Awareness of Industrialization impact on Environment – a Case Study of Paradip Port Trust (PPT)

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Abstract:

Industrialization decreases unemployment but it causes a dangerous problem called pollution which affects the complete environment and the living organisms. Industrial pollution is dangerous for not only its employees and also for the residents living in neighbourhoods. Industrialization makes the people comfortable but health issues and the lives of future generations will be dangerous. People should face a lot of problems related to health, climatic changes. An increase in industrialization at one point makes the human survival critical on this earth. Ports also face the industrialization problem in and around the port areas. It also effects the Paradip Port area, more industries are established at Paradip lead to an increase in the pollution levels causing so many health issues to the residents residing at Paradip. So, here the researcher took one factor that "Industrialization and Awareness about Environment in Paradip Port Trust (PPT) area" with 16 statements and collect the opinions from the 336 public persons who are from surrounding areas of PPT. He analyzed it with some demographic factors by using regression analysis.

Keywords: Industrialization, Paradip Port Trust (PPT), Pollution.

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1. INTRODUCTION:

Due to the industrialization requirement of labour increased and the average standard of living for workers also increased and the financial status will be good. They can afford a good education for their children but the availability of the best schools depends on the authorities of those areas. Availability of the good education standards makes the children learn and be responsible for society. They can learn more about the environment and will be concerned about the environment. Neglecting the environmental issues and going for urbanization and industrialization leads to irreparable damage to both humans and the environment. Due to industrialization air,

water, soil, and living organisms are affected. Industrialization made people are getting modern and sophisticated things available at their doorstep which makes them comfortable and happy. Even though climatic changes due to pollution are observed they are finding alternatives to protect themselves in that situation without thinking of any future complications. Due to pollution, there is a lot of impact on climate, no rains, high temperatures, drought-like conditions, etc. Decrease in rains making humans depend only on the groundwater, now the groundwater level is decreased to an alarming rate so it is essential to preserve the rainwater by proper harvesting techniques.

Ports also face the industrialization problem in and around the port areas. The main problem is air pollution. Industries release emissions into the air which are toxic and cause serious illness in the living organisms. Ports face the challenge of maintaining water quality. Activities such as boat repair, transportation, terminal operations, cargo handling, and storage all have a potential impact on water quality. Due to changes in water quality, marine habitats can't survive and they move to other habitats. Leachate is a toxin that gathers in the bottom of landfills and leaks into earth causing a risk to living organisms.

2. INDUSTRIALIZATION EFFECT ON THE ENVIRONMENT:

The industrialization has brought economic prosperity, urbanization, and stress on the basic life-supporting systems. Air pollution, water pollution, soil contamination, and habitat destruction are the environmental issues observed due to industrialization. Now the environmental pollution is at an alarming rate where every individual needs to take initiatives to conserve the environment. Due to pollution, the ecological cycle is disturbed, affecting the living organisms and leading to the extinction of many species. Deforestation causes an increase in temperature as well as no space for other living organisms that live on trees. An increase in temperature makes the environment not suitable for living organisms to live. Industries release ozone-depleting substances like chlorofluorocarbons which deplete the ozone layer due to which the UV and IR rays directly fall on the earth affecting the trees as well as human beings. Due to industrialization more greenhouse gases are released into the air causing global warming and increasing the earth's normal temperature

3. INDUSTRIALIZATION EFFECT ON PARADIP PORT TRUST ENVIRONMENT:

Due to port activities, industrial activities the pollution at the Paradip has reached a critical level and the residents are facing various health problems. Apart from industrial wastage, a lot of waste is getting accumulated in those areas because of the increase in hotels. The government is trying to control the pollution by imposing fines on the industries, hotels, etc. but the actions taken are not strict enough and the same activities getting repeated and the pollution levels are increasing at Paradip. Increase in the pollution levels causing various health problems to the residents at Paradip which making them visit doctors continuously, children are missing the schools and elderly people are more prone to diseases. Even though people are interested to enjoy good standards of living, the situations prevailing at Paradip are not supportive. Accumulated waste will be drifted or carried through the wind to the neighbouring areas leading to more pollution.

