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Survey Analysis of Occupational Impact on Perception of Air Pollution and Its Health Effect

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Abstract Rapid economic development has brought many pollution problems such as air pollution in China, which also obstructed economic and social development. A cross-sectional survey was conducted among residents with different occupations in Nanchang and Wuyuan, China, from July to August 2015. Anonymous questionnaires were used to understand participant's perception on current air pollution. Descriptive analysis was performed for the general demographic information of the participants and a chi-squared test was conducted to estimate the perception of participants towards air pollution. Binary logistic regression analysis was conducted for the association between socio-demographic and willingness to pay for the air pollution. The result of the chi-squared tests showed that the perception of different occupation groups toward local air quality was statically significantly different ($\chi 2$=731.166, $p<0.05$). This surveyed showed that over 90% of the participants from all the occupational groups considered improving air quality is essentially important and should be the responsibility of both the government and individual citizen. All the participants support the local government to place more funding on air quality improvement, but more than 50% of respondents are not willing to pay additional money for air pollution control (OR=11.025). This information will be useful to the local government in its process of funding preparation and the development of more effective and practical regulation to control air pollution in future.

Keywords: *air pollution, human health, occupations, willing to pay, environmental protection*

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1. Introduction

Air pollution has been a growing problem worldwide and also a major risk factor attributing to climate change, global warming, and various health problems of humans. Short-term and long-term exposure to polluted air could lead to adverse health effects, including acute and chronic respiratory illnesses [1]. According to the WHO estimate in 2012, air pollution has resulted in the loss of 2.8 million years of life in the western Pacific region [2]. Although developed countries have made progress in improving air quality in the past years, many developing countries are still facing increasingly serious stages of air pollution [3]. Particulate matter (PM), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), carbon monoxide (CO), and carbon dioxide (CO_2) are the most common ambient air pollutants threatening human health in our daily life [1].

In the past three decades, China has experienced the rapid development of the economy. However, the economic achievement has been at the cost of environmental pollution with various health problems [4]. Due to the coal-dominated energy structure, China has become the world's second largest energy consumer with its coal-combustion pollution, vehicle exhaust pollution, development of transport infrastructure and rapid urbanization [5]. Dramatic measures to control air pollution have recently been taken in China. China started to deal with its environmental problems in the 1970s, and atmospheric research began in the 1980s [6,7]. The National Ambient Air Quality Standards (NAAQS) has been established and come into effect since October 1996. On September 10, 2013, the National Program called "Blue Sky" has also started national wide. Recent reports have indicated that the Chinese population is expected to reach its peak (1.44322 billion) by the year of 2025 [8]. Under the pressure of the largest populated nation, China wants to achieve the goal of quadrupling GDP per capita by year 2020 while to keep the growth continuous growth of its economy. It is predicted that a more severe situation of energy consumption in China will present in multiple pollutant emissions way [5].

The main energy structure of Nanchang city is coal-dominated which is accompanied with coal burning air pollution. Pollutants were composed of SO_2, NO_2, PM_{10} and precipitation of acid, sulfate, nitrate, etc. [9]. Nanchang has started to take measures to control the air pollution since 2008 and then implemented a new "ambient air quality standard" since 2013. Calculation of the API included only sulfur oxides, nitrogen dioxide and PM_{10} prior to 2013, but the ambient air quality index (AQI) technical regulations has included carbon, ozone oxidation and $PM_{2.5}$ [10].

Although a lot of serious measures have been taken to protect the air quality with remarkable achievements, many problems remain in environmental conservation and construction [11]. Three occupation groups that worked in different air environment conditions were tested in this survey study to understand their perception of the current air pollution and control measures. This base-line information would be interesting to public and also important to the local government, particularly to facilitate the development of more effective policy and measures in air pollution control and to have all residents to be the part of air pollution control battle through improving their air protecting awareness and supportive participation.

2. Materials and Methods

2.1. Procedures and Sample

Three different occupation groups were selected as survey subjects in this study to compare their knowledge and perception on air quality and its health effect, including government employees, manufacture workers, and farmers. A stratified random cluster sampling method was adopted and the 9 districts in Nanchang were sorted by GDP. A cross-sectional survey using convenience sampling was conducted at four sites in Jiangxi, China. The government employee and worker groups included three sites: Qingshanhu district, Qingyunpu district and Wanli district in Nanchang which is the capital of Jiangxi province, and the 4th site of this survey was the farmer group from Wuyuan County in Shangrao, which is one of air quality monitoring sites in Jiangxi. Residents who were 18 years or older were enrolled in the study. Qualified individuals were briefly introduced about this study and its purpose, and asked if they agreed to participate in this study. A total of 1,920 questionnaires were completed (response rate = 90.63%).

