Readiness of residents of Arkhangelsk for garbage reform changes. Sociological research

N S Larionova¹, T V Pyankova²

¹Philosophy and Sociology Department, The Northern Arctic Federal University named after M V Lomonosov, Arkhangelsk, Russia
²Department of Roman-Germanic and Russian Philology, Sochi State University, Sochi, Russia.

n.larionova@narfu.ru, tvpyankova@yandex.ru

Abstract. The problem of ecological consciousness of urban population on the example of residents of Arkhangelsk is raised in the article. A brief description of the importance of solving environmental problems in the Arctic is given. The article describes the garbage reform in Russia and the reasons for its realization. The Arkhangelsk region is considered to be the one of the Arctic regions of Russia. The analysis of the cause of the acute social debate about the garbage topic in the Arkhangelsk region is also given. A bilateral initiative of changing attitudes towards natural resources is described. The sociological research results of the readiness of the population of the Arkhangelsk region for separate waste collection are given. The number of study participants is given and the selection is determined. The authors explain the reason for the dual nature of the questionnaire, because the study was carried out both extra-mural (online) and face-to-face (with the help of interviewers). The result of subjective assessment of purity of the city by residents is given, and noted reasons are analyzed in the article. The analysis of the most popular categories of solid municipal waste distribution and the reason for the high proportion of plastic waste is provided. The results of solving situational problems aimed at studying the environmental behavior of respondents are given. The reason for probability of insincere answers of sociological research participants is described. The population’s opinion on the readiness for garbage separation obtained during sociological research is also analyzed. Statistics of the availability of containers for separate collection of solid municipal wastes by their geographical and numerical incidence in Arkhangelsk is given. General conclusions of the research are presented and recommendation on mass education of the population of the region is given in this work. The article contains charts and tables showing the main results of sociological research.

1. Reasons for research practice

The task of developing ecological consciousness nowadays is ever more pressingly: the expansion of technologies has led to urbanization, overpopulation, lack of resources, environment pollution. Resolving these challenges raises the question of conditions for the continued existence of humans as a biological species. Arctic ecological problems are among the most important due to the fragility of the Arctic ecosystem. Natural and geographical features of the region transform local environmental changes into global ones. One of the central ecological problems in the Arctic identified in the UN program is pollution caused by human activities [1].
On January 1, 2019, Russia launched a reform that consisted in changing the processing and elimination of solid municipal wastes - the so-called "garbage reform."

This reform was caused by a number of objective reasons, among them are the huge amount of wastes generated in household and industry; waste processing facilities have ceased to cope with their tasks, became obsolete and do not meet modern requirements; the percentage of waste recycling is very low compared to the European countries, and in addition new environmentally hazardous wastes - such as plastic, polymers, electrical appliances - have emerged in the modern world. It is also worthwhile noting that every year more than 500 000 hectares of useful area go for the construction of new landfills, as well as numerous spontaneous unauthorized landfills regularly appear, damaging ecology and deteriorating the quality of life [5].

The modern Russian solid municipal waste management system is extremely outdated, not in accordance with modern world standards of processing and recycling technology.

Most Russian regions took part in garbage reform in 2019. The rest of others including the Arkhangelsk region, went into this reform on January 1, 2020.

The Arkhangelsk region is one of the Arctic regions of Russia, therefore, resolving the issues of waste reduction and recycling in this territory is one of the key issues in the discussion of improving the Arctic ecology problem.

In terms of studying public opinion on the disposal of solid municipal wastes, the Arkhangelsk region is a rather complex region. This is due to the active confrontation of the local population caused by the construction of eco-technological park at the Shies railway station (Urdoma settlement, Lensky district) in the southeast Arkhangelsk region. Numerous rallies, protests, as well as social resonance, supported by the mass media, caused fraught social debate among residents of the region and the regional authorities on any issues related to the garbage subject [2], [3].

At the same time, such public outcry caused the residents of the region to think about the problem of recycling of waste. In social networks the number of Internet publics on ecological behavior and careful attitude to resources has increased. Eco-friendly goods stores appeared, as well as shops offering consumers goods without packaging.