Here the researcher takes the industrialization effects on the environment and its awareness to the public particularly in the Paradip Port Trust area and reviews it with related literature in the following sections.

4. REVIEW OF LITERATURE:

Paradip is situated uniquely of twelve Odisha Industrialized Areas. Much of Odisha's large-scale factories are bright[3]. Both sectors in Paradip stand comprehensive and category red. Paradip area is a natural home of fauna & flora. Nadiya Chand Kanungo (2013)[4] said "This area of biodiversity has been affected by the large-scale destruction of mangrove forests and vulnerable environmental conditions caused primarily by rapid industrialization."

"The survival of his fish and olive ridley has also been adversely impacted by industrialization. The Paradip Port area is the place where horseshoe crabs mating and nest. A rare species of frogs named F.cancrivora are also seen in this area. If adequate

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[3] *Industries carrying out activities viz., Port, Fertilizer, Vegetable Oils, Oil Refinery, Iron and Steel and Carbon are identified as red-category by the Forest and Environment Department*, Government of Orissa, (Reference – No. 6194/Env.I – 40/2007/F&E, Dt. 24th April 2007).

[4] Nadiya Chand Kanungo, *POSCO: Ecological Disaster in Coastal Orissa*, 2006,
http://www.cpiml.org/liberation/year_2006/January/posco_orissa.htm (last visited May 20, 2013).

safety measures for the survival of these creatures are not taken then they are exposed to industrial pollution."[5]

K.O. Konhauser (1997)[6] "Few factories contribute tremendous amounts of wastewater or agricultural effluent polluting the Mahanadi River at the Atharbanki Creek confluence."

Fertilizer industry extracts (Paradip Phosphates Limited) in the form of gypsum waste threat (calcium sulphate), are stored in the gypsum pool. Gypsum pond management needs to be performed correctly or the negative effects would affect stakeholder lives. When heavy dumping happens, the polluted water brings to a large degree pollutes the water source (Manipadma Jena 2008)[7].

The amount of Suspended Particulate Material (SPM) here is very troubling and beyond the defined requirement since a significant quantity of container dust in the port area is widespread (K. Venugopala Rao, 2000)[8]. So the industry's at Paradip raises questions about their commitment to society and the environment.

Adil Najam et al., (2014)[9] listed that "Industrial activity took a steady leap these days. Commonly the industry degrading the environment."

Sayre, D. (1996)[10] said that "Achieving high environmental performance is possible when an environmental management system is in place and allows the development, implementation, coordination, and monitoring of activities with environmental impact, to reach two objectives: compliance with standards and reduced waste".

[5] Vibhu Sinha & Ateet Vatan Bahmani, *A study on industrial growth along coast line of Orissa and its undesirable effect on environment using GIS - an olive ridley (sea turtle) perspec*tive.

[6] K.O. Konhauser, *Trace Element Geochemistry of River Sediment*, Orissa State, India, 193, Journal of Hydrology 258 -269 (1997).

[7] Manipadma Jena, *Pollution in the Mahanadi: Urban Sewage, Industrial Effluents and Biomedical Waste*, Economic and Political Weekly, 88- 93 (2008).

[8] K. Venugopala Rao., *Environmental Degradation in Major Ports of India*, 57(3) International Journal of Environmental Studies 339 (2000).

[9] Adil Najam, David Runnalls and Mark Halle, International Institute for Sustainable Development Environment and Globalization Five Propositions, http://www.unep.org/gc/gc24/docs/FivePropositions.pdf (last visited Jun 25, 2014).

[10] Sayre, D., *Inside ISO 14001: the competitive advantage of environmental management,* St. Lucie Press, Delray, 1996.

Konar, S. et al, (2001)[11] expressed that "Based on economic and statistically significant results, have shown that a low level of environmental performance has a significant negative effect on the intangible assets of Fortune 500 companies. The ranked 15 companies based on environmental enactment and established that high levels of environmental performance and acquiescence with environmental principles lead to improved environmental reporting and the acceptance of pollution prevention actions".

