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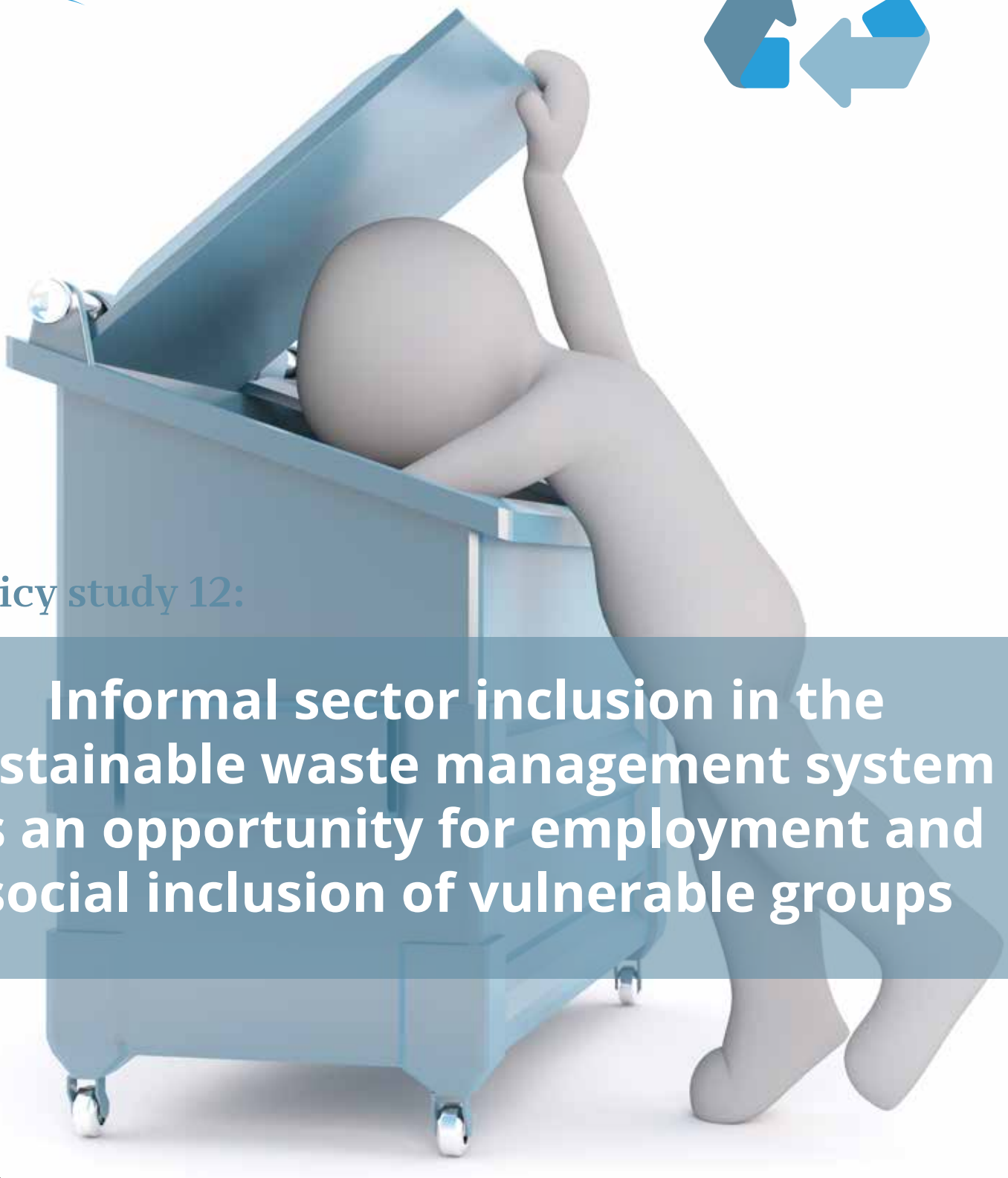

Policy study 12:

Informal sector inclusion in the sustainable waste management system as an opportunity for employment and social inclusion of vulnerable groups

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OUT OF THE BOX

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* "The content of this Study does not necessarily reflect the opinions of Reviewer."

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Executive summary

The main research objective was to present the nature of informal waste management, costs and benefits for the society from the work of the informal waste pickers, as well as to propose a sustainable model for inclusion of the waste pickers in a formal system which would ensure improved quality of life through their employment, health and social insurance, children's education, and occupational safety and health.

It was important for us to understand the relations between national authorities, local authorities, and the business sector with the informal waste pickers. This was particularly important considering the risks and problems arising from the waste management modernisation in Macedonia, since both access and rights of informal pickers are limited in terms of valorising recycling materials. They are generally aware of the problem; however, they feel powerless to influence changes.

All stakeholders have presented increased interest for formalisation of waste pickers, by being aware that they are the key link for encouraging recycling and other forms of waste processing in Macedonia. From the field research conducted, as well as the numbers on the waste pickers' contribution, it can be concluded that this is a vulnerable group of citizens with limited knowledge of the different methods for their organisation and waste treatment. The low educational level, accompanied by the closed nature of the community, contributes to the low institutional knowledge and skills which would assist the independent resolution of their problem. Unfortunately, it is highly unlikely to expect that changes and their formalisation would originate from within the community.

It is necessary to extend the debate on the informal waste management sector through verifiable economic information on its impact, since this would contribute to perceiving the benefits, and their formalisation would be supported by all relevant factors, mainly the national and local authorities.

Table of Contents

1. Introduction

This document contains the results of the analysis on the topic "Informal sector inclusion in the sustainable waste management system as an opportunity for employment and social inclusion of vulnerable groups". The objective of the analysis is to identify the possibilities and challenges in the creation of an enabling environment for inclusion of the informal sector in the waste management system. More specifically, the tasks of this analysis are as follows:

- Establish the potential to reduce costs when applying sustainable waste management methods;
- Establish the current functioning method of informal pickers and their impact;
- Establish the possibilities and challenges to include this group of citizens in the waste management system which would produce an impact on the improvement of the material and social status of this vulnerable category of citizens and improvement of the environment situation.

Methodological approach

This research uses an approach that analyses the current functioning method of the informal waste picking in Macedonia. In addition, comparison is made of the formal and informal waste management and the valuation thereof. The analysis maps, measures, models, and monetises both costs and benefits from informal activities, by including direct costs and benefits, as well as other socio-economic impacts. Potential impact of formalised actions of waste pickers is analysed through scenario modelling. The proposed formalisation model provides an answer to the question: what would be the economic impact on the society, as well as the economic impacts on the formalised municipal waste management system if informal pickers are recognised, supported, and integrated into an organised waste management system.

The analysis uses quantitative and qualitative research approach, as follows:
- Cost-benefit analysis of costs and benefits of current operations of informal pickers, as well as analysis of costs and benefits in case of future sector formalisation when specific conditions are met. This analysis was performed in accordance with the criteria of the following documents:

1. (2005) Guide to Economic Appraisal: Carrying out a cost benefit analysis. The Public Spending Code. Standard Analytical Procedures. Central Expenditure Evaluation Unit in the Department of Public Expenditure and Reform. (Part of the Irish Government Economic and Evaluation Service).
2. Ellen Gunsilius, Bharati Chaturvedi, Anne Scheinberg (2011). Working Group on Solid Waste Management in Low- and Middle-income Countries. Eschborn, Germany: GIZ - German Society for International Cooperation (Deutsche

Gesellschaft für Internationale Zusammenarbeit)
3. (2011) Cost-Benefit Analysis for Environmental Impact Assessment. Damir Rajkovic. Zagreb University, Faculty of Mining, Geology and Petroleum Engineering.
4. (2007) Recycling: Cost-Benefit Analysis. Covec Ltd upon request of the Government of New Zealand.
5. (2010) Valuing the future: The Social Discount Rate in Cost-Benefit Analysis. Melbourne, Australia.
6. (2006) Waste Management. Report no. 38. Productivity Commission. Australia.

