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**Nudging as Policy Tool of Local Government
for Improving the Ecological Behaviour**

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Abstract

The Romanian efforts for implementing waste management started in 2003, with the elaboration and implementation of the National Waste Management Strategy, as a result of the transposition of the European laws and according to the Emergency Government Ordinance no. 78/2000 on the regime of waste, as Romania was preparing the accession to the European Union. In order to align the Romanian laws regarding waste management with the EU laws, the Ordinance no. 74/2018 brought several changes regarding the selective collection of municipal waste.

Romania has a very low waste recycling rate and the objective of the paper is to find efficient tools for influencing the behaviour of citizens regarding environment. In order to encourage the good behaviour of citizens, nudging can represent an efficient tool because lets the freedom of choice while the action is guided in a soft way by a pattern.

At national level, the total quantity of waste per capita decreased from 383 kg/capita in 2005 to 272 kg/capita in 2018. At European Union level, the total quantity represents 489 kg/capita, but the recycling rate is 47.1% in 2018, compared to Romania, of only 11.1%.

Municipalities are responsible for the collection and management of waste, but still, generation and recycling of the waste are the responsibility of all stakeholders, including the citizens. Therefore, the citizens have an important role in increasing the recycling rate and nudging represents an important tool that local governments can implement in order to increase the awareness and responsibility for environment.

The paper presents the results and impact of a pilot project implemented in the 1st District of Bucharest, which uses nudging as a policy tool for influencing citizens for a better selective collection of the waste. The estimative cost of the project is EUR 14,000 with a treatment applied to 25,000 inhabitants (10.5% of the total population of the 1st District).

Keywords: nudge, behaviour, waste management.

JEL Classification: Q5

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1. Introduction

All public institutions deal with public policies, public rules and public tools. The main goal of public institutions and especially of the local authorities is the welfare, a better life for the citizens that they deserve. Once a policy is developed, it must be administrated and implemented and usually this is a long process, it needs good resources, and good administration capabilities. Also, a good implementation depends on the responses of the target players. These target players can be formal organizations or can be ordinary citizens whose compliance with the policy is targeted. An improper implementation of a policy is when the target players may respond to policies in unexpected ways. (Thaler, H. Richard and Sunstein, R. Cass: Nudge, 2009) [5].

Behavioral economics, in contrast to traditional economics, has nuanced our way of interpreting human behaviour (Hummel and Maedche, 2019) [2]. In order to achieve the welfare and create added values, local authorities are trying to use some specific tools for improving decisions for different areas. One of the new tools which are used is defined in literature as Nudge. As citizens, communities and policymakers, we want to stop “bad behaviours” and we want to encourage “good behaviours”, such as: volunteering, voting, and recycling. We, as consumers, sometimes want a little help to “do the right thing” for the “common welfare”. But firstly, it is important to define the “right things”, to answer to questions like who will benefit from doing the right thing? Answers like to save a little more, eat a little less are values for us, recycle more can be a value for the entire society – though we may be ambivalent about how aggressively we want the State to intervene in these behaviours. (Thaler, H. Richard and Sunstein, R. Cass: Nudge, 2009) [5]. Sometimes we can agree on how we would like policymakers to change our behaviour – and sometimes they “nudge” in those directions. But other times, those nudges have unintended consequences.

2. Importance of Nudging for Local Government Reinforcement

As behavioural scientist Thaler (2009) says “Public and private data alike will become more transparent”, says behavioural scientist Richard Thaler. That’s an opportunity for some companies and a threat for others. For the public sector, it is mandatory to become more transparent. But how the public sector should change the bad behaviour in a good behaviour? How can it determine citizens to change their behaviour? According to Harvard Business Review of June 15th, 2018 “In particular, behavioural economics – that marriage of economics and psychology that has put terms like “nudge” into the popular lexicon, has provided a powerful tool for changing, in the form of the default enrolment”[3]. Nudge is about choices, how we make them and how we can make better ones. Authors Richard H. Thaler and Cass R. Sunstein offer a new perspective on preventing the countless mistakes we make, including ill-advised personal investments, consumption of unhealthy foods, recycling, and other bad decisions. They argued that since people are such bad decision makers, we should nudge them in the direction of their own desired goals

by orchestrating their choices so that they are more likely to do what achieves their ends [5]. Citing decades of cutting-edge behavioural science research, they demonstrate that sensible “choice architecture” can successfully nudge people towards the best decisions without restricting their freedom of choice.