Chris Wooldridge, et al., (2014)[12] expressed that, "The adoption of Environmental Performance Indicators (EPIs) may profit the port authorities by monitoring actual progress, representing the level of developments overtime to which environmental goals are being accomplished".

According to Nasrin Asgari, et al., (2014)[13], "The economic and social dimensions intend to enhance the operations by improving cost-effectiveness besides the working environments in the supply chain."

Juan Ramón García Vizcaíno, et al., (2014)[14] emphasized that "Adopt the green ports' strategies and suitable practices of 'climate change adaptation and mitigation', 'eco-friendly and sustainability issues' from existing ports and their efficiency and economic potential should be used as illustrations for other ports."

C.A. Schipper, et al, (2017)[15] explained that "KPIs have the huge significance that ports all over the world develop and implement a standard set of KPIs to evaluate and improve port operations, social welfare, wealth and sustainability."

Assunta Di Vaio, et al, (2018)[16] emphasized that "It has been recommended to develop and authorize other useful managerial KPIs that emphasis on other procedures within energy effectiveness and environmental sustainability problems in the ports and

[11] Konar, S., Kohen, M.A., *Does the market value environmental performance?*, The Review of Economics and Statistics, 83(2), pp. 281-289, 2001.
[12] Chris Wooldridge, MartíPuig and Rosa Mari Darbra, *Identification and selection of Environmental Performance Indicators for sustainable port development*, Marine Pollution Bulletin, Elsevier, 2014.
[13] Nasrin Asgari, Ashkan Hassani, Dylan Jones, and Hoang Huy Nguyen, *Sustainability Ranking of the UK Major Ports:* Methodology and Case Study, 2015.
[14] Juan Ramón García Vizcaíno, Daan Rijks, Tiedo Vellinga, and Jamie Lescinski, *A sustainable approach to port development construction*, Conference Paper, https://www.researchgate.net/publication/283894272, 2014.
[15] C.A. Schipper, H. Vreugdenhil, M.P.C. de Jong, *A sustainability assessment of ports and port-city plans: Comparing ambitions with achievements*, Transportation Research Part D 57, pp. 84–111,2017.
[16] Assunta Di Vaio, Luisa Varriale, Federico Alvino, *Key performance indicators for developing environmentally sustainable and energy efficient ports: Evidence from Italy*, Energy Policy 122, pp. 229–240, 2018.

considering various other stakeholders and promote to authorize these KPIs in other countries to exemplify their specificities."

Xavier, et al, (2016)[17] emphasized that "Options available to support port authorities and other stakeholders with the formation, execution, and enhancement of a reliable Environmental Management System (EMS) are Identification and assessment tool of environmental aspects in Ports and Eco Ports network."

From the above, all literature review researcher understands the adverse effect of industrialization on environment and the importance and need for environmental sustainability especially in the Ports. So, he decided to study the possibilities through Corporate Environment Responsibility (CER) to maintain environmental sustainability and ecological balance in the Paradip Port Trust (PPT). According to these in the cognizance and its significance, he takes the concept of awareness to the public about the industrialization effects and its eradication methods take up by the Paradip Port Trust. Towards that the researcher developed the below research objectives for the study.

5. OBJECTIVE OF THE STUDY:

- To identify the Industrialization effect on the environment and their impact on Environmental Sustainability in Paradip Port Trust.
- To suggest ways and means to improve the environment in the Paradip Port Trust area.

6. METHODOLOGY:

6.1 Primary data: Total population in Paradip is 68,585. Out of which persons having minimum awareness on environmental impact around 80% of 49786 adult population is 39830 (approximately). Thus, the sample size considered for this study based on the formula i.e., people who participated in the survey are 336.

i) Sample Size Formula:

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[17] Xavier Seguí, Martí Puig, Eugenio Quintieri, Chris Wooldridge, Rosa Mari Darbra, *Environmental performance baseline for inland ports*, A benchmark for the European inland port sector, 2016.

$$n = \frac{\left(\dfrac{P[1-P]}{\dfrac{A^2}{Z^2} + \dfrac{P[1-P]}{N}} \right)}{R}$$

Where:

