# THE CONTRIBUTION OF HOUSEHOLDS IN IMPLEMENTING CIRCULAR ECONOMY: CASE OF NORTH MACEDONIA

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## ABSTRACT

Taking into consideration the rising level of waste, and the improper management of the scarce resources in the economy, there is a need for a system that will maximize the usage of these resources and minimize waste. The so-called circular economy tends to repair, reuse, recycle and repurpose products to achieve economic development and to increase the efficiency of products used.

North Macedonia is actively involved in the process of implementing a circular economy, so that using resources will be as efficient as possible. Although several initiatives and programs are being used nationally, it is considered that the most important contribution comes from the smallest units such as the consumers and households, therefore a large contribution is expected through small daily choices of consumers to achieve the best results. There is also a gap in literature regarding the behavior of households for implementing circular economy.

Considering that the purchasing decisions, the lifespan of the usage of products and their transfer into wasted resources come primarily from households, this paper focuses on gathering information from a questionnaire delivered to households located in North Macedonia to give a conclusion on how informed they are and what is their contribution for moving towards a circular economy.

According to the results there are still changes necessary to be made in the daily practices of households, mostly in the possibility of using solar panels, and the practice of purchasing second-hand clothing and appliances to reduce waste. Therefore, this paper gives contribution to a more comprehensive approach to circular economy and to serve as a way of informing households and policymakers regarding the focus points that need to be addressed more to achieve the implementation of circular economy and the benefits that come with it.

## KEYWORDS

Circular economy, households practices, efficiency of resources, recycling, biodegradable

## JEL CLASSIFICATION CODES

R20, Q53

## 1. INTRODUCTION

To extend the life-cycle of products, circular economy is a production model that includes practices when products and materials are shared, reused, repaired, and recycled.

The European Commission's initiative to transfer into Circular economy model supposes that this model is highly affected by daily choices made from consumers. Traditionally, households in some developing countries take out their waste materials mostly in nature. Unfortunately, it is not taken into consideration that these practices may lead to undesirable effects such as health damage and harmful odors. Governments, policymakers, and individuals are continuously trying to find new ways to improve ways for waste disposal, storage, and

recycling.

Having into consideration that North Macedonia is a candidate country for entering in EU, it is a necessary step to include all European requirements and common practices, and at the same time to follow the EU legislation regarding ways to manage waste, as an initial target when moving from linear to circular economy. As such, initiatives need to be broken down from legislation and policies to small daily changes in society.

In theory, households are defined as the smallest social units, where citizens take part in using resources of nature to cover their basic needs of feeding, clothing, and basic household needs heating, and as a result, a large amount of waste is produced. As such, it is considered that households can also help reduce waste by making some simple changes in their lifestyle. The biggest effect of households can be seen firstly in the choices that they make every day for purchasing, the amount of money and materials that are spent for these purchases and as a result the amount of waste that comes with it. It is considered that they can also reduce solid waste by recycling, repairing rather than replacing durable goods, buying products with minimal packaging, and choosing packaging made from recycled materials (Environmental encyclopedia, 2023)

This paper aims to analyze the behavior of households and their daily practices towards circular economy. From purchasing secondhand clothing, to repairing and making efforts to lengthen the life of already-in-use appliances and furniture, households can benefit and simplify the road towards circular economy.

The paper aims to answer the following Research questions:

- What are some practices used until now in North Macedonia?
- What is the contribution of households in North Macedonia for implementing Circular economy?

## 2. LITERATURE REVIEW

The model of circular economy is a system aiming that materials never become waste and nature is continuously regenerated. Products and materials are not declared as waste after a single use, instead they are maintained, reused, remanufactured, recycled.

The core of circular economy is to eliminate the so-called waste, by designing products to last longer and the possibility to be transformed and reused in a shorter process.

Linear and circular economy have differences in terms of using sources in a circular way, which means the goal of circular economy is to have products as long as possible flowing in different ways, while linear economy goes from using resources to production and ends in waste.