The “libertarian-paternalistic” concept is also mentioned by David Halpern, the BIT manager in his book, *Inside the Nudge Unit – How Small Changes Can Make a Big Difference*. We need our freedom when we make decisions, but we have to be in a soft way controlled by a pattern. Also, it is good to know that the nudge has no coercive component; it only influences decisions in the easiest way [4].

When applying a new policy, the public administration has to take into consideration the outcomes that the new policy will provide. From practical experience, we know the public institutions spent considerable sums of money for implementing the policies, but very often the outcomes are insignificant. Using the nudge, we want to have value for the money that we spent. Changing, influencing the behaviour is attractive because it offers a better outcome at less cost. Influencing people’s actions is not new; at the origins of the bureaucratic approach, the administration has often used different tools like laws, internal procedures, and regulations to achieve the desired outcomes. But the current challenges for the authorities in the health system, environment and tax regulation can be resolved if we try to influence people’s behaviour, people’s habits, their lifestyles.

All economic and psychological theories developed over the past 15 years are extremely useful in understanding and solving the needs of inhabitants. If the behavioural theory is deployed, our duty as public administration is to try to apply it. For doing this, we need to find innovative solutions in order to build the administration capacity to be open to use and to implement the theory, to identify the type of decisions to respond to nudge. Thaler and Sunstein point out certain types of decisions to respond to nudges well.

- Delayed Consequences Decisions – where the impact of the decision (or non-decision) and its consequences are separated in time (such as smoking now and the risk of lung cancer manifesting later).
- Complex Decisions – where there are many variables to consider in the decision, such as choosing the right health care insurance.
- Overwhelming Decisions – when there are too many choices, or the choices are unfamiliar, such as which exercise routine is best for you.
- Low Feedback Decisions – where there is no obvious feedback from the decision, such as taking vitamins every day.
- Infrequent Decisions – where the decision points come up very rarely, such as choosing between surgeries, medicines or other treatment options for a diagnosis. Decisions like these are the best for nudging. (Thaler, H. Richard and Sunstein, R. Cass: *Nudge*, 2009) [5].

With all theories deployed in Europe, the first steps have been done with a behaviour change summit in May 2009, which brought together officials across governments, economic external experts, etc. All those involved have understood

that “Influencing behaviour is central to public policy”. The Nudge is one of the tools from the “influencing behaviour” field. At present, we find the use of this tool in countries such as UK (UK Department for Environment, Food and Rural Affairs; UK Department for Social Development; UK Department for Transport; UK Department for Work and Pensions; UK Department of Energy & Climate Change; UK Department of Health; UK Financial Conduct Authority), Germany, Austria, Belgium, Croatia, the Czech Republic, Greece, almost in all EU. In each country, there are units or departments which are in charge with influencing behaviour. For all these reasons, we consider the topic relevant for this thesis; practically we have the theory, the method, the context and the needs (Hammerschmid G. (advisor), Munteanu R. A.) [1].

3. Study Regarding Awareness of Citizens for Waste Management

The establishment of a sustainable waste management system remains a tough task for many governments, especially in developing countries that are experiencing rapid urbanization, with limited financial resources available for investment; promoting waste source separation is one of the policy priorities for public authorities for developing countries undergoing an extremely rapid expansion in waste separation. (Zhijian Zhang, Xueyuan Wang, 2020) [6].