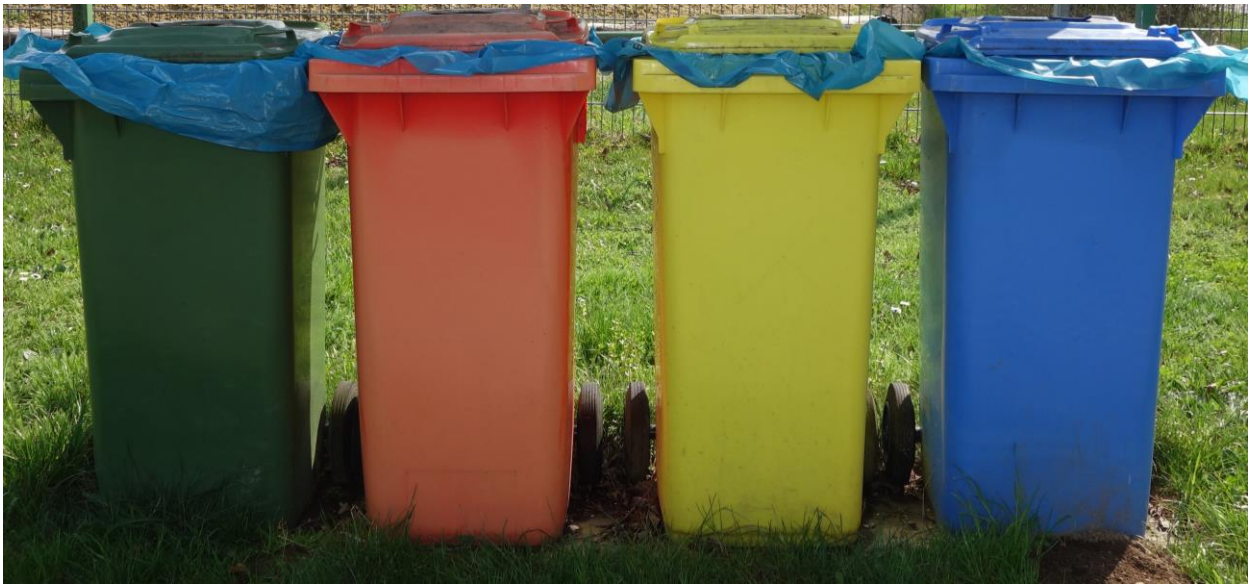
- Analysis of the current situation with waste management, relevant legislation, and different programmes for support of marginalised groups;

The following data collection tools were used for the analysis:

- Interviews with the most important actors divided into several categories: decision-makers at national and local level, waste collection and treatment operators, economic operators for waste management, utilities, Employment Agency, and civil society organisations working with the informal waste pickers;
- Field survey with informal waste pickers. Questionnaire was developed for the needs of the field survey, which provided insight into:

a) The socio-demographic features of the target group, that is, the number of household members, number of children and women, housing conditions, access to health and social protection, access to children's education, documentation, and sources of income in the family/household.

b) Insight into their daily activities related to waste picking: types of waste, quantities, areas, prices and markets; number of family/household members included in the picking activities and revenue from waste picking.



2. Informal Waste Picking in Macedonia

Waste is one of the most considerable environmental problems in Macedonia. Annually and per capita, about 376 kg of waste are generated or total of 796,585 tonnes; however, the total quantity of collected municipal waste amounts to 610,227 tonnes. The difference between the total collected and total generated waste ends anywhere in the nature. The landfill situation is not satisfactory; out of 54 landfills, only the "Drisla" landfill meets specific minimal standards; however, it also needs significant infrastructure and technological improvements. The percentage of primary selection and primary waste collection is rather low, resulting in low percentage of recycling and other forms of processing.

Waste from packaging has high economic value, and it accounts for 15% to 22% of the total municipal waste quantities. In Macedonia, citizens on average generate about 50 kg per capita at annual level of packaging waste or about 115,000 tonnes (Ivanovski et. al, 2016). Most of the packaging waste is a resource with market economic value.

The participation of the so-called informal sector is significant in the primary waste collection and selection. Individuals and families who valorise parts of waste through activities which are not organised, recognised, taxed (except partially for the personal income tax) and monitored by the official authorities responsible for waste management in the country (Gunsilius et.al, 2011) can be considered as informal waste collection sector in Macedonia. Unlike other countries with waste pickers, Macedonia has no forms for their organisation into a cooperative, social enterprise, small enterprise, or employment in a utility.

There are several main forms for waste valorisation by the informal pickers in Macedonia. First, they are focused on picking and selecting recycling materials from waste containers for mixed municipal waste or landfills. The second form is waste picking for personal and commercial use through use of picked materials for warming of their homes or sale of materials which could be reused or fixed and sold at both formal and informal markets in Macedonia. The third form is picking of extra food for feeding the family and the animals they keep.

It is important to mention that these are often marginalised groups living at the edge of existence. In different socio-economic conditions in Macedonia, the earnings from municipal waste recycling materials would be assets for the utilities or other entities; however, these materials are currently a non-formalised social programme which provides means for living of 3000 to 5000 citizens[1]. On average, 3000 persons[2] are engaged with informal picking daily. However, considering that this is an unstable activity, they frequently engage in other work activities; therefore, they revert to collection of recycling waste materials only when they have to. Therefore, formalisation of informal pickers essentially means formalisation of a different social programme.

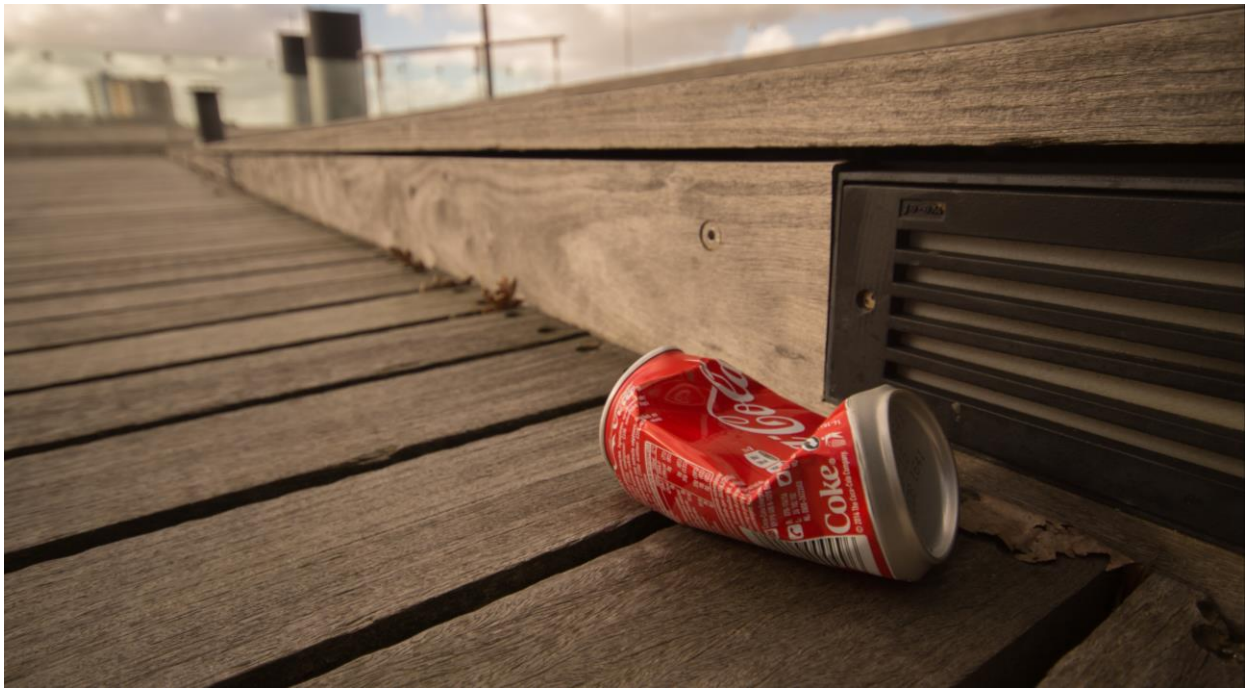
Health consequences are also negative externalities from informal waste picking. Informal waste pickers are often subjected to injuries since they most often lack the

[1] The number is obtained by means of calculating the total quantities collected by the informal pickers in Macedonia and dividing them by the individually collected quantities per informal picker. At the same time, the research of (2009).MDC-Ti.Net resulted in similar numbers (page 11). Website visited on 15 June 2016). www.mdctinet.org.mk/en/projects/data/pet.html.