According to the United Nations Environment Programme (UNEP, 2021) circular economy is the ultimate way to achieve the Sustainable Development goals, which means that sustainable consumption includes several dimensions in its model including collective, systemic and an individual dimension.

It is expected that by making changes towards a circular economy, there will be available products which are of higher quality, have better functionality and safety, products which are more efficient and affordable, are expected to last longer and most importantly are designed in such a way that there is a possibility for reusing, repairing, and recycling (Metrostor, 2023).

Some circular solutions find their way back from “Indigenous Peoples” as they have been implementing circular solutions as a way of living. They have been achieving this by using agricultural practices through which it is ensured that natural systems are regenerated, also by building houses and structures using materials that are regenerative (bamboo or adobe bricks).

Ripple (2017) stated that humans are not being cautious about the extensive consumption of resources, and this is continuously damaging the biosphere. To decrease this damage, we should start keeping track of individual consumer behaviors.

Nowadays transitions towards circular economy is a possibility to decrease the continuous degradation of nature, to shape and rebuild natural prosperity and to ensure regenerated health of our ecosystems.

Wheeler and Glucksmann (2015) in their research suggest that consumers have a vital role in moving towards a circular economy. According to their research they claimed that by sorting their waste for recycling, consumers aid in the waste management process, by carrying these tasks they speed up and ease the process of recycling and as a result they aid in an easier sustainable consumption.

According to European environment agency (2019) it is concluded that, nowadays resources are being used

at a 50% higher rate than it would possibly have the chance for a replacement.

In a report by OECD (2019) it is mentioned that circular economy presents a way to encourage better efficiency of resources, more sustainable consumption, and patterns of production, in cities of different sizes, including at the neighborhood level.

According to European Environment Agency's reports (2016) by implementing circular economy in different cities and regions the environment conditions will also be improved as pollution is expected to decrease and shares in renewable energy will improve, meanwhile raw material consumption along with consumption of water, land and energy will be reduced leading to a more resilient and higher chances of jobs opportunities and economic growth.

## 3. RESEARCH METHODOLOGY AND DATA

To analyze the situation of circular economy in the republic of North Macedonia in this paper analysis of existing literature is used, combined with some practices and initiatives undertaken to transform from the traditional linear economy to circular economy and a primary data is collected through distribution of a questionnaire with 15 questions among 85 households in North Macedonia. The primary data is analyzed by utilizing descriptive statistics.

The main objective of this paper is to gather information on how familiar households and consumers in North Macedonia are about the Circular economy, how often do they implement practices that contribute towards efficient usage of scarce resources in the economy, the possibility of repairing, recycling along with protecting the environment and as result to minimize expenses and reduce waste.

### 3.1. Initiatives taken in North Macedonia towards transitioning to circular economy

In North Macedonia there are several initiatives taken towards circular economy. The Law on environment (2005) introduced additional taxes for the import of used motor vehicles, including also used different electrical and electronic equipment and products, dangerous waste, and harmful substances. The idea was that there would be a decrease in producing and importing of products that have a negative environmental impact or could damage human health and misuse natural resources.

In 2008 the regulation for reduction of the emission of greenhouse gas was implemented, which aim was to introduce rules and steps on how to perform the acceptance of waste at landfills in every class and the use of appropriate measures for accumulation and gas emissions control. From 2009 to 2011 the rulebook on quantity of biodegradable waste was introduced while during the period from 2009 to 2012 the instrument for reusing, energy processing and recycling of packaging waste was introduced. Also, from 2010 the instrument for Reducing waste of batteries and accumulators was introduced, for the purpose of achieving higher levels of recycled quantities.

The efforts and policies introduced on the national level resulted in the introduction of Reverse Vending Machines. These machines started as an action to control and to reduce waste as selective waste disposal, collecting and recycling products and materials. With the aim of motivating citizens to practice the process of selective this type of waste disposal is crucial and extremely important in the overall process for maintaining a clean environment.