The three occupation groups represented three different populations including farmer, manufacture worker (MW) and government employees (GE). The government employees have higher education level and they worked in the urban area where air pollution is associated with construction, city development and motor vehicle exhaustion. Also because of working for the country, government employees have a relatively stable income and easy access to the information about the air pollution, prevention actions, and government measures from different information services.

China is in the process of development, and facing the transformation from the secondary industry to tertiary industry. Being a manufacturing worker is a significant fraction of urban population in Nanchang. Manufacture workers are a group of people who have some education and related techniques for their work. They were selected for this study and presented the worker population because they were mostly educated ones among the middle class population and the group of people expose to the polluted work environment everyday.

Wuyuan is located in the northeastern of Jiangxi province. The economic structure of Wuyuan is tourism-led and the industrial structure is continuously establishing. Primary industry and secondary industry were steady developed and tertiary industry which dominant by services was relatively fast growth. With the development of the economy and society, Wuyuan has also started to emphasize the control of air pollution emission. The emission of every ten thousand Yuan GDP energy consumption, COD (Chemical oxygen demand), sulfur dioxide and nitrogen dioxide were strictly limited under the target (12). Residents living in Wuyuan are primarily farmers, whose education levels are relatively lower than government employees and manufacture workers. Education levels and economic levels were considered as basic factors of the variable perspectives.

2.2. Data Collection

All data were collected by graduate students from the School of Public Health at Nanchang University. The questionnaire used in this study was designed by environmental health professors at the University of Hawaii and Nanchang University. Questionnaires were completed by participants themselves and assistance was available to the participants during the survey time period. Each questionnaire required about 5-10 minutes to complete.

Based on the design of the survey questionnaire, this study is aimed at collecting 5 types of information from the respondents, including (1) their demographic variable: age, gender, education level, occupation, average annual house hold incomes; (2) their perception of the local air quality and comparison with 5 years ago; (3) their awareness of air pollution survey mainly included what sources the participants thought caused air pollution; (4) the perception for their personal obligation and responsibility for reducing air pollution; and (5) their willingness to support the government's environment protection measures. This study was focused on the three occupational groups' perception of air pollution and their willingness in protecting environment.

2.3. Quality Control

Quality control for this study includes four parts: a) The questionnaires were the modification of previous used ones designed by environmental health experts of University of Hawaii and Nanchang University [13]. b) The investigation team was trained by the environmental health experts regarding the purpose and content of the survey questions and how to get the survey study to be done effectively. All the team members were capable of answering any survey related questions and providing assistance to participants to finish the survey properly. Also most team members also had previous experience in doing surveys, data collection and quality control. c) The questionnaire survey were filled out independently by all the participants themselves based on their understanding of the items in order to avoid any bias due to induced prompts of investigators. d) Prior to this survey study, a pre-survey test was conducted among the three target groups to ensure all the questions are easy to understand, no ambiguous item, and easy completion of the survey. A total of 90 respondents were included in pre-test including 30 government employees, 30 manufacture workers, and 30 farmers. EpiData3.1 was used to set up the database, and logical verification of the questionnaires was done to ensure the accuracy of the data. Double entry and validation was applied to this study's data. When the files

did not match, a verification step was taken by comparing the information with the original questionnaire.

2.4. Statistical Analysis

SPSS version 18.0 was used to analyze the data. Participants' age, gender, occupation, education level and average annual household income were analyzed in the form of descriptive analysis. The differences of the three participant groups' perception towards air pollution were analyzed using Chi-squared tests. Comparisons between different features and participant's willing to support the government's measures on environmental protection were analyzed using Chi-squared tests. The significance level was set at $\alpha = 0.05$.

2.5. Ethical Permission

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Medical ethnics committee of Nanchang University. and performed in accordance with local ethical guidelines. The questionnaire was completed only after the written informed consent was obtained from the respondents.

3. Results

3.1. General Demographic Characteristics

The study was conducted with a total of 1,920 participant subjects, 1,740 questionnaires were properly completed indicating a response rate of 90.6%, including 608 of 630 government employees in Nanchang city (response rate 96.5%), 600 of 690 manufacture workers in Nanchang city (response rate 86.96%), and 532 of 600 farmers in Wuyuan county (response rate 88.67%). Of the 1,740 participant subjects, 63.7% were males and more males were reported from all the three groups. A little over half of the government employee group (53.4%) was between the ages of 30-49 years old, Nearly 57% of the respondents in worker group were ≤29 years old, but over 60% of farmer group had an age to be ≥50 years old. The distributions of the total participants' ages were significantly different among three groups (Table 1).

