

# 第四届大学生国际学术研讨会论文宣读 Sample

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## Research Paper Sample

### Theme: Sustainability and Environment

## The Effectiveness of the Garbage Classification Regulation in Shanghai

### Abstract

Garbage classification, a significant part of environment protection, has drawn increasing attention of both the public and the government. In order to explore the effectiveness of the current regulation on garbage classification in Shanghai, a survey via questionnaires (n=300) was conducted in May, 2015 among residents and sanitation workers in Shanghai on their awareness of and attitudes towards garbage classification. An interview was also conducted in some housing estates and garbage management stations. The study reveals that despite most respondents' awareness of the benefits of garbage classification(85.67%), only 31% of them have formed such a good habit. Lack of the awareness of environment protection is the primary reason for the gap. Respondents' knowledge of the garbage management and classification is also to blame. Suggestions for improvements are put forward in the discussion part.

**Key words:** urban domestic garbage; garbage regulation; garbage classification; Shanghai

### Introduction

Garbage is now becoming a serious challenge to the city's future development (Chen,2013) and detrimental to people's health (Cai, 2013). Since garbage is also regarded as the resources mislaid (Peng,2011), recycling has received much attention as an efficient and effective garbage management method (Wen, 2008; Wang, 2014). Recycling, however, rely heavily on garbage classification. Numerous studies have been dedicated to the factors that affect the efficient garbage classification (Zhang 2007, Chen 2013,Fukuyama,2000).Among them is the study of residents' attitude and participation which play a vital role in the process of garbage classification. Chen (2013) and Fukuyama (2000) reported that the lack of education and noncooperation of residents might lead to the failure of garbage classification. Other studies regarding the efficient garbage classification is the government's regulation which is comprised of incentive systems (punishment and subsidy) (Fukuyama,2000), classification standards and publicity of the regulation. For example, studies found that New South

Wales, Australia set up specialized companies for garbage management (Peng, 2011). Japan issued the Waste Management Act as early as 1970 (Wang, 2014). In the U.S, garbage classification is under the control of the Resource Conservation and Recovery Act (RCRA) (Wen, 2008).

With growing concern over garbage classification and management, Shanghai government issued Promotion of Domestic Garbage Classification Act (PDGCA) in 2014, the first local act that embodies the government's regulation. However, studies conducted to evaluate its effectiveness are scarce. This study attempts to explore the effectiveness of the regulation in Shanghai since the enactment of PDGCA by studying the detailed content of the act (obtained from official website) and conducting a survey and an interview among residents and sanitation workers.

## **Materials and Methods**

### *Participants*

A standard questionnaire was mailed to a randomly selected sample of 2000 persons in May, 2015, which was responded by 300 (15%) persons. Among the respondents, 290 (96.67%) were aged 17-24. Males accounted for 43.33% and females 56.67%. Interviews were also conducted among residents in some residential estates near Fudan University, the estates where the regulation were being trialed. They were aged 59 to 74, and all female. Participants were asked open-ended questions about the knowledge, incentives and attitudes towards garbage classification. Information provided by sanitation workers and employees at garbage management stations were also collected.

### *Procedure*

Questionnaires designed for anonymous response comprised of 11 questions. These questions can be divided into five parts with regard to their purposes:

Q1 and Q2 gauged the general public's awareness of garbage classification. Q1 investigated their knowledge of classified garbage bins, while Q2 attempted to measure the publicity of garbage classification. Residents' habit of classifying domestic garbage was investigated in Q3 and Q4. The purpose was to ascertain the link between the residents' knowledge of garbage management and their garbage classification habit. Q5 evaluated residents' interest in and the feasibility of the current garbage classification instructions to find out whether any improvement is needed on the status quo.

Q6 to Q9 were designed to investigate citizens' attitude towards garbage classification. Q6 and Q7 attempted to find out whether the reason for failure in garbage classification was internal or external. Q8 inquired further about the specific factors that affected residents' garbage classification. Q9 evaluated citizens' willingness to participate in garbage classification if some of the external obstacles

were removed. Q10 and Q11 investigated the status quo of garbage classification. The purpose was to obtain information on the inconvenience of garbage classification among residents in practice.

## Results

Table 1 shows the gap between what the respondents thought and what they actually practiced in terms of garbage classification. Although the majority were aware of the importance of using classified garbage bins (87%) and reported a better understanding of the benefits of garbage classification(85.67% ), the proportion who had actually formed this habit were quite lower (31%) . The gap was further underscored by Table 2 which demonstrates that 93.33% knew that the lack of cultivation of garbage classification habit was the major obstacle to the effectiveness of the regulation though76.33% claimed no knowledge of garbage management procedures.