Another initiative, that started from 2020, North Macedonia should reduce the procurement of plastic products and single-use packaging. This means that the ministries and other institutions will replace items in plastic bottles with items in glass ones, plastic cups, straws, and other single-use plastic goods will no longer be used. As the newest initiative taken, is considered the life projects in 2023 which supports organizations that are part from both public and private sector engaged in projects on environment and climate action, especially areas that include cases such as pursuing energy efficiency, ideas to clean polluted areas, the improvement of the managing water resources, to improve the protection of biodiversity in conformity with a circular and net-zero emission economy.

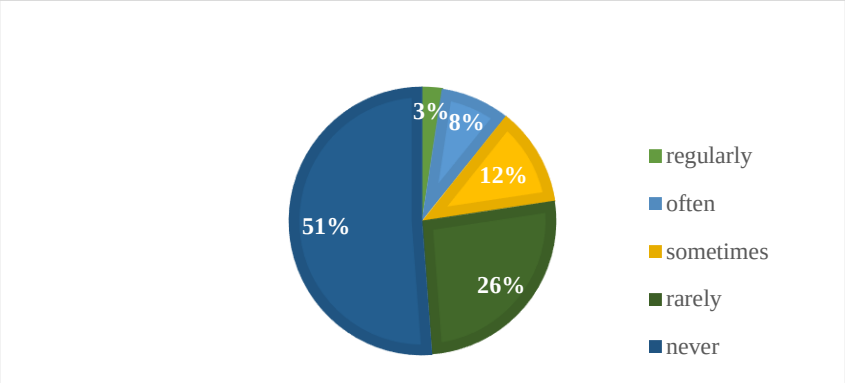
The project overall aims on developing and demonstrating techniques that are eco-innovative, also it will promote the best practices and behavioral changes. That supports the creation, surveillance and enforcing of laws in accordance with laws like the EU ones. By analyzing the 2020-2023 activities in the Life project the

activities planned are to improve household waste management in Republic of North Macedonia, especially to establish new regional waste management centers.

## 4. RESULTS AND DISCUSSION

This research paper utilizes primary data from a distributed questionnaire that was delivered to 85 households located in North Macedonia. The questionnaire comprised of questions addressing the behavior of households in North Macedonia related to circular economy. The first question addressed to respondents aims to find out how often households purchase secondhand products, materials, and furniture, as this is the simplest and smallest form of implementing circular economy and avoiding additional waste**.**

Figure 2. How often do you buy secondhand products (clothing, household appliances, furniture)?

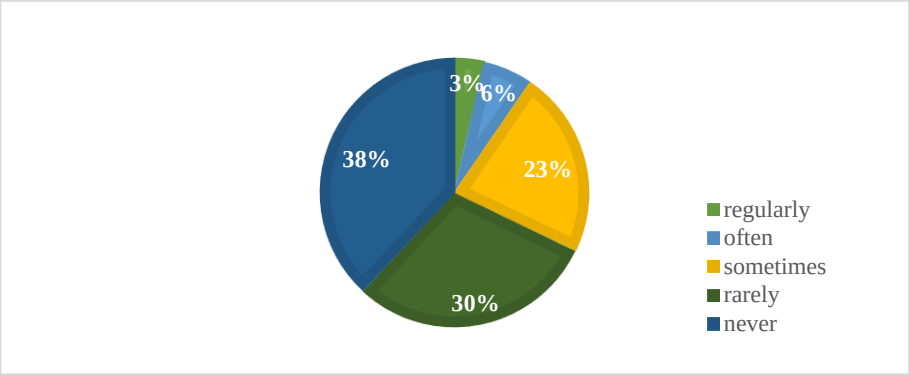



Source: Own research data

The results show that there are still changes to be made in terms of shopping habits to be able to support circular economy, as 51% of respondents never have the habit of purchasing secondhand products,26% rarely apply this form of shopping,12 % sometimes, and 8 % responded with often, leaving only around 2 % of respondents that regularly try to purchase secondhand products.

