

The Research Analysis for Environmental Awareness of the Residents in Pearl River Delta, China

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Abstract—The significance of resident survey in the region. In the study, the environmental awareness of the residents in Pearl River Delta is analyzed with the sixteen dimensions to realize whether there are differences in the attitudes of the residents in Pearl River Delta in solving environmental problems, their awareness of contaminants, and their visions for nature, including their awareness of the pollution level in the Pearl River Delta region, resolving attitudes, endorsing opinions with nature, etc. under various education standards, occupations and industries. Furthermore, it is attempted to realize if there is connection between responsibility awareness/cost consciousness and environmental protection behavior. Investigation methods and data processing. This study mainly uses the questionnaire survey method to conduct investigation and research on environmental awareness of the residents in nine cities and towns of the Pearl River Delta. There are a total of 20 questions, including 12 multi-choice questions and 8 multi-select questions, in which 1-4 items are basic personal data. The number of questionnaires issued was 500, with 422 recovery questionnaires; the recovery rate is 84.4%. The questionnaire data is analyzed with the SPSS software.

Keywords—pearl river delta; environmental awareness; research analysis

I. INTRODUCTION

Since China's reform and opening in the 1980s, the social economy has developed rapidly, and the standard of living of the people has also been continuously improved. However, the problem of environmental degradation has become increasingly prominent. Environmental pollution and ecological damage caused huge economic losses and harmed the health of the people so as to affect the stability of society. Industries emit a large amount of untreated waste water, gas, slag and other hazardous wastes, which will seriously disturb the ecological balance of agriculture and natural resources and cause great harm; the spread of environmental pollution and public hazards directly endangers the health of the people. If harmful substances are not handled properly, the environment will be polluted, resulting in destruction of industrial and agricultural production and people's health. After physical and chemical changes, environmental pollutants produce new substances. Many of them are harmful to people's health. These substances enter human bodies through different pipes (respiratory tracts, digestive tracts and skin). Some of them directly cause harm, and others have cumulative effects to seriously endanger human health.

II. STATISTICAL ANALYSIS OF ENVIRONMENTAL AWARENESS OF RESIDENTS IN THE PEARL RIVER DELTA

In this section, the statistical analysis of the environmental awareness of residents in the Pearl River Delta is conducted. The statistical method is the chi-square test. The detailed results are explained below.

(1) Analysis of ages and attitudes towards environmental issues

In this section, whether there are differences between respondents' ages and their opinions of the urgency of treating pollutants, untreated contaminants, and protecting nature is analyzed, which are explain as follows:

A. Age and the Awareness of the Urgency of Treating pollutants

In the Chi-Square test for age and the awareness of the urgency of treating pollutants, the significance is found to be 0.004 (as shown in Table 1), less than α (0.05). Therefore, the null hypothesis is rejected, representing there are differences in the awareness of solving pollution urgency under different ages. Known by the crosstab, among the respondents under 20, 84.3% think it is imminent, which is far higher than other age groups.

TABLE I. THE CHI-SQUARE TEST FOR AGE AND THE AWARENESS DIFFERENCES OF THE URGENCY OF TREATING POLLUTANTS

	Numerical value	Degree of freedom	Significance (two-tailed)
Pearson	29.170 ^a	12	.004
Pearson Chi-Square			
Likelihood ratio	30.017	12	.003
Linearity versus linearity relevance	3.356	1	.067
The number of valid observations	418		

B. Age and No Treating for Pollutants

In the Chi-Square test for age and no treating for pollutants, the significance is 0.006, less than 0.006. Therefore, the null hypothesis is rejected, representing there are differences in the awareness of no treating for pollutants under different ages, as shown in table 2.

TABLE II. THE CHI-SQUARE TEST FOR T FOR AGE AND THE AWARENESS DIFFERENCES OF NO TREATING FOR POLLUTANTS

	Numerical value	Degree of freedom	Significance (two-tailed)
Pearson	23.179 ^a	9	.006
Pearson Chi-Square			
Likelihood ratio	19.030	9	.025
Linearity versus linearity relevance	6.638	1	.010
The number of valid observations	409		

(2) Education standards and awareness of environmental protection costs

In this section respondents' education standards and their awareness for environmental protection costs are analyzed, including whether there are differences in the knowing of World Environment Day and their opinions of accepting raising environmental protection costs, which are explain as follows:

C. Education Standards and the Knowing of World Environment Day

In the Chi-Square test for education standards and the knowing of World Environment Day, the significance is 0.005, less than 0.005. Therefore, the null hypothesis is rejected, representing there are differences in the knowing of World Environment Day under different education standards, as shown in table 3.