[2] This claim is produced according to our calculations of the revenues and quantities of collected waste.

access to hygienic or health means, such as: protective equipment, washing means, medical equipment etc. There is significant room for improvement of their conditions and access to protective and health services; however, it can reduce the cost-effectiveness of their activity due to the low quantities which are currently individually picked by them. They currently act in a non-registered, informal manner, which makes them vulnerable to competition and subjected to exploitation. Therefore, many of them would like to be recognised and formalised, pay taxes, although they do not know how to make this change.

According to the assessments of the collective packaging waste handlers, about 80% of the packaging waste being recycled in Macedonia is collected and selected by the informal waste pickers; the problem is the lack of separate records of the exact quantities originating from the informal pickers. If one takes into account that for 2014, collective packaging waste handlers have reported 16,050 recycled tonnes, which means that informal pickers, during that year, have collected and selected about 12,840 tonnes or about 1.82% of the overall municipal waste quantities in Macedonia, whereas for 2015, an increase was observed to 22,719 tonnes[3] of recycled quantities of packaging waste. There is lack of precise records of collected, selected, and recycled waste quantities, resulting in incomplete waste data system in the country, indicating the need for increased control of the state authorities in terms of credibility of reports of all entities acting in the field of waste.



[3]Annual report on environmental quality for 2016. Ministry of Environment. (2017). Website; http://www.moepp.gov.mk/wp-content/uploads/2014/11/2016Vkupen_GodisenIzvestaj.pdf Visited on: 05.08.2017. Skopje

As previously mentioned, within the analysis, field survey was conducted in the period from 15.04.2017 to 28.04.2017 with the informal waste pickers. All 274 surveyed persons were of the Roma community, 80 of which were children who are actively and daily engaged in waste picking activities. Regarding the educational level, 90% of the respondents are without or with unfinished primary education. In terms of the housing status, 95% of the respondents have declared that they possess no property, and only 8% have declared permanent residence. Others live in substandard conditions, and 44% lack the access to water in the immediate surrounding area, and only 10% have toilets in their dwellings. In reference with the health insurance, 30% of the respondents lack such insurance, and accordingly, have no general practitioner. Only 5% of the respondents have two-room housings, and the number of persons with whom they share the housing is between two to twelve. When referring to children included in the informal waste picking, it is important to emphasise that as high as 89% of the children of informal pickers do not attend school.

Table No. 1: Field survey with informal waste pickers – basic data

	yes	No
Owns property	5%	95%
Has permanent residence	8%	92%
Access to drinking water in the surrounding area	56%	44%
Toilet in the dwelling	10%	90%
Health insurance and general practitioner	70%	30%
Children attending school	11%	89%
Cooperation with PUC “Komunalna higiena"	/	100%

survey conducted in the period April – May, 2017

Regarding the question on the types of waste being collected, PET packaging, iron and paper are mostly collected, whereas electronic waste is rather infrequently picked. In terms of quantity, males’ average is 2[4] bags a day, and women collect less or about 1 bag, since children often accompany them and make them less effective in their work.

[4] Informal pickers indicate that, usually, up to 25 kg can be fitted in one “jumbo” bag; however, buyers seldom recognise the entire weight, and usually pay them for 20 kg.

Legal framework

Law on Environment

The objectives of the Law on Environment are as follows: "conservation, protection, renewal, and improvement of the environment quality" (Official Gazette of the Republic of Macedonia 39/15). In accordance with this objective, the Law requires licensing in the fields of waste management and processing. This means that entities active in the field of waste management shall have to prepare an environmental impact assessment. Entities included in the handling and/or processing of dangerous waste have to develop an additional study.

Informal waste pickers undoubtedly contribute to the environment quality; however, they cannot acquire the required licences prescribed by the Law on Environment. The reasons for the previous encompass the low education level and lack of access and knowledge of relevant procedures, as well as the lack of financial possibilities for incorporation of a legal entity which shall enable them to execute their activities within the formal economy.

Law on Waste Management

Law on Waste Management is a standardised EU legal act based on the "polluter pays" principle. This Law requires that waste handlers are licenced for collection, transport, processing, storage, and disposal of waste. Such licenced operators are the only entities authorised for collection of waste materials and they are required to own documentation that verifies the proper disposal of collected waste by the producers.

In accordance with the Law on Waste Management, waste collectors are natural or legal entities with licence to collect and/or transport waste. The existing Law on Waste Management practically does not take into consideration informal pickers. Given the fact that they do not own licences required by the Law, their activities are essentially illegal.

Law on Packaging and Packaging Waste Management

The main objective of the Law on Packaging and Packaging Waste Management is creation of conditions for establishment of a system for returning, selection, collection, reuse, processing, and recycling of packaging waste (Official Gazette of the Republic of Macedonia 39/16).

The Law, as "lex specialis", elaborates the principles of the Law on Environment and the Law on Waste Management, in particular the "polluter pays" principle. Accordingly, each waste generator – producer should act with a view to improving management of packaging and packaging waste. The Law enables the waste producer to choose to handle packaging and packaging waste in one of the three methods: independently; by concluding a contract with collective handlers, or by payment of a fee to the state for each type of packaging waste generated. Pursuant to the Law, collective handlers - operators shall have to meet specific requirements so as to be issued a licence

from the Ministry of Environment and Physical Planning and be registered as collective handlers. The enforcement of the Law and the number of collective packaging waste handlers have varied so far, depending on whether they meet the envisaged requirements prescribed by the Law and the work licences. In addition, it should be emphasised that pursuant to the Law on Packaging and Packaging Waste Management, the so-called small waste producers (established per quantities for each waste type) are exempted from actions in accordance with the Law, which additionally complicates the situation, especially with regard to the accurate records of waste quantities generated. Also, more accurate records can be produced through increased promptness of the inspection authorities in terms of the packaging waste handling by the waste producers.

