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THE REALITY OF THE CIRCULAR ECONOMY IN ALGERIA AND ITS CONTRIBUTION TO SUSTAINABLE DEVELOPMENT

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Abstract:
In this research paper, we will try to shed light on the circular economy and its contribution to sustainable development, as well as show the efforts of the Algerian state in achieving sustainable development. By adopting mechanisms and strategies towards activating and embodying the pillars and foundations of the circular economy which still needs to be developed in the future.
Keywords: circular economy, sustainable development, recycling, waste.
JEL Classification Codes: Q56, Q53, Q13

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1. INTRODUCTION

The world has recently seen many solutions to address environmental challenges, one such solution is a circular policy or circular economy, which has taken a lot of interest. It's aimed at balancing economic development with environmental and resource protection. This policy is based on efficient use and recycling of resources by Using sophisticated means to protect the environment. This circular economy is characterized by low consumption of resources and energy and also low emission of pollutants and wastes. The circular economy requires cleaner means of production and also integrated planning based on the optimal use of resources in order to contribute to achieving sustainable development in all fields.

Algeria, like other countries of the world in general, and the Arab world in particular, is seeking a radical change in the economic structure in order to achieve the dream of future generations, which is to see a truly diverse and sustainable economy. In view of the current economy, which is known as the linear economy, which contributes significantly and directly to the depletion of natural resources, This leads to environmental imbalances and therefore to the emergence of many environmental problems that threaten the lives of many organisms, including humans in the long-term. In order to avoid further deterioration, Algeria has adopted a new economic model based on a new approach to ensure balance and transforming the structure of the national economy into one of its most important objectives is to support sustainability. So today the circular economy is considered as a strategic option to get out of this situation and deal with imbalances. Algeria now has the opportunity to move towards this option in order to improve its economy and contribute to sustainable development. Therefore, we present the following problematic: How interested is Algeria in the circular economy to contribute to sustainable development?

2. Sustainable development

2.1Definition of sustainable development

•According to the United Nations Development and Environment Program: Sustainable development is a development that allows to meet the needs and requirements of the present generations Without prejudice to the ability of future generations to meet their needs. (Beitone, 2001, p. 27)

- Definition of the World Business Council: The contribution of business

enterprises to achieving economic development, and improving living conditions for workers and their families, as well as the local community and society as all. (Bodi & Bin Sufyan , 2012, p. 3)

- The concept of sustainable development in the Algerian legislation is: It was mentioned in Article 4 of Chapter 1 of Law 3-10 of July 19, 2003, Relating to environmental protection within the framework of sustainable development: It means reconciling a viable social and economic development and protecting the environment, so the inclusion of the environmental dimension in a development framework that ensures meeting the needs of present and future generations. (Rizek Al-Makhadami, p. 117)

2.2 Dimensions of sustainable development

Sustainable development is not based only on environmental development, but includes social and economic development. It is a development of three dimensions that are interdependent and complementary:

- **Environmental dimensions**

The environmental dimensions include the following: (Boumaaraf & Amari , 2010, p. 28)

- ✓ Protecting the natural resources needed to produce food;
- ✓ Expansion of production to meet the growing needs of the population;
- ✓ Protecting the natural resources on which agriculture depends;
- ✓ Not to overuse of fertilizers and pesticides that pollute groundwater and soil;
- ✓ Reducing human and animal pressures that damage vegetation and forests;
- ✓ Good use of arable land and water suitable for irrigation.

- **Social dimensions**

include the following: (Qassem Mohareb, 2011, p. 195)

- ✓ Relationships of individuals and human groups of all kinds;
- ✓ Institutions, systems, and values that govern interactions with others;
- ✓ Beliefs, religions, constitutions, laws, and ongoing political transfers;
- ✓ The essence of the social dimension of sustainable development is equitable distribution of resources and Social equality;
- ✓ Ensuring community participation in making development decisions and ensuring that the principles of good governance are followed to ensure human freedom and security.