Table 1. General demographic information of the participants

Demographic Factors	Total	Government Employee	Manufacture Worker	Farmer	*p*-value
	N (%)	N (%)	N (%)	N (%)	
Gender					
Male	1109 (63.7)	419 (68.9)	363 (60.5)	327 (61.5)	0.004
Female	631 (36.3)	189 (31.1)	237 (39.5)	205 (38.5)	
Age					
≤29	556 (32.0)	187 (30.8)	340 (56.7)	29 (5.5)	<0.001
30-49	767 (44.0)	325 (53.4)	260 (43.3)	182 (34.2)	
≥50	417 (24.0)	96 (15.8)	0 (0.0)	321 (60.3)	
Education*					
≤ES	348 (20.0)	0 (0.0)	33 (5.5)	315 (59.2)	<0.001
JHS-HS	635 (36.5)	32 (5.3)	401 (66.8)	202 (38.0)	
≥College	757 (43.5)	576 (94.7)	166 (27.7)	15 (2.8)	
AAHI (¥)**					
≤9,999	242 (13.9)	24 (3.9)	66 (11.0)	152 (28.6)	<0.001
10,000-24,999	519 (29.8)	125 (20.6)	118 (19.7)	276 (51.9)	
25,000-49,999	546 (31.4)	246 (40.5)	213 (35.5)	87 (16.4)	
≥50,000		213 (35.0)	203 (33.8)	17 (3.1)	
Total		**608 (100.0)**	**600 (100.0)**	**532 (100.0)**	

* ES = Elementary school, JHS = Junior high school, HS = high school
** AAHI = Average annual household income.

Among the three population groups, the distribution of the educational level was also quite different. As shown in Table 1, nearly 95% respondents from the government employee group had at least a college degree, as compared to most participants in the worker group only had a high school education or below (66.8%) and nearly 60% of the farmers had an elementary school degree or no education. Examination of the average annual household income (AAHI) among the three groups indicated that most government employees (75.5%) and workers (69.3%) earned more than 25,000 RMB as compared to more than 80% of farmers reported their AAHI to be ≤ 25,000 RMB.

3.2. Perception towards Air Pollution

As shown in Table 2, only 19.4% participants in the government employee group and 15.3% of the worker group considered the local air quality to be "good and very good", and majority of them considered last year's air quality to be fair (46.1% for GE group and 40.5% for MW group. These findings are very different from the survey from the farmer group showing that large majority (nearly 85%) considered the air quality in 2014 to be good and very good. Results of chi-squared tests showed that the perception among these three occupation groups toward local air quality in 2014 was significantly different (χ^2=731.166, p<0.001). In addition, the answers towards air quality compared 5 years ago among the three groups were also statistically significantly different (χ^2=492.498, p<0.001). Among the 1,740 respondents, 917 (52.7%) perceived that the air quality to be "worse" than 5 years ago, and this is particularly relevant to the respondents from most of government employees (412, 67.8%) and workers (400, 66.7%). However, only less than 20% farmer participants believed that air quality was worse than 5 years ago but nearly half of the farmer respondents (270, 50.8%) believed that there was no difference. The

majority participants from the three groups (1,134, 65.2%) perceived that the local government has spent "little/too little" resources for preserving air pollution and protecting the local environment. Majority participants from government employees (71.7%) and workers (83.2%) thought the local government did not pay enough attention to protect the local environment. Over 93% of all participants (97.9% of the government employee group, 97.0% of the worker group and 83.8% of the farmer group) believed that improvement of air quality is also every citizen's responsibility.