Waste Management Strategy of the Republic of Macedonia 2008-2020

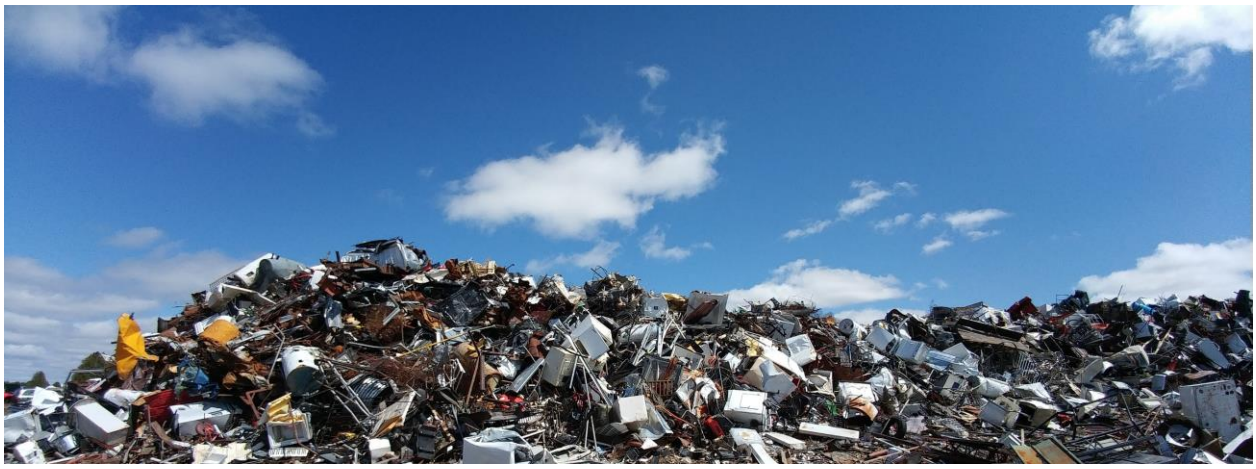
The "Waste Management Strategy" covers the period from 2008 to 2020, and invites the local self-government units to develop local waste management plans (Government of the Republic of Macedonia, 2009). On the other hand, the "National Waste Management Plan", which expired in 2015 and which was not replaced with a new one, sets the objectives for recycling of waste materials (Ministry of Environment and Physical Planning, 2008).

Although the majority of informal waste pickers are Roma, neither the "The Strategy for Roma in the Republic of Macedonia 2014-2020" (Ministry of Labour and Social Policy, 2014), or the "Employment Strategy of the Republic of Macedonia 2016-2020 (Ministry of Labour and Social Policy, 2015) and the relevant "National Employment Action Plan 2016-2020" (Ministry of Labour and Social Policy, 2015) identify or include informal waste pickers as target groups.

Plans and programmes for waste management of the local self-government units

The Ministry of Environment and Physical Planning is the key central-level institution with regard to waste management; however, the responsibilities related to the daily operations in this field are generally decentralised to the local authorities. Relevant activities delegated to the local self-government units include organisation of collection, transport, disposal of municipal waste; supervising the transport and disposal of hazardous industrial waste; and also, another competence of the municipalities is the establishment, financing and supervision of landfills, as well as closing of informal landfills (Ministry of Environment and Physical Planning and the Swedish Environmental Agency, 2011).

Similar to the services for maintenance of green areas or funeral services, the waste collection at local level can also be taken over by a local public utility company, through the public utility enterprises for waste which are obliged to develop a plan, programme and annual reports (Official Gazette of the Republic of Macedonia 95/12). In addition, waste management companies incorporated in accordance with the Law on Packaging and Packaging Waste Management are included in the local-level waste collection.



Costs and benefits from informal waste pickers in Macedonia for the period 2009- 2016

Informal waste picking, as a phenomenon typical for countries with lower GDP level, is the life reality for thousands of our citizens. Latest literature considers that countries with citizens with lower income and where productivity is more dependent on the direct physical force shall have to utilise the openness to reception of the marginalised waste picking groups, since non-formalised activities also contribute to mitigation of poverty and other adverse social phenomena, and also save resources and protect the environment. Our aim was to verify these claims for the case in Macedonia and to measure the results provided by the existing method of functioning in case of non-formalised conditions, and we started with the initial assumptions that such informal actions of waste pickers produce more benefits than costs for our society. Despite the specific expenses of the state for this marginalised category of citizens, we believe that benefits exceed costs. We hope that based on the results obtained, we would be able to set a sustainable model in the future for their formalisation which shall produce even better results.

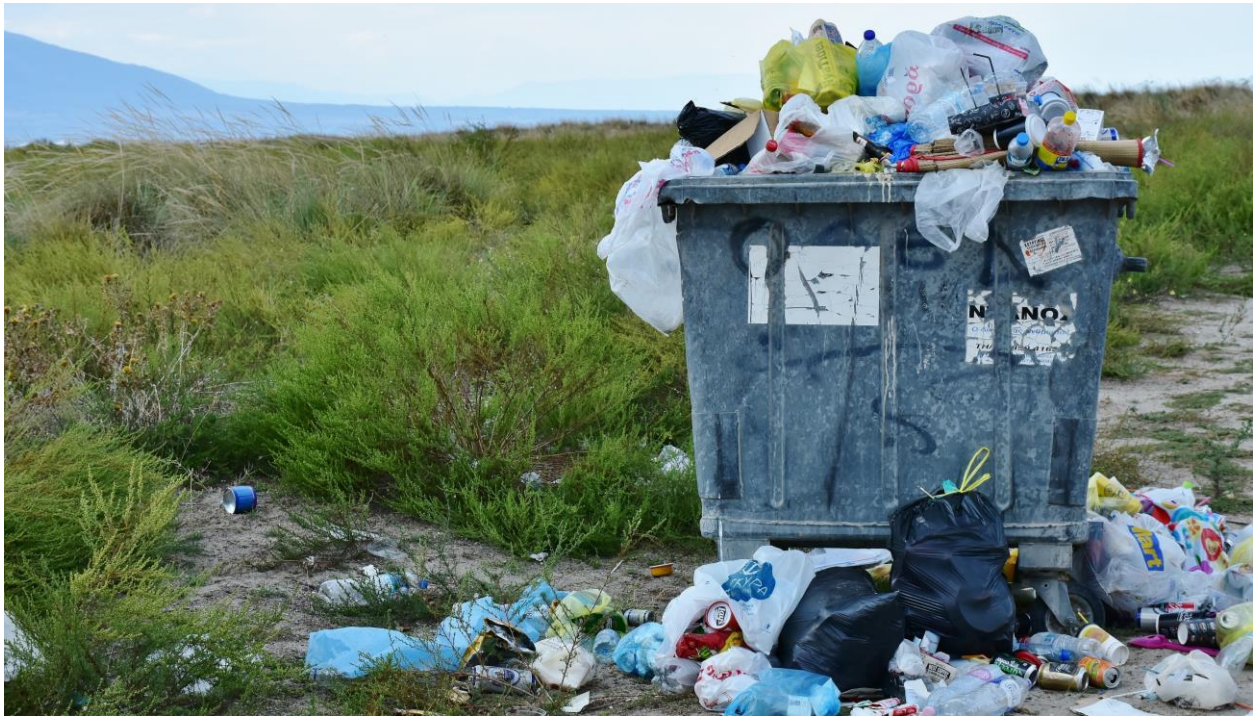
For the purposes of measuring the impact of informal waste picking in Macedonia, we decided to use the cost-benefit analysis method. Costs were divided into direct and indirect. Direct costs were the following: health insurance costs, social welfare costs and costs of informal pickers for maintenance and use of their means for work. Health insurance costs are currently fully covered by the state for about 70% of the informal pickers. Social welfare costs are provided for about 21% of the informal pickers, since for various reasons, this type of revenue is denied to them; therefore, those with social welfare, generate the waste revenues through payments in cash from other informal pickers who record the quantities as their own through transaction accounts. Waste pickers currently use means for work which are very suitable for maintenance purposes and which protect the environment; therefore, they have, on average, 1750 denars of maintenance and transport costs per person on a monthly basis, which include fuel (those with motor vehicles) and replacement of parts for the transportation means. Low costs, inter alia, result from the ability of informal pickers to mostly self-service their work-related means.