- **Economic dimensions**

include the following: (Allam, 206, pp. 96-97)

- ✓ Stop wasting resources;
- ✓ Raise the efficiency of the economy and reduce the dependency of developing countries;
- ✓ Equal distribution of resources and limiting inequality of income;
- ✓ Reducing military spending.

2.3 Characteristics of sustainable development

These characteristics are as follows: (Abu Tahoun, 2003, p. 150)

- ✓ It is a long-term development and this is one of its most important advantages, It takes the temporal dimension as its basis. It is development based on the future of generations;
- ✓ Taking care of the equality and the rights of future generations;
- ✓ It is a multi-dimensional and interdependent process based on planning and coordinating economic development plans and social on the one hand, and environmental development on the other hand;
- ✓ It is characterized by overlapping and complexity, especially with related to the natural and social in development;
- ✓ It seeks to achieve the requirements of the poorest segments of society and reduce poverty rates at the global level;
- ✓ It tries to develop and develop the spiritual and cultural aspects and preserve the civilizational peculiarities of each society.

3. The circular economy

3.1 Definition of circular economy

The circular economy is the economy that does not produce waste at all except in very few quantities and in the narrowest limits, and It does not have any negative effects on the environment. It's based on high-quality recycling of ingredients and products. Major goods and products are repairable and renewable, from the beginning of their design to ensure that they are used many times. Thus ensuring the optimal and effective use of available resources for achieving sustainable development. (Gehish & Abed, 2020, pp. 138-139)

3.2 Features of a circular economy

There are five features of a circular economy: (Al-Rumaidi, 2018, p. 343)

- ✓ waste design;
- ✓ Enhance the ability to adapt through diversity in operations and activities;
- ✓ The trend towards renewable energy sources;
- ✓ Thinking about ecosystems;
- ✓ Thinking about road devices.

3.3 Principles of circular economy

The circular economy is based on several principles, including: (Raziq & Sawalhi , 2020, p. 18)

- ✓ **waste feeders**: There is no waste, biological and technical components are intentionally designed to enter the materials cycle;
- ✓ **Diversity is strength**: Diverse products, materials and systems with more connections and standards be more flexible to face the external shock ;
- ✓ **systems thinking**: seeing things as affecting each other in an integrated framework and considering them appropriate for infrastructure, environment and society;
- ✓ **Prices and other** feedback mechanisms should reflect the true cost: In a circular economy, prices act as instruments, therefore it must reflect the full costs in order to be effective, including negative externalities.

3.4 The objectives of Circular economy

The circular economy aims to meet the challenge and it is to meet the growing needs of consumption while preserving as much as possible the resources. The circular economy focuses on four goals: (Magdy , 2016)

- ✓ resource protection;
- ✓ sustainable production;
- ✓ rationalization of consumption;
- ✓ Creating value through recycling.

3.5 Requirements for the transition to a circular economy

The requirements for a circular economy are as follows: (Tommy & Shaybout, 2021, p. 9)

Digital transformation helps transitiont towards a sustainable circular economy ,Because it helps to provide accurate information about the availability of materials and products and making operations more efficient, reducing waste, reducing costs, and increasing the efficiency use of resource ;

- ✓ The circular economy requires fundamental transformations
- ✓ in design, production, consumption, use, waste, and the practice of reusing resources and products
- ✓ The transition towards a circular economy requires an ecological culture, environmental awareness, and the modification of behaviors and attitudes.

3.6 Contribution of the circular economy to sustainable development

Every year global consumption doubles compared to the produced resources in the earth due to demographic and economic growth, therefore, the challenge that must be met is to meet the increasing needs for consumption with the province as much as possible of the resources. The World Bank report shows that the amount of waste is increasing in the world every year, and the report confirms that waste management is very important for sustainable, healthy and inclusive cities and communities. Because of the circular economy, waste has become a resource, not a burden and this is due to the technologies for converting environmentally beneficial waste into resources. (Habri, 2019, p. 9)

4. The reality of the circular economy in Algeria

The circular economy in Algeria is based mainly on supporting the waste recycling sector without paying attention to other aspects and foundations, This poses a new challenge to the Algerian authorities on how to adopt the principles and pillars of the circular economy as an integrated socio-economic system that has very positive effects on environment and sustainable development.