We tried to build a team not necessary consisting of experts, but of people with strong skills in public administration, in communication and technical staff from the waste management field. We tried to implement the concept “design thinking for a better common welfare”. We know that in public institutions there is a fixed scheme of employees, an organizational chart, and the employees do not want to be involved in activities which are not related with their daily job duties. There is a lack of openness to new ideas. The degree of innovation is very low in our public institutions.

Next step was to extend the team with staff from RP Company (RP Company is responsible for the sanitation within the local administration) and from other departments of the City Hall. Then, we prepared a meeting room very close to the smoking room, more friendly compared to the offices. We intended to create a relaxing working atmosphere, to have something different than the daily job life in order for members of the team to enjoy being part of the project. In this way, we built a team consisting 16 persons [1 economist (the undersigned), 1 corporate social responsibility (from RP), 1 sociologist responsible for data analysis, 1 specialist in communication, 2 technical experts (RP), 10 persons from different departments which are well in contact with citizens (from the City Hall)].

We were thinking to encourage the bureaucrats to increase their creative confidence and vision, in order to overcome the rigid approach. We can develop small projects based on evidence-based analysis, by focusing on how to facilitate the spread of best practice models. As Hammerschmid G. (advisor) and Munteanu R. A. present in 2018, the main steps of the project are the followings: [1]:

A. Defining the outcome was the next step for our project.

Our first goal was to increase the quantity of recyclable garbage using the EAST tool and the RCTc method. We have also defined secondary outcomes, such as:

- to set up a new way of making the selective collection, helping the citizens in the process.
- to develop a map of the current status of the selective collection; to identify the roots of the problem;
- to improve the quality of life and health through a cleaner environment.

The EAST model has been developed by the BIT – Behavioural Insight Team since early 2012. The model is presented by BIT in their publication and also in the book “Inside the Nudge Unit - How Small Changes Can Make a Big Difference”, David Halpern, 2015. In the analysis of the model, we will follow, mainly, the book. If we, as policy makers, want to encourage behaviours, let’s make it EAST – Easy, Attractive, Social and Timely. These four simple ways of action are based on the BIT’s work. After the development of the MINDSPACE model, they decided to develop an easier one. We consider that the model is for “beginners”. With the EAST model, the BIT tried not to reflect all complexity and details, they focus on effective behavioural approaches.

B. Understanding the context

From the City Hall perspective, the context is clear. Two years after the new regulation was put in place (in force), the recycle waste quantity is still low, and the City Hall pays the tax for the garbage for all citizens. The budget spent by the municipality/tonne of non-recycled garbage is still very high. In the 1st District, there are the following types of buildings: private Rhouses; multilevel buildings (block of flats) – with 2-4 floors without elevators; multilevel buildings – with 5-12 floors with elevators.

Therefore, for the land fill, there is a truck which has to meet a collection schedule in a specific area then the quantity of the collected waste is weighted and stored to the landfill. Also, for the recyclable waste (all in one – paper, glass and metal), there is other garbage truck, different from the landfill truck. After the collection process, the recyclable waste is also weighted and stored to the dry fraction sorting station. The schedule is the following: For multilevel buildings, three times per week on Monday, Wednesday and Friday for landfill. On Wednesday, an extra garbage truck is provided for recyclable waste. For private houses, there are specific days for specific geographic areas and for recyclable waste, every two weeks.