Benefits were divided into direct and indirect. Direct benefits were as follows: revenues of informal pickers, revenues of the state from the personal tax paid by the informal pickers and fees for licences paid by the companies to the state for operations with waste which in 80% originate from the informal pickers. Revenues of informal pickers shall be calculated in accordance with the 2015 data of the collective packaging waste handlers as latest official relevant data and they shall be considered as relevant from 2009 onwards, given that the quantities collected by informal waste pickers have not increased, and only the record-keeping process has improved. For 2015, 22,719 tonnes of packaging waste given to recycling were reported, i.e. it can be concluded from the collective handlers' reports that out of the types of waste collected by the informal pickers, paper and cardboard account for 59.89%, plastic for 44.36%, and metal for about 1.47%. In order to calculate the value, mean values shall be used for purchase of selected

waste provided by the recyclers throughout the country, that is, 10 denars on average for plastic, 3 denars for paper and cardboard, and 10 denars for metal. From those quantities, the assumption is that 80% of that waste was collected by the informal waste pickers; Serbia is taken as comparison, since its situation regarding the collection of recycling parts of waste by informal pickers is almost identical to Macedonia. According to the data of the "Serbian Association of Packaging Waste Recyclers", 80% of the recycled quantities, both there and in Macedonia, originate from the informal pickers[5]. In addition, the statement that they collect between 80% and 85% of the packaging waste in Macedonia is also supported by the assumptions of some of the collective handlers, which means that informal pickers take the credit for collection of 18175 tonnes of packaging waste or, expressed in quantities, they have collected 6472 tonnes of plastic, 10328 tonnes of paper and cardboard, and 27 tonnes of metal[6].

Indirect benefits are increasing, and they include: export of waste generated by companies with materials which are 80% obtained from the informal pickers, followed by the new private-sector employments resulting from the waste obtained from informal pickers, and cost reduction of the utilities for collection, transport and disposal of collected and selected waste by the informal pickers.

The benefits which the utilities have in the form of savings of resources for collection, transport and disposal of municipal solid waste are costs of the utilities for the services they offer, which also include transport and costs for employees.



[5] Website: www.asocijacijareciklera.com/index.php/26-srpska-asocijacija-reciklera-ambalaznog-otpada-trazi-izmenu-zakona-o-ambalazi-i-ambalaznom-otpadu Visited on: 10.07.2017

[6]Metal as waste material is still considered as "grey zone" for which there are no real data

	2009	2010	2011	2012	2013	2014	2015	2016
Costs (in EUR)								
Direct costs								
Health insurance costs of informal waste pickers	131,307	131,307	131,307	131,307	131,307	131,307	131,307	131,307
Social welfare costs of informal waste pickers	8,359	8,359	8,359	8,359	8,359	8,359	8,359	8,359
Costs of informal waste pickers for maintenance of their means for work	142,107	142,107	142,107	142,107	142,107	142,107	142,107	142,107
Total direct costs	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**
Total costs	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**	**281,775**
Benefits								
Direct benefits								
Income of informal pickers	1,558,705	1,558,705	1,558,705	1,558,705	1,558,705	1,558,705	1,558,705	1,558,705
Income of the state on personal income tax basis	171,457	171,457	171,457	171,457	171,457	171,457	171,457	171,457
Fees for licences for treatment and storage of electrical waste, waste batteries and accumulators and municipal waste (metal, paper, glass, rubber etc.)	-	6,022	6,022	6,314	6,314	5,583	5,583	5,583
Fees for licences for transport of non-hazardous waste	5,262	5,262	5,262	5,262	5,262	5,262	5,262	5,262
Total	**1,735,775**	**1,741,798**	**1,741,798**	**1,742,090**	**1,742,090**	**1,741,359**	**1,741,359**	**1,741,359**
Effects of increase in production activities in GDP								
Waste export according to tariffs of customs classification (paper, glass, plastic and waste batteries and accumulators)	2,065,140	3,016,828	5,614,601	4,664,826	6,659,661	8,175,610	8,175,610	8,175,610
Total	**2065140**	**3016828**	**5614601**	**4664826**	**6659661**	**8175610**	**8175610**	**8175610**

	2009	2010	2011	2012	2013	2014	2015	2016
Costs (in EUR)								
Direct employment effects in the Republic of Macedonia								
New private-sector employments (through costs for employees through financial reports of CRM - packaging waste handlers)	-	-	54569	85843	116801	142215	142215	142215
New private-sector employments (through costs for employees through financial reports of CRM – electronic waste handlers and handlers of waste batteries and accumulators)	-	-	-	454	4568	9831	10156	10497
Total	**-**	**-**	**54575**	**86307**	**121384**	**152065**	**152371**	**152712**
Indirect effects of processing / recycling of different types of waste instead of their disposal								
Cost reduction for utilities for waste collection and transport, which is collected on their behalf by the informal pickers without any compensation	835664	882562	881429	933756	892496	977465	1009950	1045033
Total	**848094**	**892041**	**934207**	**973202**	**928110**	**1115319**	**1174115**	**1211901**
Total benefits	**4,634,209**	**5,638,390**	**8,288,481**	**7,423,410**	**9,411,222**	**11,040,696**	**10,921,194**	**10,956,259**
Net (Benefits – Costs)	**4,352,552**	**5,356,733**	**8,006,824**	**7,141,753**	**9,129,565**	**10,759,039**	**10,639,537**	**10,674,603**
Net present value (discounted)	**4,352,552**	**4,917,481**	**6,749,753**	**5,527,717**	**6,491,121**	**7,014,893**	**6,936,978**	**6,959,841**
Discount rate (8.90%)		**0.918**	**0.843**	**0.774**	**0.711**	**0.652**	**0.652**	**0.652**
Total Net Present Value	**48,950,339**							

The results of the calculation of costs and benefits of the informal pickers have verified the thesis that their actions produce more benefits than costs.

Regarding the results we obtained through the calculation of revenues of informal pickers, it can be concluded that if we compare them to their average earning obtained from our field survey, and if we aggregate them according to their numbers of about 3000 active informal pickers, we get similar numbers, which means that the combination we chose for calculating the revenues of informal pickers is credible to be used. Namely, informal pickers in Macedonia, on average, earn about 31,991 per year per waste picker only from packaging waste; the resulting differences are assumed to originate from the lack of realistic and much higher numbers regarding the exact metal quantity collected, the amount of e-waste collected (not included in calculations, earnings from batteries and accumulators (not included in calculations), as well as the earnings from bulky waste (not included in calculations) which is reused and resold at markets throughout the country.

The informal sector, in the existing work conditions, has saved, for the local authorities alone, about **1,045,033 Euros** per year. Savings are high since utilities do not have to collect, transport and dispose waste, which is a service they have already charged to the citizens. Savings are generated for transport, depending on the part of the process in which the material is collected from the informal pickers; therefore, when that is done directly from the combined waste containers, it can be stated that the costs of utilities are prevented from the earliest stage. Therefore, it is illogical that the collection of municipal waste from the waste containers of the public utility companies by the informal pickers is currently considered illegal, since the sooner they pick it, the less costs are generated for the formal pickers, which are currently the public utility companies. In addition, the cleaner the materials, the higher the values thereof. Waste picked by the informal pickers is often soiled and undesired for purchase.

Particularly important is the effect on the budget of the Republic of Macedonia, as well as on the GDP, of the increased waste export in the previous period, compared to 2009, taken as a baseline year. Nevertheless, this item should be carefully considered, taking account of the impossibility to exactly verify the percentage of this export attributed to the relevant waste fractions selected by the informal waste pickers, and what is the exact level which can be attributed to them.

However, if one takes into consideration the available data, it can be observed that earnings of the informal pickers are below the minimal guaranteed salary in Macedonia, and it is still selected as a better option for their earning compared to other alternative methods. It can be concluded from the results obtained that the role of revenues from the informal picking depend on an individual family basis. It is obvious that not all informal pickers deal only with waste picking throughout the year; therefore, it can be noted that about 30% of them also engage in other economic activities, such as, for example, seasonal alternatives in agriculture or industry. It is interesting to note that similar results were obtained in the German study on informal waste picking in the city of Cluj, in Romania (Gunsilius et. al, 2011).

3. Case Studies

- Sao Paulo and Belo Horizonte (Brazil)
- Pune (India)

The examples taken in our case studies do not include any Balkan examples, since latest results have indicated that there are no successful examples. Therefore, we decided to take slightly more remote examples, which are most successful in the world when speaking of formalisation of informal pickers and improvement of their actions.