Regarding the borrowing of home appliances or others as a way to reduce unnecessary expenses, and to reduce waste as a result of new purchasing and additional resources being used, respondents (see Figure 2) show little interest for this practice as 38 % of them answered that they never do borrow, 30% answered rarely, only 22% of respondents answered that sometimes they consider borrowing instead of purchasing their own home appliances to avoid expenses and waste, while 6 % often practices this and only 4 % regularly borrow home appliances.

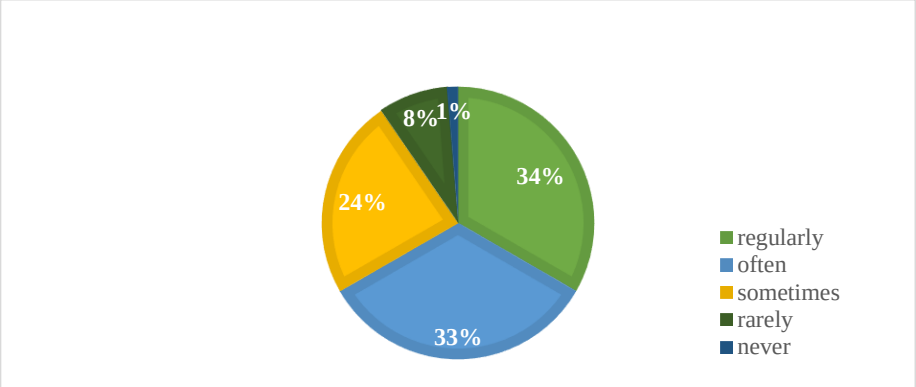
Figure 3. How often do you borrow/share products such as home appliances, other machinery to avoid additional waste?




Source: Own research data

When it comes to purchasing new home appliances respondents seem to have more knowledge about the benefits that come together with new models that have features that help in minimizing waste, reduce water waste and reduce wasting energy.33% of respondents regularly focus on purchasing models with better features, 33% of respondents often practice it, 24% of respondents sometimes consider new models while only 8% rarely take into consideration purchasing new models with energy and water waste reducing features.

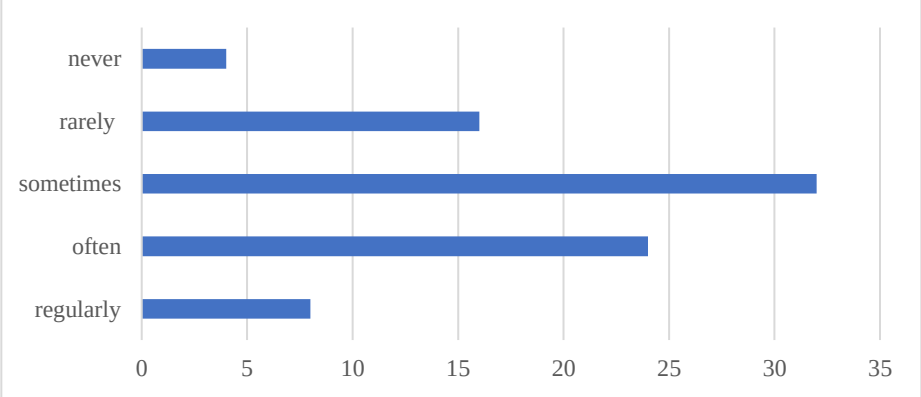
Figure 4. When purchasing home appliances how often do you focus on environmentally friendly models that focus on (reduced water waste, reduced energy waste)?




Source: Own research data

In terms of purchasing products which have the sign recycled or biodegradable respondents have the tendency to purchase them only in some cases 38% or respondents answered that they consider it but not regularly 28 % of respondents often purchase these types of products while only 9.5 % regularly purchase recycled/biodegradable products and 5 % never consider purchasing them.