It is possible to observe a bilateral initiative of changing attitudes towards natural resources - a governmental top-down approach in the form of the ongoing garbage reform, as well as an initiative of citizens themselves (a shopfloor initiative), who understand the importance of changing attitudes towards the environment. Of course, this reform takes only the first steps. At the moment, Russia does not have sufficient capacity in the form of garage recycling plants and incinerators. The Arkhangelsk region constitute no exception. The population of the region shows a low degree of trust in the local authorities, as the regional administration was unable to respond well-timed to the needs of the local population in order to make the necessary adjustments to the action plan for the set of joint decisions elaboration on the construction of the “Shies” eco-park.

These factors have led to a sociological research for studying the readiness of the population of the Arkhangelsk region for separate waste collection.

2. The results of the sociological poll
As already mentioned in the previous paragraph of this article, the garbage reform in the Arkhangelsk region started on January 1, 2020. In order to determine the ecological consciousness of the population, as well as its readiness for changes, a sociological poll was conducted to study the ecological behavior of the residents of Arkhangelsk as the center of the region. A number of questions were asked during the research. The questions were aimed at highlighting the major problems of garbage reform. 604 people took the survey, the sampling quota is gender, age and district of residence. The survey was conducted during the transition period, from December 24, 2019 to January 31, 2020, at which point it is covered the time before and after the beginning of the garbage reform implementation in the Arkhangelsk region. The research was carried out both extra-mural (online) and face-to-face (with the help of interviewers). The reason for the dual nature of the survey is the low activity of masculine, as well as respondents over 50 years old in online research. At the same time, it
must not be forgotten that a lot of questions related to garbage separation and definition of personal environmental responsibility relate to sensitive issues, ones that cause awkwardness and possible avoidance of true answer. Therefore, the survey participants, who had a face-to-face discussion, could answer insincerely, due to the factor of social approval [7].

At the very beginning of the survey the residents of the city were asked to give a subjective assessment of the total cleanliness of Arkhangelsk, according to a 10 points system, where 1 point is very dirty, and 10 points is very clean. The assessment of the city cleanliness is shown in Figure 1.

![Figure 1. The assessment of the city cleanliness by inhabitants of Arkhangelsk according to a 10 points system](image)

More than half of the respondents (66.5%) gave a very low assessment of the cleanliness of Arkhangelsk: the most popular ratings are 1, 3 and 2. Higher assessment is available, too, but they are unessential for the overall picture characteristics. The residents of Arkhangelsk consider the city to be very dirty in most cases.

Further, study participants were asked to identify the main causes of pollution of the city. The respondents noted the following:

1. «Residents themselves throw garbage right on the land, not into containers» (56.3%)
2. «The garbage is not taken out» (45.7%)
3. «There are few garbage cans and bins in the streets» (44.5%)
4. «Poor organization of scavengers and cleaning equipment» (40.7%)
5. «Unauthorized landfills» (33.8%)
6. «Insufficient number of recycling points» (33.6%)
7. «Animals and birds pull garbage from containers» (33.1%)
8. «Other» (2.3%)

If we analyze these answers, we can conveniently classify them into three groups.

Group 1 are the answers showing residents awareness of their personal responsibility for the presence of garbage outside (answer 1 and answer 5).

Group 2 are the answers demonstrating insufficient organization of garbage cleaning by the municipality and the regional operator (answers 2,3,4,6).

Group 3 are the answers that contain understanding of external causes (answer 7).
In summary, most of the answers explaining the causes of dirty city are those that describe the low organization of the cleanness of the city in terms of activities of local authorities and the regional operator (k=0.55) compared to those that describe the understanding of personal responsibility of inhabitants (k=0.3). Responses describing external causes are the smallest part of the answers (k=0.11). The option "Other" gives individual answers to problems that do not play a fundamental role in changing the overall picture.

A sociological research examined the problem of purchasing plastic during shopping. According to the results of the research, the share of plastic garbage in the respondents’ waste-baskets ranks second after food wastes. Then there is paper, metal and glass wastes, respectively. In each store of Arkhangelsk there is a service of plastic bag acquisition for purchased goods. These bags are used for garbage afterwards. In addition, some categories of citizens, for example, pensioners, also use these bags for making following purchases. Table 1 shows the distribution of answers to the question about the purchase of a plastic bag in stores.