The cooperative "Coopamare" is one of the first forms of organisation of informal waste pickers in Brazil. Their social exclusion was extremely high, since they were perceived as a potential threat due to the "dirty" work they engaged in relating to waste. Their work-related revenues were at a low level (Leubolt and Romao, 2015).

After they have joined, they managed to obtain financial support for procurement of equipment and space which improves the protection of their occupational health, they increased the collected and selected waste quantities, and have also started to process waste by themselves, thus securing higher prices. Their management is collective. All workers are given the same salary, based on the job hours performed in the cooperative. Decisions are made collectively on assemblies, which are held once a month. They have a management board consisting of a president, a financial manager, and an accounting committee so as to attend to the daily job responsibilities.

This model, proven as the most successful one, is the model of informal pickers in Belo Horizonte, which already has 8 cooperatives and a network of 400 partner organisations. The system functions in three manners: door-to-door waste collection, the second one is waste collection from specific green points with placed different bins for waste selection, and the third one includes utility companies which use their trucks to empty the bins for waste selection placed together with the bins for mixed municipal waste.

It is interesting to note that the selected waste collected is taken by the public utility companies to the centres of the cooperatives of waste pickers. Following its processing and sale, they fully retain the obtained funds. This is one of the methods by which local authorities support organised forms of waste pickers (Dias and Alves, 2008).

On the other side of the world, in the city of Pune in India, waste pickers have been functioning for more than 10 years through their cooperatives, and such organised method of actions has changed their lives. At the same time, reinforced state measures were undertaken for their support, protection of their dignity, and practicing of social justice.

They act as a registered, recognised and valid profession through which they exercise their special rights. They are registered as authorised persons of the city of Pune and carry identification cards and have secured health insurance (Gunsilius et al. 2011).

They collect, door-to-door, the selected waste by households, businesses and other entities, and have managed to double the quantities of collected and recycled waste, which in turn doubled their revenues. What is innovative is the introduction of the possibility of crediting so as to advance the infrastructure and work-related means of the cooperatives in order to further increase their work and initiate activities for repair and reuse of waste, with a view to additionally increase their income (WIEGO, 2012).

Formalisation of waste pickers in Macedonia

- Positions of stakeholders
    - Local authorities
    - National authorities
    - Business sector

Positions of the central government

The responsible persons in the Ministry of Environment and Physical Planning are aware of the huge problems in the domain of waste management in all its segments. In that respect, it is emphasised that a firm, and not only a declarative commitment, is required by all authorities and involved entities for improvement of the situation, and that a multi-sectoral approach is needed to deal with these problems. A particular issue that was indicated was the lack of a precise database which produces significant unknowns in the field of waste management, and that, at the same time, significant efforts are made to improve the database in terms of generated, collected, recycled and treated waste quantities. As regards informal waste pickers, there is awareness that they are a reality, and are not covered by the system, as well as that there is a lack of records and control of the packaging waste quantities that are collected and handed over, in particular regarding the PET packaging, metal, glass, paper, and cardboard. Furthermore, according to their assessments of the waste collected by the informal sector, it is emphasised that PET packaging is represented to a significant extent. However, it was indicated that informal pickers also collect electrical and electronic waste, in addition to packaging waste. They are aware that these pickers are not included in the waste management system, which poses an additional problem for collection and processing of waste data and for obtaining a complete insight in all waste management phases. In addition, they are aware that, according to their general assessments, informal pickers significantly contribute to waste recycling. The risk faced by the informal pickers is also emphasised, since besides the above-ground containers for mixed waste, they also collect waste from the underground containers and landfills, thus facing significant health risks. In order to improve and regulate the method of waste handling or collecting, amendments to several laws and bylaws are required.

The representatives of the Ministry of Labour and Social Policy believe that informal pickers could be included in the waste management system, and that this is a rather vulnerable category of citizens. Informal pickers are socially sensitive in every aspect, both in terms of low income, extremely poor living conditions, as well as in terms of the problems pertaining to the education of the children of these citizens. In addition, it is indicated that for the present moment, apart from the declarative

commitments in some of the strategic and planning documents, there are no more specific measures for this group of citizens, except through the social minimum welfare provided to them. Legislation is an additional problem, since it envisages such welfare to be denied if they generate other revenues, such as waste picking revenues. Therefore, according to them, it is necessary to first carefully identify all consequences and to then consider the legislative amendments.

Positions of the local government

Representatives of the local government, that is, of the City of Skopje, who were interviewed within the surveys of this project, mainly gave statements that they act in accordance with the legislation, and that legislative amendments are required to obtain more specific competences. They are not against informal waste pickers, and are aware of their contribution in the improvement of waste recycling and processing, as well as of their non-inclusion in the system. Their plans and programmes for waste management do not cover informal pickers; the inclusion thereof shall require legal amendments. In their opinion, until the primary selection and primary waste disposal is significantly developed, which is currently still far away, the informal sector will have a significant contribution in recycling and other forms of waste processing. In addition, it is indicated that local authorities only have partial and occasional cooperation with the informal sector, mainly through different pilot projects financed by foreign donors; however, following the completion of these pilot projects, such cooperation is discontinued. In order to improve this cooperation, in their opinion, significant financial means are required, as well as legislative amendments. Local authorities believe that they have no insight in the manner and quantities of waste collected by informal pickers, which disables the control of all flows of movement in all waste phases.

Positions of the business sector

The representatives of the business sector in the field of waste management indicate that significant investments are required in the field of waste management, as well as increased engagement of the inspection authorities in terms of control over the enforcement of the provisions of the Law on Packaging and Packaging Waste Management and the Law on Electrical and Electronic Waste Management. In addition, they believe that it is necessary to increase the private sector involvement in all waste management parts. They are not against informal pickers of municipal waste; however, they believe that the state should develop a system which would completely include them. They also indicate the poor public awareness of the citizens as a specific issue, as well as the low prices for services in the field of waste. They emphasise that informal pickers have their share in the selective waste collection and in the recycling of packaging waste. The business sector believes that, within waste management, in the part relating to waste collection, there is almost complete monopoly by the public local companies, and that stronger entry and increased openness of the local authorities

towards the private sector shall result in increased competitiveness and quality of waste management.

Potential costs and benefits in the formalisation of waste pickers

Results obtained from the previous calculation of current costs and benefits of the informal waste pickers in Macedonia allowed us to assume that in case of formalised conditions, the benefits would be increased. The calculations that we will make with regard to the potential costs and benefits for the formalisation of waste pickers shall be based on the assumption that the quantities collected and selected by them will be doubled, considering that all formalisation examples indicate at least double increase in their effectiveness. Formalisation estimates do not take into account children as contributors or, according to the field research conducted, we should deduct about 20% of the collected waste quantities.

In order to create a sustainable formalisation model, as a pre-requirement, we took the organisation through: cooperative, social enterprise or public-private partnership. Investments in capital and operational needs for formalisation are given after previous consultation with the business sector for waste management in Macedonia and they pertain to a period following the formalisation of informal pickers pursuant to their needs and our envisaged recommendations. The following was indicated under capital expenditures: procurement of equipment for recycling of up to 80 tonnes per year, which will produce granulate, procurement of new transport means, and construction activities for compliance with the standards. The calculated operating expenses for the organised activities of waste pickers were as follows: costs for producing granulate, operational licences, maintenance and use of work-related means and ongoing expenses for electricity and water. We believe it is necessary to start with a lower capacity so as to test the functioning of the entire system. The improvement of their machinery and work-related equipment shall enable waste pickers to commence collecting glass waste with the purpose of increasing the revenues.