- n = sample size required
- N = number of people in the population
- P = estimated variance in population, as a decimal: (0.5 for 50-50, 0.3 for 70-30)
- A = Precision desired, expressed as a decimal (i.e., 0.03, 0.05, 0.1 for 3%, 5%, 10%)
- Z = Based on confidence level: 1.96 for 95% confidence, 1.6449 for 90% and 2.5758 for 99%
- R = Estimated Response rate, as a decimal

With a population of 39830 assuming a 90% confidence interval with 5% precision level and with estimated variation in the population assumed 50% (0.5). The response rate observed from the pilot study is 80%. Thus, the sample size obtained from the population is approximately 336 (which was the actual sample size considered for the present study for the General Public questionnaire). The researcher has considered all the categories of the respondents by considering above 18yrs of age respondents by covering both the genders with different marital status. Also, the researcher considered different years of stay in Paradip, different educational backgrounds, different types of respondents (Skilled and Technical) as well as different primary activities of the respondents. The researcher, on completion of the pilot study, has collected the required data using schedule, interview, and observation methods.

ii) *Scoring and Measurement of Variables:* The different items in the Schedule indicate different scale factors i.e. variables relating to both the dependent variable and the intervening variables are provided on a Likert pattern of a 5-point scale. The five response categories together with the numerical values assigned to them for computation purpose are as follows: Strongly Agree/Extremely Aware (5), Agree/Moderately Aware (4), Neutral/Somewhat Aware (3), Disagree/Slightly Aware (2), and Strongly Disagree/Not at all Aware (1). Since the questionnaire used a five-point scale, average scores of 3 and around indicate a moderate tendency on that dimension existing in the organization, and scores around 4 indicate a fairly good degree of that dimension existing in the organization.

iii) *Data Interpretation:* An attempt is made to analyze and understand the perceptions of the sample respondents on the topic. The data were fed to the computer. The

tabulations and the results for analysis were done with the help of SPSS (Statistical Package for Social Sciences) version 18, MINITAB version-17, and Microsoft Excel for Statistical measurements such as simple percentages, percentage scores, mean values standard deviations, etc. Factor analysis is performed to determine the number of structures of the underlying variables among a large number of measures. This is a powerful method of statistical analysis that aims at explaining the relationship among numerous variables in terms of a relatively few underlying factor variates. Factor scores are composite variables that represent the status of factor dimensions.

Regression analysis was carryforward by taking the dependent variables as dimensions related to all the dimensions of all the three questionnaires with the demographic variables (Age, Years of stay in Paradip, Qualification, and Primary Activity). Data is verified with Normal assumptions. The response given by the authorities follows the normal distribution. So, for this data student-tests performed for the demographic variables age and qualification to know the difference in the opinion of the authorities belonging to different age groups as well as different qualifications. For this non-normal data, Kruskal Wallis tests were administered to know the significant difference in response among different categories of the respondents by their respective age group, by their educational background, by their primary activity and by their years of stay at Paradip on all the significant aspects related to the present research based on the significant level (5%) observed from the regression analysis. The significance level is considered 5% (P-value < 0.05) for all the statistical tests.

6.2 Secondary Data: The researcher has collected the information from various published sources about the Corporate Environmental Responsibility in Ports. He collected huge information on Paradip Port Trust from various libraries, internet, Government policies, Acts, etc.

7. DATA ANALYSIS:

Here the researcher analyzes the factor that "Industrialization and Awareness about Environment in Paradip Port Trust (PPT) area" with 16 statements with nine statements and collects the opinions from the 336 public persons who are from surrounding areas

of PPT and analyzed it in the following tables. He also compares the results with demographic factors.

7.1 Industrialization and Awareness about Environment in PPT:

Here the researcher collected the opinions on the different statements of "Industrialization and Awareness about Environment" from sample Public and showed it in the succeeding table.