Table 1. Plastic package acquisition for purchased goods.

| Answer                                | % |
|---------------------------------------|---|
| I buy the package                     | 17,7 |
| I bring a previously purchased package| 45,7 |
| I use fabric package                  | 35,4 |
| Other option                          | 11,2 |

In addition to bags, plastic products are purchased as beverage bottles and goods packaging. When asked what packaging the respondent uses for water or beverages he carries with him, the answers were distributed as it is shown in Table 2.

Table 2. Packaging for water or beverage

| Answer                                              | % |
|-----------------------------------------------------|---|
| Disposable plastic bottle                           | 20,0 |
| Disposable plastic repeatedly used bottle           | 35,9 |
| Special reusable bottle                             | 34,6 |
| Other option                                        | 0,2 |
| I don’t take water or beverage with me              | 8,9 |

Goods in grocery stores are often packed in plastic. Table 3 demonstrates the results of the answers to the question whether the respondent uses his own packaging equipment (containers, eco-bags of special fabric, glass cans, etc.) or not.

Table 3. Usage one’s own packaging equipment for goods

| Answer                                | % |
|---------------------------------------|---|
Thus, according to the results of tables 1, 2 and 3, it is possible to conclude that the bulk of plastic purchased by the respondents is the packaging of goods. Then, approximately equally with a slight advantage of 2.3%, there are packaging for beverages, and then shopping bags.

Next, during the research, the question of the environmental behavior of the respondents was studied. The study participants were offered situations and possible patterns of behavior for resolving these situations, shown below in pie charts. This particular part of the research is sensitive and presents the greatest difficulty for study, since it admits the possibility of insincere answers in order to obtain social approval in face-to-face interaction with questionnaire survey participants.

When asked what the respondent would do if he needed to get rid of small parts of garbage (for example, candy wrappers, cigarette butts, package from cakes, etc.), the answers were distributed as shown in the diagram in figure 2.

![Figure 2. Action outside when having a small garbage in one's pocket](image)

More than half of the research participants showed their readiness to pocket the small garbage; almost a third of the respondents are ready to spend time looking for a container or litter bin. The rest of the respondents (16.6%) admitted their readiness to leave garbage right on the scene.

Another situation offered to respondents is cleaning up the garbage in parks and recreation areas made by themselves after a walk or picnic. The coastline of the Northern Dvina embankment, a street along the river where the city is located, is used by residents as one of the most popular recreation areas during warm seasons. Therefore, various kinds of garbage often leave on the banks of the river: glass and plastic bottles, plastic and foil bags, aluminum cans and others. Research participants were asked how much and how often they cleaned up the remaining garbage made by themselves. Three alternatives were offered: cleaning up only your own garbage, cleaning up both your own and someone else’s garbage if stayed, and finally is leaving the garbage on site. The diagram in figure 3 shows the response distribution.
More than a half of the research respondents clean up only their own garbage. Quite a high proportion of those who are ready to clean up all garbage. And only 3.0% admitted to leaving garbage made by themselves. Such picture does not correspond to the fact that there is constantly a high proportion of garbage left in recreation areas during warm seasons. Therefore, this issue requires further study using observation methods and sociological experiment.

Further, the sociological research analyzed the opinion of the population regarding the readiness to garbage separation.

Respondents were asked questions about whether they understand the importance of garbage separate collection, and whether the residents of Arkhangelsk share the garbage now. The comparison of the results is demonstrated in the diagram in figure 4.

The graphs show that in the future the research respondents are ready to separate garbage more than they do it now (34.5% of all respondents). And at the moment, more respondents have expressed
their discontent for garbage separation, than reflected in their willingness to garbage separation in the future (24.7% of all number of respondents).