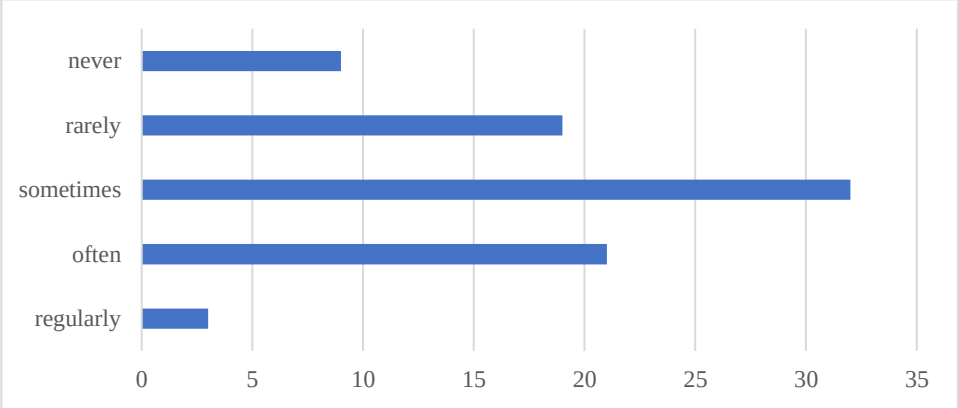
Figure 5. How often do you try to purchase products that have the recycled/biodegradable icon on them?




Source: Own research data

As a toxic material that takes a large part in polluting the air and environment, also adding up in waste which takes more time and resources to be recycled and to be reused, this questionnaire also included asking respondents if they avoid purchasing plastic materials. Only 8% of respondents regularly try to avoid purchasing products from plastic, around 24% of respondents often avoid them, most of our respondents around 32% sometimes take into consideration not purchasing them while 16% and 4%, rarely and never consider avoiding products from plastic materials.

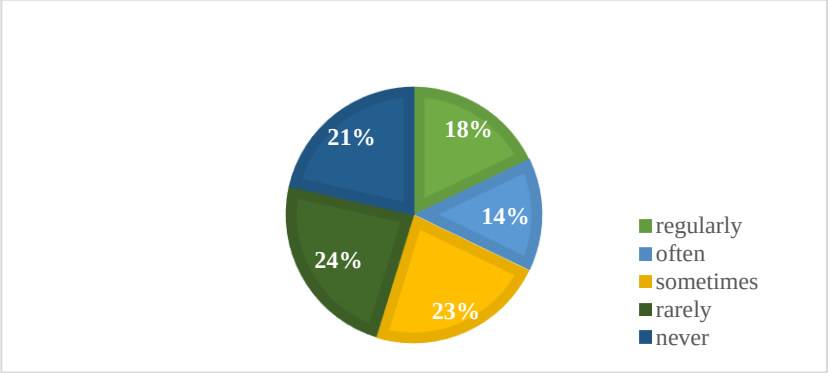
Figure 6. How often do you try to avoid purchasing plastic materials?




Source: Own research data

In terms of transport there is similarity in results, as 18% of respondents always try to use other means of transport instead of a car for their daily activities. The purpose of this question was to gather information whether households take into consideration using their bicycle or public transportation instead of their car so that they can contribute to protecting the environment, reducing waste, and reducing air pollution. As shown in Figure 6, 21% of respondents claimed that they never change their means of transport, 14% of respondents often practice this, 22% sometimes, while also 24% rarely practice changing their means of transport.