Table 1: The opinion of the respondents on "Industrialization and Awareness about Environment"

Q. No.	Industrialization and Awareness about the environment	SDA	DA	N	A	SA	Mean	% Score
1.	The quality of the environment at Paradip is better now compared to the environment 5 years ago.	18 (5.4%)	173 (51.5%)	120 (35.7%)	17 (5.1%)	8 (2.4%)	2.5	36.9
2.	The level of awareness in public regarding environmental conditions in Paradip is very good.	6 (1.8%)	18 (5.4%)	41 (12.2%)	208 (61.9%)	63 (18.8%)	3.9	72.6
3.	There is sufficient plantation in Paradip and the greenery level in Paradip is very high.	1 (0.3%)	16 (4.8%)	27 (8%)	176 (52.4%)	116 (34.5%)	4.2	79.0
4.	To combat the unemployment problem, some level of environmental pollution must be accepted.	15 (4.5%)	245 (72.9%)	32 (9.5%)	43 (12.8%)	1 (0.3%)	2.3	32.9
5.	Protecting the environment is less urgent than often suggested.	87 (25.9%)	197 (58.6%)	39 (11.6%)	11 (3.3%)	2 (0.6%)	1.9	23.5
6.	According to you, Paradip is not a critically polluted city.	229 (68.2%)	47 (14%)	29 (8.6%)	20 (6%)	11 (3.3%)	1.6	15.6
7.	You are enjoying a good standard of living in Paradip.	116 (34.5%)	160 (47.6%)	36 (10.7%)	23 (6.8%)	1 (0.3%)	1.9	22.7
8.	PPT and its neighbouring industries are spending enough on their CER.	19 (5.7%)	107 (31.8%)	153 (45.5%)	56 (16.7%)	1 (0.3%)	2.7	43.5
9.	Due to industrialization benefits are more compared to the loss and you are happy with it.	6 (1.8%)	37 (11%)	40 (11.9%)	238 (70.8%)	15 (4.5%)	3.7	66.3
10.	You want more industries to come to Paradip.	4 (1.2%)	22 (6.5%)	35 (10.4%)	198 (58.9%)	77 (22.9%)	4.0	74.0
11.	There is an improvement in the education standards in Paradip due to industrialization.	23 (6.8%)	243 (72.3%)	29 (8.6%)	31 (9.2%)	10 (3%)	2.3	32.3
12.	PPT and State Govt. are taking necessary steps in maintaining the cleanliness in Paradip.	6 (1.8%)	141 (42%)	46 (13.7%)	132 (39.3%)	11 (3.3%)	3.0	50.1
13.	Labour conditions in Paradip are healthy and good.	6 (1.8%)	137 (40.8%)	59 (17.6%)	126 (37.5%)	8 (2.4%)	3.0	49.5

14.	PPT and State Govt. are working sincerely in providing the desired quality of life in Paradip.	12 (3.6%)	69 (20.5%)	140 (41.7%)	110(32.7%)	5 (1.5%)	3.1	52.0
15.	Sufficient rain harvesting structures are made available in Paradip.	8 (2.4%)	252 (75%)	60 (17.9%)	15 (4.5%)	1 (0.3%)	2.3	31.3
16.	You are enjoying a better environment, health, and improved living standards in Paradip.	121 (36%)	139 (41.4%)	35 (10.4%)	38 (11.3%)	3 (0.9%)	2.0	24.9

Analysis of the opinions on the statements:

1. When analyzed among the public residing at Paradip regarding "Quality of the environment at Paradip is better now compared to the environment 5 years ago", 51.5% of the respondents disagree and only 2.4% of the respondents strongly agree. The percentage score of the above statement is 36.9 which indicates most of the respondents are agree with the statement.

2. When analyzed about the statement that "Level of awareness in public regarding environmental conditions in Paradip is very good", more than 3/4th of the total respondents responded positively, 5.4% of the respondents disagree and 1.8% strongly disagree with the above statement. The percentage score of the above statement is 72.6 which indicates most of the respondents agree with the statement.

3. Regarding the statement that "There is sufficient plantation in Paradip and the greenery level in Paradip is very high, 52.4% of the respondents agree, 34.5% of respondents strongly agree and only 4.8% of the respondents disagree with the above statement. The percentage score of the above statement is 79 which indicates most of the respondents are agree with the statement.

