular diseases, cancer and accidents. The study conducted by Sahayaselvi(2015) shows that average fishermen in the study area spent for medication more than 10,000 per annum irrespective of their low income. A recent WHO points out that over 20, 00,000 children worldwide suffers from environmental hazards. As a result the gravest effects of all attacks on the environment are suffered by the poorest.

## FINDINGS

- Since, p value is less than 0.05, the null hypothesis is rejected at 1% level of significance. Hence it is concluded that there is significant difference among age group with respect to knowledge, awareness and perception about pollution.
- There is no association between nature of work with awareness, knowledge and perception level on pollution with the chi-square value of 3.417. Based on row percentage in fishing, 26.5 per cent of the respondents are unaware of the pollution, 46.6 per cent of the respondents are aware of the pollution, 27 per cent of the respondents are highly aware of the pollution.
- Out of 16 types of pollution the sample respondents have given high mean score for water pollution, plastic pollution and Air pollution with its score of value of 3.74, 3.72 3.70 with S.D value of 1.407,1.329 and 1.384 respectively. Since, p value is less than 0.01, the null hypothesis is rejected at 1 per cent level of significance with regard to knowledge, awareness and perception about pollution.
- Since P-value is less than 0.01, the null hypothesis is rejected at 1 % level of

significance. Hence, it is concluded that the level of awareness about pollution of people in Kanyakumari District is good and they aware the pollution like water, air, plastic, soil etc. It is due to awareness campaign conducted by NGOs and the programmes are given by All India Radio.

- Out of Twelve variables regarding Non Communicable diseases (NCD) the respondents given highest score for Cancer, Immune deficiency and Skin irritations with the value of 3, 18, 2.97 and 2.72 respectively

## SUGGESTIONS

- The Government can teach environmental education to the general public which in turn creates environmental consciousness to the people.
- The environment law of our country should be strictly adhered and a special force can be set up to monitor and control the same from selfish people who pollute the environs
- The Government can conduct an awareness campaign on the pollution like Light pollution, Thermal pollution, Metal pollution, Electronic waste, Agricultural pollution, Arsenic pollution and Hospital pollution, so that the people in general may have sound and judgemental knowledge about pollution and they try to protect themselves from all this menace.
- Government should create a policy like education of environment to all. So that every citizens of our country may aware of the pollution and take necessary measures and not to pollute the environs.
- The Health care department can display the notice board in public places that contains



all the diseases arising out of pollution which is a threat to all the polluters who contaminate the earth and sea.

- The producer and manufacture should realise their social responsibility by creating eco friendly products and thereby reducing the pollution.

## CONCLUSION

With an advancement of Science and Technology new types of industries come with new materials to make our life more comfortable but at the same time give more pollution unless appropriate measures are taken by both Central and State Government. Otherwise the Human sustainability would be in danger and they may be prone to many new diseases due to changing ecological conditions in the sphere. This results in creating our comforts at the risk of our future generation. Hence the environmental pollution should be addressed as earlier as possible. Otherwise the people who are weak in the socio-economic conditions might be washed off like Tsumani-2004. The policy makers who are the Centre and State need to be highly cautious in protecting the welfare of fishermen community who are so much exposed to marine pollution directly. If they not do so all the welfare schemes would be just an eye wash and hence these global problems are needed to be met immediately, without delaying further.

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