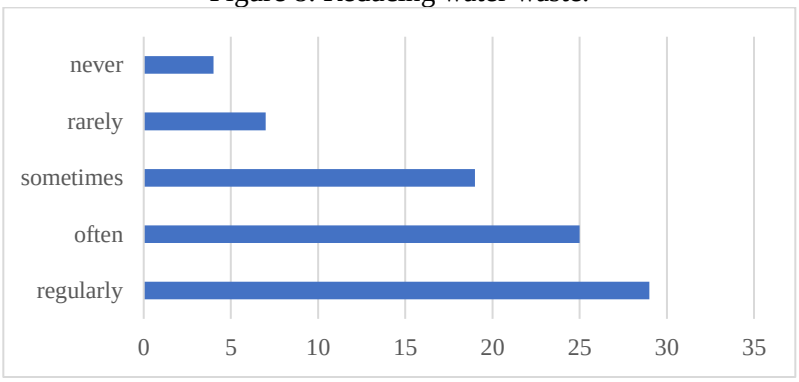
Figure 7. Using a bicycle or other means of transport instead of a car for daily activities?




Source: Own research data

Efficient water usage is also part of the questionnaire as it is of great significance that water is used efficiently, and households have a direct impact on this. 34 % of respondents have claimed that they regularly try to use water without wasting it, 30 % also claimed that they often do this practice, 22% of respondents sometimes focus on reducing water waste. Only 5 percent of respondents claimed that they never focus on reducing water waste and 8% rarely practice it.

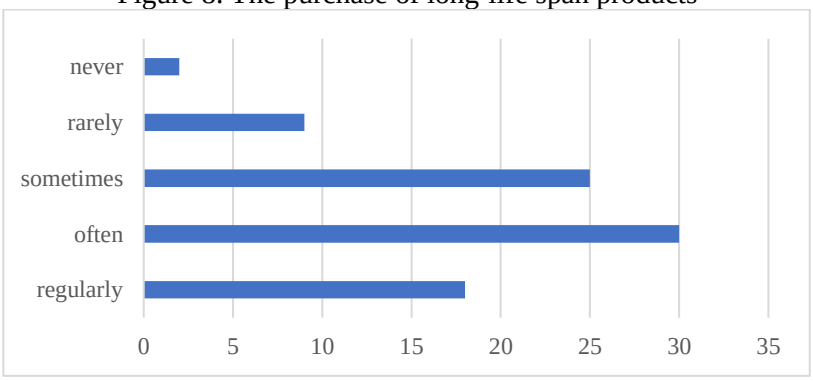
Figure 8. Reducing water waste.




Source: Own research data

Another segment that has a huge impact on increasing waste are single use products, as firstly they take more raw materials and expenses to be produced, some parts from are commonly not prone for recycling, they take more time to be decomposed in nature and as a result add to waste increase.

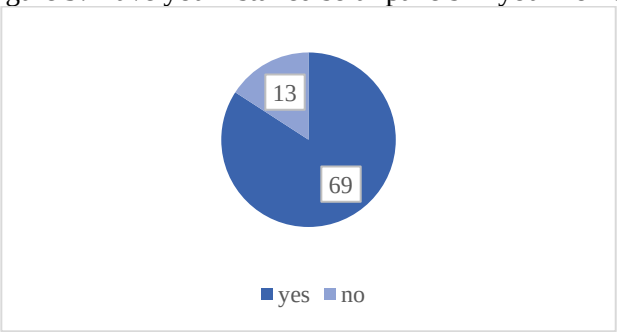
Figure 8. The purchase of long-life span products




Source: Own research data

The results from our respondents have given positive results regarding the practice of purchasing long life span products instead of single use. Around 21 % regularly practice it, 36% of respondents often focus on buying long life products while only 2 % never practice this, and 11 % have responded rarely.

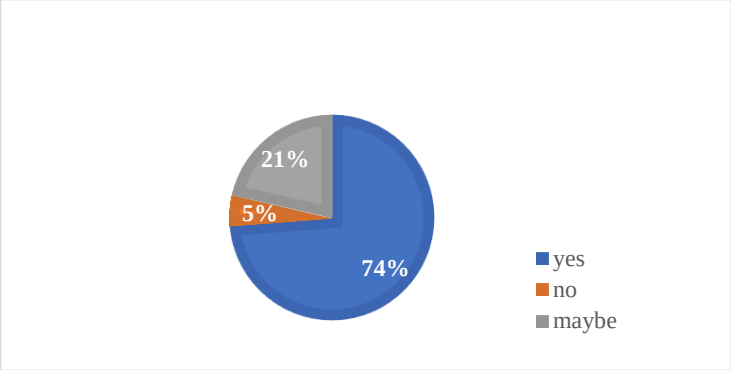
Figure 9. Have you installed solar panels in your home?