C. Building intervention as the main part of the project

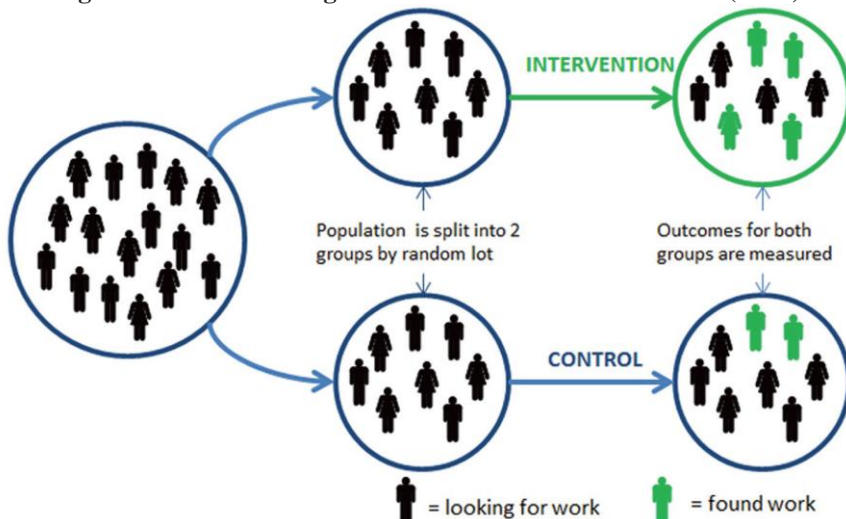
We will design the intervention, which consists of:

- a. Designing the choice architecture for improving the way of making the selective collection;
- b. Designing a new A3-size poster with a message in compliance with the behavioural economic theory and with the request from point a). Designing all complementary materials, such as: A5-size flyer, stickers, and outdoor banners 6 x 1 m;

- c. Designing the support materials, such as: field work sheets, agreement on the dissemination of materials signed by representatives of the landlord associations;
- d. Establishing the citizens (the buildings) targeted through the RCTs methodology.

Randomized Controlled Trials (RCTs) is the way to determine whether a policy is working. The RCTs is the main methodology used by Behavioural Insight Team. The novelty of the method is the possibility to compare the effectiveness of a new intervention against what would have happened if nothing would have been changed. The introduction of a control group eliminates the biases that normally complicate the assessment process. In the example “back to work” proposed by BIT, we can see that those who received the back to work intervention (“Treatment”) were much more likely to find a job than those who did not. Because we have a control group, we know that it is the intervention that achieves the effect and not some other factor. This method, with the proper academic input, can be much cheaper and simpler to implement.

Figure 1. The basic design of a randomized controlled trial (RCT)



Source: adapted from Hammerschmid G. (advisor), Munteanu R. A. (2018), p. 49, The Use of Nudge at Local Government the Case Study – How to Influence the Citizens from 1st District – Bucharest City Hall to Collect Garbage in Two Fractions, “Dry” and “Wet”

While applying the RCTs, we need to know which of the two or more interventions is the most effective in attending a measurable outcome. By randomly assigning people to groups, we can eliminate the possibility of external factors.

- e. Setting up the intervention teams, setting up the schedule with the representatives of the buildings selected in the pilot project programme, each meeting will take place in the street close to their buildings; The buildings selected in the programme will be with 10 floors and 4 floors; Setting up the schedule with the citizens which are living in individual houses (private houses);

- f. For those representatives who couldn't attend the first round of meetings, we will set up a second round of meetings in the City Hall Council room;
- g. Collecting the data after the treatment;
- h. Data analysis;
- i. Decision-making process regarding adjusting or not the message and scaling the campaign; the points g, h, i will be developed in the Test, Learn, Adapt area.

Our focus is on the “dry fraction”, the recyclable waste, according with our main outcome “to increase the quantity of recyclable waste”. Of course, we will also take into consideration the landfill, but we will measure (the weight) only for the collected recyclable fraction.

We decided to test the new choice architecture and the new message on more than 10% of the population of the 1st District. We randomly chose four programmes of garbage collected developed by the RP Company. For each programme, one garbage truck is allocated and the quantity collected is weighted. Therefore, we have individual programmes with individual trucks with weighted quantities of dry garbage. We had the intervention at the level of the buildings which are part of these randomized programmes (randomly selected). The quantity of “dry fraction” was weighted and monitored during 10 weeks, between 18.10.2017 – 20.12.2017. The control group represents other 10% of the population of the 1st District, where there is no intervention for the control group, only the old message. We will also weigh the quantity of the garbage collected from the control group during the 10 weeks of the same period. Then we will compare the quantities collected from individual programmes and the total quantity from all four programmes.