Table 2. Respondents' attitudes to the current air quality, government's funding and individual responsibility on air quality improvement

	Total	Government employee	Worker	Farmer	*p*-value
The air quality in your Residence last year					
Good/Very Good	660 (37.9%)	118 (19.4%)	92 (15.3%)	450 (84.6%)	<0.001
Fair	590 (33.9%)	280 (46.1%)	243 (40.5%)	67 (12.6%)	
Poor/ Very Poor	490 (28.2%)	210 (34.5%)	265 (44.2%)	15 (2.8%)	
The air quality in your Residence last year compared to 5 years ago					
Better	336 (19.4%)	87 (14.3%)	98 (16.3%)	151 (28.4%)	<0.001
No Difference	394 (22.6%)	75 (12.3%)	49 (8.2%)	270 (50.8%)	
Worse	917 (52.7%)	412 (67.8%)	400 (66.7%)	105 (19.7%)	
Don't Know	93 (5.3%)	34 (5.6%)	53 (8.8%)	6 (1.1%)	
The amount of resources local government spends for protecting the local environment					
Much/Too Much	240 (13.8%)	93 (15.3%)	53 (8.8%)	94 (17.7%)	<0.001
Right Amount	276 (15.9%)	79 (13.0%)	48 (8.0%)	149 (28.0%)	
Little/Too Little	1134 (65.2%)	436 (71.7%)	499 (83.2%)	199 (37.4%)	
Don't Know	90 (5.1%)	0 (0.0%)	0 (0.0%)	90 (16.9%)	
Improving the air quality is the responsibility of everyone					
Agree/Strongly Agree	1623 (93.3%)	595 (97.9%)	582 (97.0%)	446 (83.8%)	<0.001
Disagree /Strongly Disagree	13 (0.7%)	2 (0.3%)	5 (0.8%)	6 (1.2%)	
Don't Know	104 (6.0%)	11 (1.8%)	13 (2.2%)	80 (15.0%)	

3.3. The Willingness to Pay Monthly Fees to Improve the Air Quality

Results of chi-squared test in Table 3 showed that the willingness to pay monthly fees to improve the air quality among all respondents were apparently affected by four factors, including gender, age, educational level and AAHI. The three occupation groups' willingness to pay more taxes for air quality improvement was all significantly affected by the AAHI. Moreover, the binary logistic regression analysis results (Table 4) indicated that the respondents' AAHI was the strongest statistically significant factor affecting the willingness of the participants to pay more. Those respondents having AAHI of ≥500,000 RMB in all three groups were more likely to pay more taxes for air quality control (the OR value of government employee group was 252.955 and p<0.001) and the OR value of overall was 11.025, respectively (p<0.001).

Table 3. The Willingness to pay (WTP) monthly fees to improve the air quality

Character	Government employee			Worker			Farmer			Total		
	Yes n (%)	No n (%)	P	Yes n (%)	No n (%)	P	Yes n (%)	No n (%)	P	Yes n (%)	No n (%)	*P*
Gender												
Male	261 (62.3)	158 (37.7)	<0.001	174 (47.9)	189 (52.1)	0.441	164 (50.2)	163 (49.8)	0.236	599 (54.0)	510 (46.0)	<0.001
Female	23 (12.2)	166 (87.8)		106 (44.7)	131 (55.3)		92 (44.9)	113 (55.1)		221 (35.0)	410 (65.0)	
Age												
≤29	149 (79.7)	38 (20.3)	<0.001	152 (44.7)	188 (55.3)	0.271	12 (41.4)	17 (58.6)	0.551	313 (56.3)	243 (43.7)	<0.001
30-49	56 (17.2)	269 (82.8)		128 (49.2)	132 (50.8)		84 (46.2)	98 (53.8)		268 (34.9)	499 (65.1)	
≥50	79 (82.3)	17 (17.7)		0 (0.0)	0 (0.0)		160 (49.8)	161 (50.2)		239 (57.3)	178 (42.7)	
Education												
≤ES	0 (0.0)	0 (0.0)	0.066	10 (30.3)	23 (69.7)	0.002	141 (44.8)	174 (55.2)	0.175	151 (43.4)	197 (56.6)	0.002
JH-HS	20 (62.5)	12 (37.5)		207 (51.6)	194 (48.4)		107 (53.0)	95 (47.0)		334 (52.6)	301 (47.4)	
≥College	264 (45.8)	312 (54.2)		63 (38.0)	103 (62.0)		8 (53.3)	7 (46.7)		335 (44.3)	422 (55.7)	
AAHI* (¥)												
≤9,999	2 (8.3)	22 (91.7)		25 (37.9)	41 (62.1)		63 (41.4)	89 (58.6)		90 (37.2)	152 (62.8)	
10,000-24,999	7 (5.6)	118 (94.4)	<0.001	47 (39.8)	71 (60.2)	<0.001	130 (47.1)	146 (52.9)	0.018	184 (35.5)	335 (64.5)	<0.001
25,000-49,999	75 (30.5)	171 (69.5)		78 (36.6)	135 (63.4)		51 (58.6)	36 (41.4)		204 (37.4)	342 (62.6)	
≥50,000	200 (93.9)	13 (6.1)		130 (64.0)	73 (36.0)		12 (70.6)	5 (29.4)		342 (79.0)	91 (21.0)	
Total	**284 (46.7)**	**324 (53.3)**		**280 (46.7)**	**320 (53.3)**		**256 (48.1)**	**276 (51.9)**		**820 (47.1)**	**920 (52.9)**	

ES = elementary school; JHS-HS = Junior high school-high school, AAHI = average annual home income.