Source: Own research data

As a way using energy efficiently and finding new ways to produce energy, this paper aimed to gather information about the usage of solar panels in households in North Macedonia. Unfortunately, only 16% of respondents have them installed in their households, while 84% do not use solar energy in their homes.

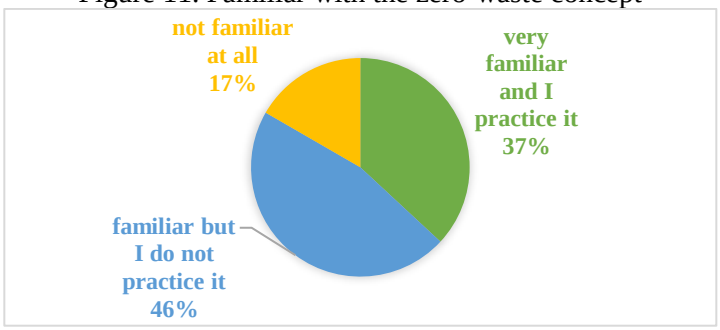
Figure 10. The possibility of moving to electric cars as a way of reducing air pollution.




Source: Own research data

In the last part of the questionnaire, it was taken into consideration the possibility of moving to electric cars as a way of reducing air pollution, saving energy, and maximizing the efficiency of materials for production. The respondents from North Macedonia have claimed that if the conditions were met, they would certainly make this change in their everyday life. As such 74% of respondents were positive about this change while only 21% would still refuse to make a change.

Figure 11. Familiar with the zero-waste concept




Source: Own research data.

The aim of this paper was to gather information regarding the usage of the zero concepts in households located in North Macedonia. As a new concept of waste management, the zero-waste concept is used by households and consumers to support the environment and as a result to minimize waste. In developing countries there is still not a wide usage of this practice, as some segments of the population are not even familiar at all with the concept. Regarding situation in our country, around 46% of respondents have claimed that they are not familiar at all with this concept, 37% of respondents claimed that they are familiar with the concept, but they do not practice it, while only 17 % of respondents claim that they know, and they try to implement this concept in their everyday life.

## 5. CONCLUSION

North Macedonia has implemented several changes in legislation to support the easier transition towards circular economy. Aiming to improve the efficiency of using resources, changes have been applied starting from supporting public and private organizations through several projects, to smaller initiatives that can influence and improve the behavior of citizens. Reduced water waste, recycling and avoiding single use products and plastic that can negatively impact the environment and increase pollution are some choices that citizens can daily make, but will greatly contribute to better society. Having in mind how important are these small changes in behavior and taking into consideration the lack of research for this topic, this paper analyzed how often

households implement practices that support circular economy.

According to the results there are still changes necessary to be made in the daily practices of households, as from our sample most households do not use solar panels, they don't consider as much purchasing secondhand clothing and appliances to reduce waste and have limited knowledge regarding the zero-waste concept.

Although, positive results are in the aspects of reducing water and energy waste and air pollution, as households practice purchasing energy/water saving models of home appliances and would switch to different ways of transport to reduce air pollution.

North Macedonia has shown positive changes towards circular economy in terms of policymaking, yet there are still changes to be made in household level. It is expected that the ongoing projects that have in line changes towards circular economy will benefit the country as well, it will have positive impact towards informing and sharing awareness to communities for the benefits of recycling, reducing waste and focusing on efficiency in daily practices and household choices. There is also a recommendation for further research of this topic, as a larger number of households can be used, and more data can be gathered, aiming for a better view of how informed and how prepared citizens are to make changes towards a circular economy.

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