We have randomly selected four intervention (treatment) programmes:

Pr. M01 AP_AL; Pr. M14/MN AP_AL; Pr. M23 AP_AL; Pr. M01/22 CASNIC.

In total, there are:

- 302 multilevel associations from a total of 1,644 (the residential buildings with up to 4 floors and 5 to 12 floors);
- 25 streets with 1,223 postal numbers of individual houses;
- Total targeted population for the “treatment”: 25,063 persons, which is about 10.5% of the total number of inhabitants of the 1st District.

We have randomly selected four control programmes:

Pr. M05 AP_AL; Pr. M10 AP_AL; Pr. M38 AP_AL; Pr. M06 CASNIC.

In total, there are:

- 307 multilevel associations (the residential buildings with up to 4 floors and 5 to 12 floors);
- 22 streets with 1,253 postal numbers of individual houses;
- Total targeted population for the “treatment”: 25,304 persons, which is about 10.5 % of the total number of inhabitants of the 1st District.

Table 1. Main results regarding the implementation of the four programmes

I	II	III	IV	V (total I-IV)
AVERAGE (CONTROL) 1,502	AVERAGE (CONTROL) 2,524	AVERAGE (CONTROL) 1,980	AVERAGE (CONTROL) 256.7	AVERAGE (CONTROL) 2,002
AVERAGE (INTERVENTION) 1692.1	AVERAGE (INTERVENTION) 2,470	AVERAGE (INTERVENTION) 2,344	AVERAGE (INTERVENTION) 343.3	AVERAGE (INTERVENTION) 2,168.7
GROWTH 12.66%	GROWTH -2.14%	GROWTH 18.38%	GROWTH 33.77%	GROWTH 8.33%
Gross Difference 190.1	Gross Difference 54	Gross Difference 364	Gross Difference 86.7	Gross Difference 166.7
Variance (Control) 34,173.3	Variance (Control) 27,626.7	Variance (Control) 692,800	Variance (Control) 13,186.7	Variance (Control) 414,520
Variance -Intervention 26,957.4	Variance - Intervention 107,044.4	Variance - Intervention 393,760	Variance -Intervention 13,666.7	Variance -Intervention 28,401.6
Std. (Control) 175.4	Std. (Control) 157.7	Std. (Control) 789.63	Std. (Control) 104.8	Std. (Control) 633
Std.(Intervention) 155.8	Std.(Intervention) 310.4	Std.(Intervention) 595.30	Std.(Intervention) 106.7	Std.(Intervention) 524
t-Test: Two-Sample Assuming Equal Variances				
Observations 10	Observations 10	Observations 10	Observations 6	Observations 30
Hypothesized Mean Difference 0	Hypothesized Mean Difference 0	Hypothesized Mean Difference 0	Hypothesized Mean Difference 0	Hypothesized Mean Difference 0
df 18.0	df 18	df 18	df 10	df 58
t Stat -2.4	t Stat 0.47	t Stat -1.10427	t Stat -1.30 P(T≤t)	t Stat -1.09 P(T≤t)
P(T≤t) two-tail 0.03	P(T≤t) two-tail 0.65	P(T≤t) two-tail 0.28	two-tail 0.22	two-tail 0.28

Source: adapted from Hammerschmid G. (advisor), Munteanu R. A. (2018), pp. 55-60, The Use of Nudge at Local Government Level. Case Study – How to Influence the Citizens from the 1st District – Bucharest City Hall to Collect Garbage in Two Fractions, “Dry” and “Wet”

The first two programmes developed for the multilevel buildings (I) show that the Intervention increased by 12.66% compared to the Control group. The gross difference is 190 kg, the difference between average. The absolute difference between the two programmes is 1,901 kg. The standard deviation 155.8 is low; we can conclude that we have valid data. Testing the null hypothesis, the $P(T \leq t) = 0.03$ shows us that the increase by 12.66% is real in a proportion of 97%. ($100 - 0.03 = 97$). We can conclude for this programme that 97% of our increase by 12.66% is real but we consider that we have a small quantity of data.