Most of the costs and benefits mentioned in the previous calculation were used for calculation in the case of formalised conditions for a period of at least 12 years. The remaining costs and benefits that were included in the calculations are based on two-shift operations of 3000 informal pickers by using new 1500 tricycles. The calculation included the assumption that, in accordance with our opinions, the social welfare will not be cancelled in the first two years of the waste picker's registration; therefore, one of the benefits following the first two years for the state is reduction of the social welfare costs. However, we consider that, within a specific period until the situation is stabilised from the aspect of the social enterprise (or other forms of their association), health and pension insurance should be covered by the state, since the additional costs would be a huge burden for the organisation which will be responsible for the operations of the formalised waste pickers. In parallel, it is necessary that all waste pickers have health insurance; currently, only about 70% have that right.

Our aim was to develop a calculation of the opportunity cost when excluding children from the job process of waste collection, since the family community shall have less funds

because the children will stop working. As waste quantities that would be achieved in the case of formalised form of work, we took the quantities twice increased, since all experience worldwide indicates at least a double increase in the case of organised collection. The authors believe that the reuse centres which would ensure repair, creative rethinking of items and other forms of conversion, in accordance with the European practices, can secure a great number of highly-productive and well-paid job positions (RREUSE, 2015). However, this possibility was not indicated in this document, since we believe that in the first phase of their formalisation, they are far from acquiring and using skills for waste conversion.

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Costs												
Capital costs												
Investments in recycling equipment	499,508	-	-	-	-	-	-	-	-	-	-	-
Investment costs for transport means (tricycles, vans)	882,059	-	-	-	-	-	-	-	-	-	-	-
Investments in constructio n activities	99,089	-	-	-	-	-	-	-	-	-	-	-
Total capital costs	1,480,657	-	-	-	-	-	-	-	-	-	-	-
Operating expenses												
Operating expenses for maintenanc e of the work-related means	143,761	143,923	144,004	144,085	144,167	144,248	144,329	144,410	144,492	144,573	144,654	144,650
Operating expenses for production of granulate	48,342	48,342	48,342	48,342	48,342	48,342	48,342	48,342	48,342	48,342	48,342	48,342
Costs for a licence for storage, transport and	341	-	-	-	-	-	-	-	-	-	-	-

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Costs												
Capital costs												
processing of waste and for a licence to perform the activity and collect waste by the newly-established legal entity of the informal pickers												
Total operating expenses	192,325	192,146	192,227	192,308	192,390	192471	192,552	192,633	192,714	192,795	192,877	192,958
Direct costs for the state												
Health insurance costs of informal waste pickers	131,334	131,334	131,334	131,334	131,334	131,334	131,334	131,334	131,334	131,334	131,334	131,334
Costs for pension insurance	43,362	43,362	43,362	43,362	43,362	43,362	43,362	43,362	43,362	43,362	43,362	43,362
Social welfare costs of informal waste pickers	8,361	8,361	-	-	-	-	-	-	-	-	-	-
Total direct costs for the state	183,058	183,058	174,697	174,697	174,697	174,697	174,697	174,697	174,697	174,697	174,697	174,697
Indirect costs for the informal pickers												

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Costs												
Capital costs												
Exclusion of children from the work	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607
Total indirect costs for the informal pickers	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607	623,607
Total direct and indirect costs	2,478,225	998,310	990,035	1,022,455	1,022,536	1,022,617	1,022,698	1,022,780	1,022,861	1,022,942	1,023,023	1,023,104
Direct benefits												
Income of the informal pickers	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431	2,494,431
Income of the state on the basis of personal income tax	282,964	282,964	282,964	282,964	282,964	282,964	282,964	282,964	282,964	282,964	282,964	282,964
Income from the sale of granulate	77,972	77,972	77,972	77,972	77,972	77,972	77,972	77,972	77,972	77,972	77,972	77,972
Reduced social welfare costs for the state relative to the informal	-	-	8,361	8,361	8,361	8,361	8,361	8,361	8,361	8,361	8,361	8,361

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Costs												
Capital costs												
waste pickers												
Fees for a licence for treatment and storage of electrical waste, waste batteries and accumulators and municipal waste (metal, paper, glass, rubber etc.)	6,315	6,374	6,725	6,783	6,842	6,900	6,959	7,017	7,075	7,134	7,192	7,251
Fees for licences for transport of non-hazardous waste	5,263	5,328	5,393	5,458	5,523	5,588	5,652	5,717	5,458	5,523	5,588	5,652
New private-sector employments (through costs for employees through financial reports of CRM – packaging	291,611	298,759	305,906	313,054	320,201	327,349	334,171	341,643	348,791	355,938	363,086	370,233

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Costs												
Capital costs												
waste handlers)												
New private-sector employments (through costs for employees through financial reports of CRM – electronic waste handlers and handlers of waste batteries and accumulators)	20,023	20,380	20,641	21,030	21,683	22,008	22,332	22,657	23,307	23,632	23,957	24,282
Total direct benefits	3,176,603	3,184,227	3,200,402	3,208,058	3,215,976	3,223,567	3,230,834	3,238,749	3,246,340	3,253,931	3,261,522	3,269,114
Indirect benefits												
Waste export according to tariffs of customs classification (paper, glass, plastic and waste	16,353,133	16,678,017	17,002,901	17,327,785	17,652,669	17,977,552	18,302,436	18,627,320	18,952,204	19,277,088	19,601,971	19,926,855

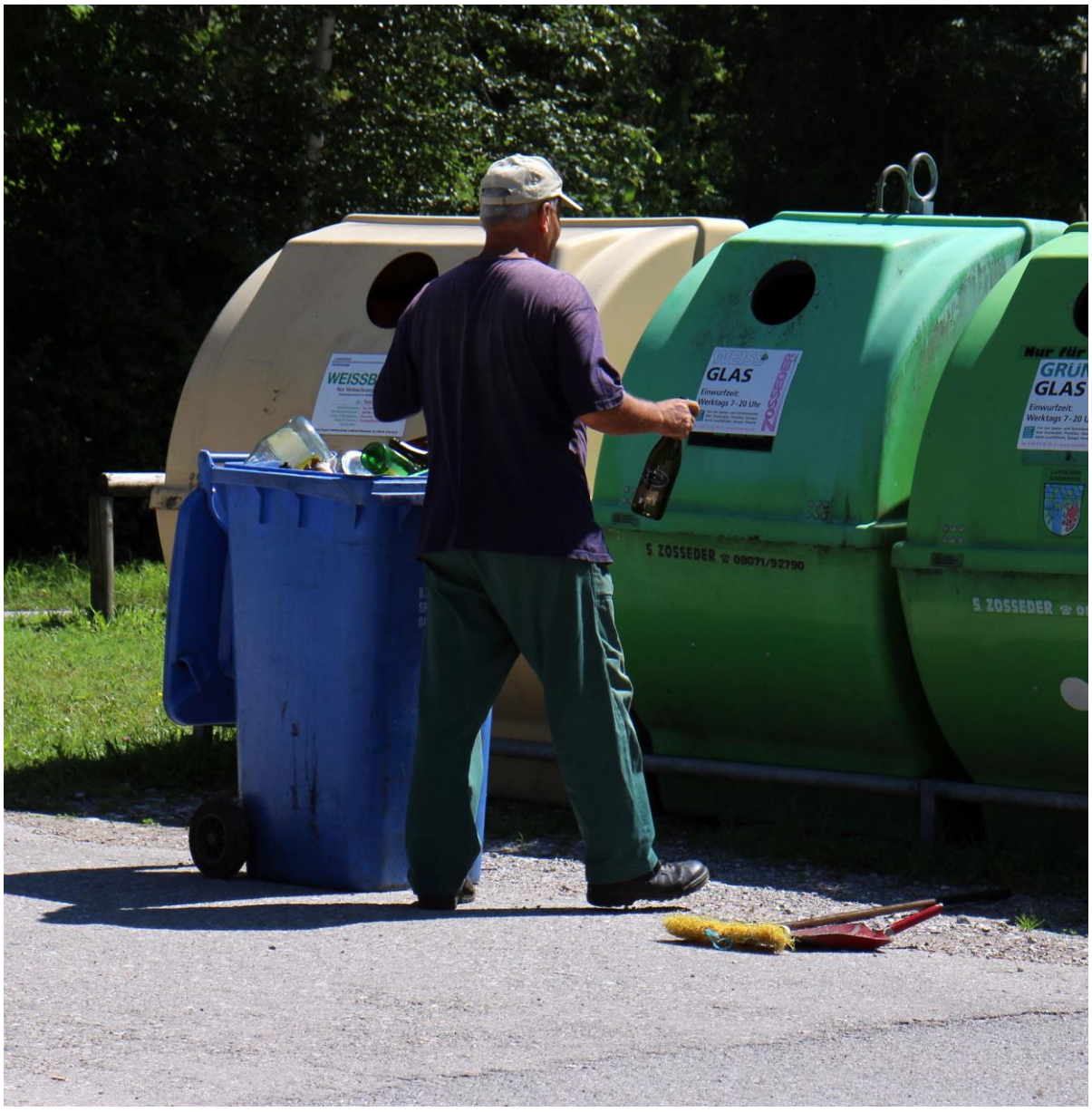
Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Costs												
Capital costs												
batteries and accumulators)												
Potential revenues from collection of glass from packaging waste to be sold for recycling purposes	469,908	469,908	469,908	469,908	469,908	469,908	469,908	469,908	469,908	469,908	469,908	469,908
Cost reduction for utilities for waste collection and transport, which is collected on their behalf by the informal pickers without any compensation	1,765,330	1,797,818	1,830,307	1,862,795	1,895,284	1,927,772	1,960,260	1,992,749	2,025,237	2,057,725	2,090,214	2,122,702
Total indirect benefits	18,576,804	18,933,954	19,291,104	19,648,254	20,005,403	20,362,553	20,719,703	21,076,853	21,434,002	21,791,152	22,148,302	22,505,452
Total benefits	**21,753,408**	**22,118,182**	**22,491,506**	**22,856,312**	**23,221,380**	**23,586,121**	**23,950,537**	**24,315,602**	**24,680,343**	**25,045,084**	**25,409,825**	**25,774,566**