When analyzing the results of the survey on the readiness of residents for separate garbage collection, it is important to note that there is no actual garbage recycling plant in Arkhangelsk and the Arkhangelsk regions. There is a mill called a garbage recycling mill, but in fact it is only a wire netting belt where wastes are divided into fractions, and afterwards, the garbage is either sent to a landfill (if it is not recycled garbage) or transported to other regions (if it is recycled one). The Arkhangelsk garbage recycling mill takes paper, glass, aluminum and only some types of plastic to be sorted. Containers of this mill are located not in every area of Arkhangelsk, there are only 248 such containers in the city [6] for the number of 348,343 people according to the data in 2019 [4]. The total area of the city is 294.4 square kilometers, so, one container for separate garbage collection is for 1,405 people and is situated in area of 1.2 square kilometers. It is important to take this data into account when analyzing the received data.

The main conclusions were highlighted in the course of this sociological research.
1. Residents of Arkhangelsk consider their city to be dirty: more than a half of the research respondents rated the cleanness of the city on a scale of 1 to 10 from 1 to 3 points.
2. Residents of Arkhangelsk identify a number of reasons why there is such a low assessment of the city cleanness. They attribute a low efficiency of the municipality to these reasons in their answers. The respondents of the research also recognize personal responsibility for the condition of the city.
3. The most common garbage category is food waste. The next rank is plastic, paper, metal and glass. The bulk of purchased plastic is product packaging. The number of purchased bottles for drinks and bags for placing purchased goods is less significant in volume. The research participants showed that some of them have already refused to purchase packages (35.4%) and plastic bottles (34.6%). Residents also tend to reduce the amount of plastic they buy at grocery stores by reducing the number of bags and plastic bottles they buy, but this trend has not become a widespread yet.
4. More than a half of the participants in this research showed readiness to pocket the garbage appeared during the walk and throw it away later (55.6%) or to spend time searching for a container or litter bin (27.7%). However, a small proportion of the research participants (16.6%) admitted their readiness to leave the garbage on the land right on the scene.

After walk or barbeque, more than a half of the respondents of the study noted that clean up only the garbage they made themselves (54.0%). There is a high proportion of those research participants who are ready to clean up all garbage (43.0%). At the same time, there is a small share of respondents who leave the garbage after themselves (3.0%).
5. In the future, the residents of Arkhangelsk are ready to separate garbage to a greater extent than they do it now. Today, only a fifth part of the research participants separate garbage constantly. It should be noted that today it is done in the absence of containers for separate garbage collection in every yard of dwelling house.

The research has shown that the share of inhabitants of Arkhangelsk is ready for changing and realize the degree of their responsibility for the ecological situation in the city. Nevertheless, the problem of mass public enlightenment on the importance of the changes that garbage reform brings, as well as on individual responsibility for maintaining environmental balance in nature, seems to us to be extremely important, urgent, relevant and needs to be resolved as soon as possible.

References
[1] Arctic region.UN environment programme Available from: https://www.unenvironment.org/explore-topics/oceans-seas/what-we-do/working-regional-seas/regional-seas-programmes/arctic-region [Accessed 18 February 2019]
[2] Protests in Shiyes: How a Garbage Dump Galvanized Russia’s Civil Society. By Yelena Solovyova The Moscow Times Available from: https://www.themoscowtimes.com/2019/07/06/protests-shiyes-how-garbage-dump-galvanized-russias-civil-society-a66289 [Accessed 7 January 2020]
[3] Russians, Feeling Poor and Protesting Garbage, Suffer Winter Blues *The New York Times* Available from: https://www.nytimes.com/2019/02/19/world/europe/russia-putin-landfill.html [Accessed 8th January 2020]

[4] Arkhangelsk Available from: http://города-россия.рф/sity_id.php?id=50 [Accessed 19 February 2019]

[5] Map of waste disposal sites of Russia Available from: https://kartasvalok.ru [Accessed 16 November 2019]

[6] Containers for recyclable material Arkhangelsk Available from: https://2gis.ru/arkhangelsk/search/контейнеры%20вторсырья?m=40.649414%2C64.520614%2F12 [Accessed 21February 2020].

[7] Larionova N S 2019 The problem of sensitive questions and solution approach *Colloquium-journal № 27-6 (51) 56-59*