The second two programmes (II) developed for the multilevel buildings (II) show that the Intervention decreased by -2.54% compared to the Control group. The gross difference is (-54 kg), the difference between average. The standard deviation 310 is too high. Testing the null hypothesis, the $P(T \leq t) = 0.65$ shows that the data is real in a very low proportion, of 35%. We can conclude that for this programme the data is not valid or maybe the pair is not well matched, but from a statistical point of view, the treatment didn't work. Splitting the programmes in this way could be unrepresentative. But for us, as a policy maker, it is a question mark and we will have a double check regarding the steps which have been doing during the implementation phase. It is part of the learning curve.

The third two programmes developed for the multilevel buildings (III) show the for the Intervention group an increase by 18.38% compared to the Control group. The gross difference is 364 kg, the difference between average. The absolute

difference between the two programmes in 3,640 kg. Testing the null hypothesis, the $P(T \leq t) = 0.28$ shows us that the increase by 18.38% is real in a proportion of 72%. We can conclude for this programme that 72% of our increase by 18.38% is real but we consider that we have a small quantity of data. It is an increase unconfirmed from a statistical point of view, but we have an increase in absolute data with 3,640 kilos.

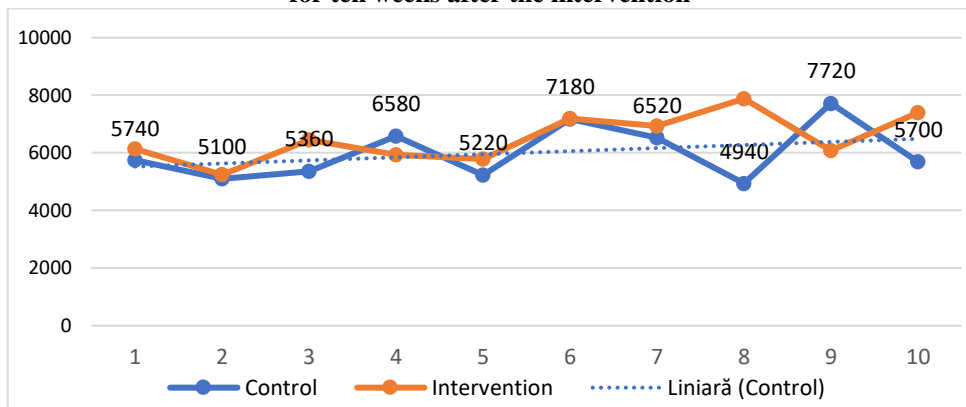
The fourth two programmes developed for private houses show from the first day of our intervention in the streets and meetings with private house owners we have organised that something is going completely wrong with the collective selection of the garbage in the private houses. For the private houses, we didn't change the day of collecting the dry fraction, we kept it the same day as it used to be. Our proposal of intervention was to nudge citizens to realize that the process of collecting is not very complicated; we wanted to give them support and to understand where the problem was. The biggest surprise was from the citizens from 25 streets and 1,223 of postal numbers; we collected the recyclable garbage only from 55 postal numbers. Only 55 postal numbers had the green garbage bin outside of their courtyard. When we discussed with people why they did not put out the bins, they answered that they did not know that Saturday was dedicated to recyclable garbage. They had two garbage bins, one brown and one green, but they put all together and delivered to the RP Company in the day dedicated for wet fraction. In our opinion, this is a fundamental problem and all of this because the bill is paid by the city hall not by the citizens.