4. When analyzed among the public regarding the statement that "To combat with the unemployment problem, some level of environmental pollution must be accepted", 72.9% of the respondents disagree and only 12.8% of the respondents agree. The percentage score of the above statement is 32.9 which means most of the respondents are accepted the statement.

5. Regarding the statement that "Protecting environment is less urgent than often suggested", 58.6% of the respondents disagree, 25.9% of the respondents strongly disagree and only 3.3% of the respondents agree with the above statement. The

percentage score of the above statement is 23.5 which indicates none of the respondents agree with the above statement.

6. When the opinion of employees was considered regarding the statement "Paradip is not a critically polluted city", 68.2% of the respondents strongly disagree and only 3.3% of the total respondents strongly agree. The percentage score of the above statement is 15.6 which indicates almost all the respondents agree with the above statement.

7. When asked the public residing at Paradip whether they are "Enjoying good standard of living in Paradip", more than 3/4th of the respondents have negative opinions and only 6.8% of the respondents agree to the above statement. The percentage score of the above statement is 22.7 which indicates most of the respondents disagree with the above statement.

8. Regarding the statement that "PPT and its neighboring industries are spending enough for their CER", 45.5% of the respondents have a neutral opinion, 31.8% of the respondents disagree, 16.7% of the respondents agree to the above statement. The percentage score of the above statement is 43.5. Based on the above data it is clear that most of the respondents are not having a clear opinion regarding the above statement.

9. Regarding the statement that "Due to industrialization benefits are more compared to the loss and you are happy with it", 70.8% of the respondents agree and only 11% of the respondents disagree with the above statement. The percentage score of the above statement is 66.3 which indicates most of the respondents are happy due to industrialization.

10. When asked the residents in Paradip whether "They want more industries to come in Paradip", more than 80% of the respondents have a positive opinion and overall less than 10% of the total respondents have a negative opinion. The percentage score of the above statement is 74 which indicates most of the public accept the above statement. Residing at Paradip are interested in the establishment of more industries at Paradip. It may be due to a decrease in unemployment, urbanization, and development.

11. Regarding the statement that "There is an improvement in the education standards in Paradip due to industrialization", 72.3% of the respondents disagree and only 9.2% of the respondents agree with the above statement. The percentage score of the above statement is 32.3 which indicates most of the respondents accept the above statement.

12. When analyzed among the public regarding the statement that "Paradip Port and State Govt. are taking necessary steps in maintaining the cleanliness in Paradip", 42% of the respondents disagree, 39.3% of the respondents agree with the above statement. The percentage score of the above statement is 50.1 which indicates half of the respondents agree with the statement whereas the other half of the respondents disagree with it.

13. When analyzed among the public in Paradip whether "Labor conditions in Paradip are healthy and good", 40.8% of the respondents disagree and 37.5% of the respondents agree with the above statement. The percentage score of the above statement is 49.5. Similarly, like the above statement half of the respondents agree that labour conditions in Paradip are healthy and good whereas the other half of the respondents disagree with it.

14. When analyzed among the public whether "PPT and State Government are working sincerely in providing the desired quality of life in Paradip", 41.7% of the respondents have a neutral opinion, 32.7% of the respondents agree and 20.5% of the respondents disagree with the above statement. The percentage score of the above statement is 52 which indicates that most of the people agree with the statement.

15. Regarding the statement that "Sufficient rain harvesting structures are made available in Paradip", 75% of the respondents disagree and only 4.5% of the respondents agree with the above statement. The percentage score of the above statement is 31.3 which indicates the above statement is true.

16. When analyzed among the public whether "They are enjoying the better environment, health and improved living standards in Paradip", 41.4% of the respondents disagree, 36% of the respondents strongly disagree and only 11.3% of

the respondents agree with the above statement. The percentage score of the above statement is 24.9 which indicates the residents do not agree with the statement.

7.2 Regression Analysis: "Industrialization and Awareness about Environment" *vs*. Age, Years of Stay in Paradip, Qualification, and Primary Activity.

MLR analysis was carried out to study and form the bond among the Independent elements (Age, Years of stay, Qualification, and Primary Activity) and dependent elements "Industrialization and Awareness about Environment".