Table 4. Multinomial logistic regression analysis for the association between socio-demographic and the WTP

Variable(s)	WTP		OR	95%CI	p-value
	Yes	No			
Gender					
Male	599	510	0.59	[0.474,0.74]	0.00
Female	221	410	-	-	-
Age					
≤ 29	313	243	0.87	[0.59,1.28]	0.48
30-49	268	499	2.17	[1.56,2.30]	0.00
≥50	820	178	-	-	-
Education					
≤ ES	151	197	0.79	[0.49,1.29]	0.35
JHS-HS	334	301	0.50	[0.35,0.72]	0.00
≥College	335	422	-	-	-
AAHI (¥)					
≤9,999	90	152	11.03	[7.35,16.55]	0.00
10,000-24,999	184	335	9.03	[6.40,12.73]	0.00
25,000-49,999	204	342	5.84	[4.31,7.92]	0.00
≥50,000	342	91	-	-	-
Occupation					
Government employee	284	324	1.60	[1.00,2.55]	0.50
Worker	280	320	2.53	[1.72,3.71]	0.00
Farmer	256	276	-	-	-

***** CI = confidence interval; OR = odds ratio. Note: assigned "the willingness=no" to 0, "the willingness=yes" to 1; Assigned "age ≤ 29" to 1 (control group), "30-49" = 2, "≥50" = 3; Assigned "Educational level ≤Elementary school (ES)" to 1(control group), "Junior high school-high school (JHS-HS)" = 2, "≥College" = 3; Assigned "annual average household income (AAHI)＜RMB (¥) 9,999" to 1(control group), "RMB 10,000-24,999" = 2, "RMB 25,000-49,999" = 3, "≥RMB 50,000" = 4.

4. Discussions

4.1. Understanding of the Perception from Different Occupations toward Air Quality

Although more and more people have begun to notice the air pollution in recent years, studies on understanding the public's perception on air pollution is very limited in China. This study was conducted to determine if public perception on current air pollution and health effect may be affected by different occupations. Through the survey study focusing on three occupational groups including government employees, construction workers, and farmers, we have shown that the majority of residents in government employee and worker groups considered that the air quality in Nanchang needs to be improved. However, the majority of the farmer group considered the current air quality in Wuyuan was acceptable and was as good as 5 years ago. This different response between these groups is primarily affected by the residency place where they live. The government employees and workers live in urban areas with more serious air pollution and so they were more likely to express concerns about air quality. Nanchang is the capital of Jiangxi province and current increase of industry facilities and numbers of vehicles have apparently led to aggravated poor air quality in the past year [13,14,15,16]. As comparison, Wuyuan is a rural area far away from Nanchang city with limited the industry development and thus less pollution effect has occurred on current air quality. However, with the current development of the region, including rapid rural urbanization and construction, and growing industry and transportation, effectively environmental protection measurement is urgently needed to take in order to maintain the good air quality in Wuyuan.

4.2. Individual and Governmental Actions to Improve Air Quality

In China, many measures have been taken to control air pollution, especially in urban areas [17]. For example, the industrial coal and vehicle exhaust was controlled to reduce the NO_2. However, these efforts could not keep up with the increase of motor vehicles and the unprecedented construction, suggesting that the government need to pay more attention for improved and enhanced public transportation and to limit and control presently rapid growth of construction. Majority of all participants (65.2%) regardless their occupations suggested the government to place more funding on local air pollution control. As the organizations that represent public social interest, the local governments have compelling obligations in air pollution control. In the 2013, Renmin University of China issued the "Report on the performance evaluation of urban air quality management in China", and assessed the current status and changing trends of air quality of 281 cities in China during its "11th Five-Year Plan" period of time. The study showed that only 10.67% of these 281 cities to have good air quality, 75.80% of them were listed in the bad cities with poor air, and 13.52% of these cities considered worse cities with highly polluted air [18]. Nanchang is one of the cities listed in the bad city category and this might be a result from the lack of effective control and management air pollution from the Nanchang government. And this result also indicates that more funding needs to be placed and more effective approaches need to be established from the local government in order to improve the current air quality and to meet the public desire and requirement for good air.