TABLE III. THE CHI-SQUARE TEST FOR EDUCATION STANDARDS AND THE KNOWING DIFFERENCES OF WORLD ENVIRONMENT DAY

	Numerical value	Degree of freedom	Significance (two-tailed)
Pearson	14.820 ^a	4	.005
Pearson Chi-Square			
Likelihood ratio	14.837	4	.005
Linearity versus linearity relevance	2.742	1	.098
The number of valid observations	411		

D. Education Standards and Acceptance to Improve Environmental Protection Costs

In the Chi-Square test for education standards and acceptance to improve environmental protection costs, the significance is 0.001, less than 0.05. Therefore, the null hypothesis is rejected, representing there are differences in acceptance to improve environmental protection costs under different education standards, as shown in table 4.

TABLE IV. THE CHI-SQUARE TEST FOR EDUCATION STANDARDS AND THE ACCEPTANCE DIFFERENCES TO IMPROVE ENVIRONMENTAL PROTECTION COSTS

	Numerical value	Degree of freedom	Significance (two-tailed)
Pearson	40.142 ^a	16	.001
Pearson Chi-Square			
Likelihood ratio	33.824	16	.006
Linearity versus linearity relevance	.408	1	.523
The number of valid observations	407		

(3) Occupation and awareness of pollution degrees, resolving attitudes, and endorsing opinions with nature

In this section, whether there are differences in respondents' occupation and their awareness for pollution degrees, resolving attitudes, and endorsing opinions with nature are analyzed which are explain as follows:

E. Occupation and Their Awareness for Pollution Degrees

In the Chi-Square test for occupation and awareness for pollution degrees, the significance is 0.008, less than 0.005. Therefore, the null hypothesis is rejected, representing there are differences in their awareness for pollution degrees under different occupations, as shown in table 5.

TABLE V. THE CHI-SQUARE TEST FOR OCCUPATION AND AWARENESS DIFFERENCES FOR POLLUTION DEGREES

	Numerical value	Degree of freedom	Significance (two-tailed)
Pearson	32.904 ^a	16	.008
Chi-Square			
Likelihood ratio	33.837	16	.006
Linearity versus linearity relevance	.223	1	.637
The number of valid observations	405		

F. Occupation and Attitude towards Resolving Necessarily

In the Chi-Square test for occupation and attitude towards resolving necessarily, the significance is 0.000, less than 0.05. Therefore, the null hypothesis is rejected, representing there are differences in attitude towards resolving necessarily under different occupations, as shown in table 6.

TABLE VI. THE CHI-SQUARE TEST FOR OCCUPATION AND ATTITUDE DIFFERENCES TOWARDS RESOLVING NECESSARILY

	Numerical value	Degree of freedom	Significance (two-tailed)
Pearson	77.860 ^a	16	.000
Pearson Chi-Square			
Likelihood ratio	76.354	16	.000
Linearity versus linearity relevance	22.334	1	.000
The number of valid observations	411		

III. CONCLUSIONS AND RECOMMENDATIONS

The richer people are, the higher their quality requirements for the environment will be and the easier they will take proactive measures to reduce the impact of environmental degradation problems. In addition to the economic impact, education is also an important factor affecting the development of environmental protection concepts. Therefore, the government should guide and demonstrate the public to raise public awareness of environmental protection. Starting from basic education, in the process of being educated, the government should pay attention to the development of environmental awareness and incorporate environmental protection into everyday life so as to gradually cultivate citizens who love society and environment. For example, the people should have the right to understand relevant issues, participate in the development of large projects and feasibility studies, control the implementation of large projects, etc. In the field of education, the government should pay attention to basic education work, raise residents' awareness of environmental protection, and increase their sense of participation. The government should play an innovative role in promoting environmental protection and introduce cross-border cooperation between relevant organizations in daily work to internalize public behavior from negative expectations to positive responses and mutual cooperation to reduce conflict and friction in policy implementation. The survey suggests 31.8% of participants believe that only the government is effective in environmental protection and this ratio is the highest. It can be seen that the people recognize the government is authoritative in environmental protection. Government policies can effectively promote people's active participation in environmental protection, e.g. to eliminate environmental damage through sanctions and criticism, and to support and promote the development of government incentives and sanctions mechanisms in environmental protection through appropriate behavior rewards.

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