The data collected through the private houses programme is available every two weeks, according to the programme developed by RP Company. After we have collected data from the private houses, we understood that there is a real problem of choice architecture, a huge problem of communication and a gap between the services delivered by the RP Company and the amounts paid by the city hall. For private houses, at that time there were 20 programmes designed for collecting the dry fraction with 20 small trucks in charge with collection. With that volume of the recyclable waste provided by the citizens from private houses, in our opinion, is more likely to do it with 5 trucks. In this part of testing, learning, adapting, we realized that for the private house it is not a real problem of influencing behaviour in a certain way and it is a "Big Mistake", as Cialdini defined. We also have determined that only 4.5% from our target groups knew about the specific day allocated for the dry fraction. For these reasons, we decided to develop a set of recommendations regarding the private houses programmes and not to include the data collected in our final analysis because it was not relevant for our main goal, to nudge people for a better collective selection. But it is very important to know that with our pilot project we could understand that the problems, the mechanism and the information collected in the pilot project for private houses are basic evidence for the next steps which the city hall has to implement.

The fifth programme, the Global Analysis without the Private Houses Programmes (V). In the global approach for all programmes implemented for multi-level buildings, the Intervention shows an increase by 8.33% compared to the Control group. The gross difference is 166.7 kg, the difference between average. The

absolute difference between the two programmes is 5,001 kg. The standard deviation 524 is not so high compared to the Mean (2,168.7); we can conclude that we have homogeneous data. Testing the null hypothesis, the $P(T \leq t) = 0.28$ shows that the increase by 8.33% is real in a proportion of 72%. From a statistical point of view, the data can be hardly acceptable, but it is clear that we have an increasing trend of the recyclable waste. We used the null test to also have a statistical approach of all processes; having the absolute data, we can consider that these are basic evidence for our project.

Figure 2. Evolution of the dry fraction collected for ten weeks after the intervention



Source: adapted from Hammerschmid G. (advisor), Munteanu R. A. (2018), p. 61, The Use of Nudge at Local Government Level. Case Study – How to Influence the Citizens from the 1st District – Bucharest City Hall to Collect Garbage in Two Fractions, “Dry” and “Wet”

Conclusions

One of the main problems regarding the selective collection of waste is an “Overwhelming decision”, due to the fact that citizens have to decide between too many choices and are not complying with the process.

With the behavioural insight approach, we were capable to deliver successful results into a policy which concerns human behaviour. For the 1st District 1 City Hall, it was the first time when it applied the behavioural economic theory in a scientific approach, building a team, developing all processes, including the stakeholders. Through the project, we have been able to develop the learning curve which delivers very valuable information. We have been able to build a strong capacity team for the project which can share the acquired information with other departments from the city hall for other policy fields. The implementation part with testing, learning, adaptation phases brought a strong information input, as it represented the means to optimize the resources and deliver better results. The feedback from the data collected showed us the limitations and the potential of our interventions, and allowed us to explore the steps where behaviour influence can be made more effective. The transparency of the process and communications can

increase the public and political support for behavioural policy initiatives and decrease the scepticism around the topic.

As Policy Recommendations, we propose:

- to develop the “What Works Team”;
- to enhance the communication for implementing the EAST framework;
- to identify and promote the best practice model;
- to implement “*the comfort tax*” for associations which are not doing the waste selective collection;
- to develop an integrated system of waste selective collection;
- to embed the behavioural economics in other city operations.

The development of the pilot project can reinvent the wheel of the traditional Weberian public administration approach into modern public administration related with human behaviour. With the project, we succeed to reach our main outcome to increase the quantity of recyclable garbage using the EAST framework model, to deliver a new choice architecture; we succeed in understanding the problems of the previous mechanism of selective collection and in improving the quality of life insuring a cleaner close environment. We consider that behavioural economics is working at the level of the local government, that this first attempt can be developed across public institutions, given that the awareness about behavioural economics policy will grow and more relevant information will become available.

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