Table 2: Model Summary of "Industrialization and Awareness about Environment" vs. Age, Years of Stay in Paradip, Qualification, and Primary Activity

S	R^2	R^2(adj)	R^2(pred)
0.397778	54.33%	53.18%	50.00%

The R^2 (adj) value is less than 60%, describing that the data is not a good fit for the regression analysis. The R^2 (adj) value (53.18%) reveals that there is a 53% of the variation is observed due to the demographic factors on the factor "Industrialization and Awareness about the environment". In this model, the regression equation is considered and it is useful to examine the strength of the independent variables in predicting the dependent variable. The significant linear relationship between the above demographic variables is assumed and their probability of association with statements related to factor "Industrialization and Awareness about the environment".

Table 3: Coefficients of "Industrialization and Awareness about Environment" vs. Age, Years of Stay in Paradip, Qualification, and Primary Activity

Term	Coef	SE Coef	T-Value	P-Value
Constant	2.304	0.126	18.30	0.000
Age	0.00816	0.00269	3.03	0.073
Years of Stay in Paradip	-0.00201	0.00358	-0.56	0.575
Qualification	0.0103	0.0195	0.53	0.597
Primary Activity	0.0498	0.0269	1.85	0.065

All the p-value of the demographic factors like age (0.073), Years of stay in Paradip (0.575), Qualification (0.597), and Primary activity (0.065) does not plays a significant role on the response given by the public on the dimension "Industrialization and

Awareness about the environment" i.e., the public belonging different age groups, different categories of the year of stay, different educational backgrounds and different categories of primary activity are opined consistently at a 5% level of significance on the aspect "Industrialization and Awareness about the environment".

8. SUGGESTIONS:

1. The existing industries need to be transformed into an eco-industrial network through the implementation of green approaches provides a viable solution for preserving natural resources of the region as well improves the regional economy on a sustainable basis.

2. Mainly in polluted areas, cleanliness is a highly essential lack of which causes accumulation of dust and waste which attracts rodents, insects, and various microbes leading to the spread of infectious diseases.

3. Landfills gather waste that will be buried or burnt.

4. The government is trying to control the pollution by imposing fines on the industries, hotels, etc. and take strict actions when they violated.

5. Industries should use cleaner production techniques to reduce substance emissions and decrease waste. In port areas, industries should use the modified technologies to segregate and dispose of the waste in a less harmful manner, the energy-efficient and less noise-making machinery should be used.

6. The usage of products that can be recycled puts less pressure on the supply which in turn will be an advantage for the industries. Industries going with recycled products will add a competitive advantage for the industry as well as produce less wastage which will not impact both marines as well as the terrestrial environment.

7. In case of any increase in the overall pollution levels beyond the prescribed norms, companies to pay a significant percentage of total revenue towards environmental improvements in the area, and public health improvements and set of best educational facilities.

8. It the responsibility of the industries or the organizations to makes its employees aware of the activities as well as the norms or the permits industries are following to protect the environment. Recommended to fixing the penalty upto the percentage of their revenues as a penal charge.

9. The industries should produce cost-effective and best product which meets the customer needs with the eco-friendly raw materials as well produce less wastage which should be reusable then only it produces less impact on the environment.

10. Effective government regulation leads to a safe and healthy work environment.

9. CONCLUSION:

The industries need to be organized and committed to following certain systematic policies related to environmental issues. Maximum environmental issues like emission of greenhouse gases, water pollution, air pollution, land pollution are due to the industries, hence industries need to find mitigation plans to reduce the wastages and operate effectively. They should maintain strategic planning in the production of goods and services with minimum wastage which can be recycled or reused. They should have a vision on environmental development, plan the goals & targets and try to achieve it with a commitment and should improve the environmental system continuously by checking, and reviewing. The industries and ports should educate environmental awareness to all the employees, distributors, retailers, and consumers and the work done together can lead the industry to reach its vision. All the industries should encourage products that can be recycled. Usage of those products not only reduces the production cost but the waste materials produced during the production can also be recycled and reused. It may cost some time and money by turning the waste into new products but it reduces the impact on the environment.

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