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Costs												
Capital costs												
Net (Benefits – Costs)	**19,275,183**	**21,119,871**	**21,501,470**	**21,833,856**	**22,198,843**	**22,563,503**	**22,927,838**	**23,292,822**	**23,657,482**	**24,022,142**	**24,386,801**	**24,751,461**
Net present value (discounted)	**17,694,618**	**17,804,051**	**16,642,138**	**15,523,872**	**14,473,646**	**13,515,538**	**12,610,311**	**11,762,875**	**10,977,071**	**10,233,432**	**9,535,239**	**8,885,774**
Discount rate (8.90%)	**0.918**	**0.843**	**0.774**	**0.711**	**0.652**	**0.599**	**0.55**	**0.505**	**0.464**	**0.426**	**0.391**	**0.359**

Total Net Present Value (12 years)	**159,658,570**

It can be observed that initial investments and enabling of conditions could result in increased revenues of the waste pickers, on average, some 51186 denars per picker annually. Taking into account the lack of more realistic data on the metal, e-waste, bulky waste, and other types of waste, it can be concluded that potential formalisation could enable 3000 informal pickers to reach the current non-subsidised Macedonian minimum salary.

The results obtained also indicate that even in case of excluding children from the work, which leads to a reduction of 20% of the waste quantities collected which are current contribution of the children, the collected waste quantities will still be significantly increased compared to the pre-formalisation quantities, which means that formalisation would allow children to not have to contribute to the waste collection and attend school classes.



Conclusions and recommendations

The research has shown that informal waste pickers in Macedonia are more active and more effective in the activities for processing and usage of waste as resource in the existing conditions of action compared to the formal sector. Their waste valorisation activities are performed at lower costs compared to the formal sector, since being left to their own devices has thought them, through practical experience, how to valorise waste, even the waste whose value is potentially not well known. It is clear that they have high level of specific knowledge for identification of valuable materials and for the use thereof. Moreover, the work of the informal pickers uses rather low or no quantities of fossil fuels. This is a result of their use of own or animal powers, against the use of motorised transport. Therefore, they generate rather low greenhouse gases and contribute to the prevention of high quantities of potential greenhouse gases from the landfills.

Informal pickers create social benefits, both direct and indirect, through their activities. If they lacked the current revenues from waste collection and selection, this marginalised group of low-qualified labour force would have to be provided with additional financial assistance or would have been involved in other illegal activities. Formalisation and integration of informal pickers would result in increased quantities of selected waste ready to be processed, which would generate savings for the public utility companies and the citizens, would extend the life-cycle of landfills and provide for environmental protection.

The development of policies and measures to improve the quality of life of the informal waste pickers, in accordance with the results of the cost-benefit analysis, and of the remaining part of the society, has to be carried out systematically. Therefore, the profession first has to be recognised so that they could be registered. This shall enable, on the basis of records, the development and implementation of support policies for this marginalised group of citizens and the ascertaining of their rights by the state. Results have shown that this is a group of about 5000 citizens on an annual level, who engage in this activity; however, on average, this involves 3000 citizens on a daily basis. When seasonal work earnings are better, some of them discontinue the waste collection activities, although most of them continuously engage only in this type of activity. The organising of informal pickers, could improve their potential negotiating position with the industry sector, mainly with the relevant institutions, and they could also improve their poor social and economic position by reducing poverty through the development of their activities in the field of waste. Through the various organisation forms, they would be able to conclude contracts with companies of the industry and apply to receive grants from national and foreign donors. One of the main advantages of their formalisation and organisation, is the possibility to conclude contracts with the local authorities. The relocation of their activities outside of the landfills and other places for waste disposal shall significantly reduce the risks for their health caused by the high-risk working

conditions. Their association and organisation would secure them stability, improved revenues and improved work and living conditions through legalisation of their activities. The organisation of informal waste pickers in a legal entity, by following the best practices from other countries, could result in increased economic and environmental benefits. Specifically, we would like to emphasise the environmental benefits. Local and national authorities, as well as the whole society, would have significant environmental benefits if in addition to collection and selection of some of the municipal waste, informal pickers are also provided with financial and other material support to select the organic part of the waste so that it could be composted or otherwise processed and for reuse of bulky, construction and other types of waste through the opening of reuse centres.

Furthermore, their organisation is possible in three potential models for organisation of waste pickers: social enterprise (civil society organisation or company), cooperative and public-private partnership. Considering the low education level and the knowledge of the social flows, their organisation in the initial phase shall have to be organised through an external factor.

- Recognising and registration of waste pickers as profession
- Securing of social benefits for the waste pickers
    - Transitional period with the right to a two-year use of social welfare, besides their additional legal revenues from waste collection
    - Obligatory health insurance
    - Obligatory social insurance
    - Scholarships for education of the children of informal waste pickers
- State support for formalisation of waste pickers
    - Provision of land for temporary use purposes
    - Financing of the main assets for work of the capacity
- Utilisation of the possibilities for recycling of: organic waste, rubber, textile, glass, collection of e-waste and other types of recycling waste
- Opening of centres for recycling and other forms of waste processing with previous training of the informal pickers for acquiring of skills, such as: processing of furniture, processing of metal, PET packaging, glass, and other types of waste (opening of a state programme for support of informal pickers)
- Adoption of local and national plans and other documents for waste management which envisage the work of waste pickers
- Revocation of the penalties for waste pickers who will register as individuals performing an activity
- Recording and issuing of documents for the informal pickers

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Policy study 12:

Informal sector inclusion in the sustainable waste management system as an opportunity for employment and social inclusion of vulnerable groups