In this study, over 90% of respondents were in agreement with that improving air quality is the

responsibility of both government and individual residents. This result is consistent with the previous findings [13,19] clearly indicating that residents are willing to take the responsibility and to work with the government together in the battle of fighting for qualified air to breath. Such information should be extremely meaningful and important to the local government in the development of more vigorously tough and effective policy and regulation for air pollution control in future.

Our findings also emphasize the necessities for local governments to place more funding sources on air quality improvement, enhanced governance, and more practical and effective regulation, and increased intensity of implementation [20]. It may also be a useful approach to put the air quality indicators into the official performance assessment. While taking the advantage of public's desire for good air quality and strong support for air pollution prevention and control, the local government may also need to provide more education to its residents in different living areas with different occupations and to encourage everyone to do something to protect air quality during their daily life or work activities.

4.3. Willingness to Pay Monthly Fees to Improve Air Quality

When the participants were asked whether they are willing to pay a little more tax to improve the air quality, less than half of participants from all three groups expressed their support to this idea. This low willingness to pay (WTP) may be due to at least three main possible reasons: a) residents thought that they had already paid enough taxes every year; b) people believe other related parties such as companies or individuals who generated the pollution should pay more for air pollution control; c) Jiangxi is ranked as one of low-income province and the people who live in the area have relatively limited financial sources. It was unexpected to show that the perception of WTP in the farmer group was higher than the government employee and worker groups despite of their relative low amount of family income, limited education, and relatively good air quality. This finding is inconsistent with previous studies which demonstrated a positive relationship between income and environmental concern showing the poorer people tend to be less concerned about air quality [13,20]. This inconsistent observation may be attributed to limited sample size and survey areas, and suggest the need for more future investigation with large number of subject enrollment from more regions. This study has also revealed that a huge majority of the respondents believed that decreasing smoking could help to improve the ambient air environment and lead to a decreased risk of second-hand smoke exposure [21].

The result showed that male government employees were much more willing to pay monthly fees to improve the air quality than female ones. It indicates that males were more likely to take responsibility in this society and care the further life quality. Besides, females were commonly under pressure of the family finance and tending to control the household expenditure. It is very interesting to note that people at age ≤29 and ≥50 years old were willing to pay additional money to improve the air quality. This may also suggest that people whose age between 30 and 49 were currently under more financial burden for their life, due to establishing their family and family support.

The impact on the peripheral provinces' environment should also be considered when formulating Jiangxi air-quality strategies where a balanced and practical approach is implemented to minimize different sources of pollution. In addition, any changes to current policies to improve air quality could have a significant impact on national and even global environmental protection. The application of technologies such as desulphurization, selective catalytic reduction, and electrostatic precipitators to reduce cities' emissions of SO_2, NO_2, and fine particles, respectively, can remove national pollutants such as mercury, which is released by the burning of coal. To further decrease air pollution, multi-province collaboration is also needed due to the potential national impact of continuing increase of air pollution in Jiangxi.

4.4. Limitations

There are a few limitations for this survey studies. Firstly, the four sites in this survey are not the most serious place for air pollution in Jiangxi province. And the design of the study has limited participation of the three groups from the areas where air quality is particularly poor. Secondly, the survey participants were limited to the three groups of government employees, workers and farmers. Residents of other occupations (including businessmen, teachers, and students and so on) may have different attitudes. Thirdly, as the survey didn't contain open-ended questions it failed to reveal new problems and deepen the understanding of the situation. Thirdly, there was limited number of respondents from every group and there is a need to increase sample size in order to get a more meaningful result. Thus, application of the findings to other areas needs to be done with caution. Lastly, this survey study did not consider indoor air quality and its health effect on public health. Indoor air pollution has become an increasing risk to human health worldwide responsible many illnesses and death. More future study needs to be conducted with the inclusion of indoor air pollution in order to properly assess air pollution related health effect.

5. Conclusions

Results obtained from this investigation demonstrate that the three groups had different perceptions on the air quality. Difference in education and income level among the three groups may have affected their perception on current air quality. It is particularly interesting to note that, even though the majority of the participants from all the three groups has urged the government to lace more fund on air quality improvement, less than 50% of the respondents are willing to pay additional money. Theses findings suggest that the local government needs to think about other funding sources rather than tax increase for their use in air quality improvement. All together, findings from this investigation may provide some essential basis information useful to the government in their attempt to control the current air pollution and improve public health.

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