**Table 1 Respondents' knowledge of garbage management**

	Positive Number/ Percentage	Negative Number/ Percentage	Neutral (no attitudes) Number /Percentage
Awareness of classified garbage bins (Q1)	261/87%	39/13%	
Publicity of garbage classification. (Q2)	25/21.67%	65/8.33%	210/70%
Knowledge of garbage management procedures (Q3)	71/23.67%	229/76.33%	
Habit of garbage classification (Q4)	93/31%	62/20.67%	145/48.33%
Clear instructions on garbage classification (Q5)	92/30.67%	65/21.67%	143/47.67
Understanding of the benefits of garbage classification (Q6)	257/85.67%	4/1.33%	39/13%

**Table 2 Factors preventing the regulation from practice (Q8)**

Factors	Number/Percentage
Lack of cultivation of garbage classifying habit	280/93.33%
Lack of incentive and supervision system	163/54.33%
Lack of professional garbage management companies	119/39.67%
Lack of knowledge of garbage management procedures	191/63.67%

**Table 3 The status quo of the practice of the regulation**

	Positive Number/ Percentage	Negative Number/ Percentage	Neutral (no attitudes) Number/ Percentage
Practice of the regulation (Q10)	37/12.33%	263/87.67%	
Inconvenience brought by the regulation (Q11)	0/0%	122/40.54%	178/59.46%

The interview conducted among the residents confirmed their positive attitudes toward the regulation. One resident from the regulated housing estate said,  
Although garbage classification causes a little inconvenience, I soon got used to it. It is our responsibility to make contribution to our environment and I feel honored to be a participant of this activity.

When asked the reasons why the regulation failed to be implemented, some residents blamed sanitation workers for neglecting their duty:

Sanitation workers are so irresponsible that they put the classified garbage bins in the wrong position several times! I'm totally confused!

On the other hand, sanitation workers complained highly about the increased workload and the lack of adequate special subsidies:

Our workload has nearly doubled after the practice of the regulation. However, our wages are increased by only 300 RMB. It is really unfair.

## Discussion

The purpose of this study was to evaluate the effectiveness of the newly-released PDGCA, and to analyze the factors that hinder the regulation from effective execution. The results show that the citizens' habits of garbage classification were not formed and the situation of implementing the regulation was not satisfactory. There are several explanations for its failure. First, most respondents lacked the knowledge of garbage management procedures (76.33%) though they had positive attitudes towards garbage classification. They attributed the lack of the knowledge to the poor publicity of garbage classification as 70% failed to give a definite answer. Second, work pressure and family pressure affected the formation of the habit. Our interviewer shows that the elderly were more willing to adapt to the regulation and more actively engaged in garbage classification than the younger residents as they had more leisure time. Third, the incentive and supervision system are not efficient (see Table 2), as an interviewee commented:

The government will provide a reward to those who put garbage into different bins, But to be honest, the incentive is not very attractive and the bottom line is that it is inconvenient to follow the regulation strictly.

Finally, the effective practice of garbage classification depends on sanitation workers as well as residents. For example, Sanitation workers' increased workload was not subsidized correspondingly. The study also suggested that a considerable number of sanitation workers were not qualified enough for effective garbage classification, and thus professional training is urgently needed.

The findings of this study were partially consistent with some of the previous studies (K. Fukuyama,2000), where publicity, residents' level of education and the incentive system are major contributing factors. The data and interview of this study show that the cultivation of the residents' habit and knowledge of garbage management process play a more important part. No significant correlation, however, is found between the level of education and participation in garbage classification. The incentive system does not seem to function in Shanghai as well. It is surmised that the incentive might be so small that it could not attract most residents.

Overall, there are several suggestions to improve the effectiveness of regulation on garbage classification. First, the habit of garbage classification should be cultivated from an early age. In Japan where garbage classification has been successfully executed for decades, the awareness of garbage classification is instilled into kindergarten children and the program of environment protection is incorporated into primary education (Dou, 2012). Second, the garbage management procedure should be publicized and the instructions for garbage classification should be simple and concise. Confusion might be avoided primarily at the stage of cultivating residents' habit of garbage classification. Finally, the government should establish professional garbage classification companies. We may learn from Australia where professional garbage management companies are set up and supervised by the government who can effectively help train qualified garbage management workers (Peng, 2011). Government intervention is needed in China where a sustainable profit chain has not yet formed in garbage management industry.

The respondents are mainly young adults, while the interviewees are composed of seniors. Thus, the sample of this study, although balanced overall, has certain limitations. Hence the results of the study should be treated with caution. Further research is recommended to analyze, on a larger and more balanced scale, the factors that influence domestic garbage classification.

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