The waste management policy is part of the national environmental strategy(NES), as well as the national environmental action and sustainable development plan, This strategy resulted in the issuance of Law No 01/19. issued on December 12, 2001 and related to management, control and disposal of waste, which aims to embody the following basics: (Massoudi, 2020, p. 742)

- ✓ Reducing waste generation and its damages at the source;
- ✓ Organize sorting, collection, transportation and waste treatment;
- ✓ Waste valuation through reuse and recycling;

- ✓ proper environmentally treatment of waste;
- ✓ Informing and educating citizens about the dangers posed by waste its impact on public health and the environment.

The creation of the public system for the recovery and valorization of packaging waste in Algeria, also known as(eco-jem) and this is according to executive decree No.199-04 issued on July 19, 2004, Which determines the procedures of establishing, organizing, operating and financing the system under the supervision of the National Waste Agency(NWA).

In fact, Executive Decree No. 02-372 of 11 November 2002 on packaging waste (Article 03) obliges the generators and / or holders of packaging waste to make a choice among the following processes:

- ✓ Self-valuation: by ensuring the recovery of their packaging waste themselves and at their own expense.
- ✓ Specialized company: by entrusting the recovery of their packaging waste to approved companies.
- ✓ Eco-Jem: by joining the public packaging waste and recovery system.

The following figure shows the ways and mechanisms of (Eco-jem) work in Algeria: (National Waste Agency's, 2017)

Fig.1. Methods and mechanisms of (Eco-jem) action in Algeria

Source: National Waste Agency's website: https://bit.ly/2YPWv7N

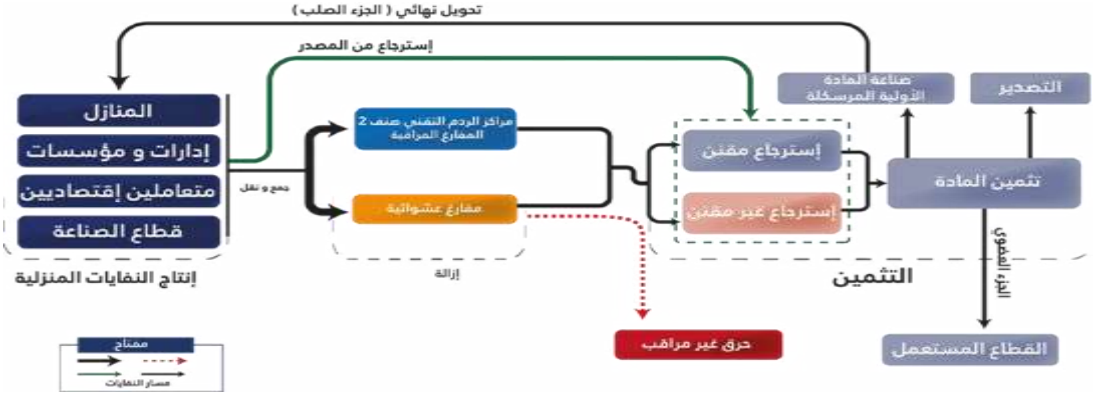
4.1 The state of waste in Algeria

The various kinds of waste are considered one of the contemporary environmental problems facing most countries of the world. As a result, most countries have adopted a sustainable and integrated approach in managing household waste, so they have adopted all legislations, whether international or national, to pay attention to them through various measures to eliminate waste.

Algeria, like other countries, has realized the danger and aggravation of household waste, so it changed its legislation by trying to put in place an effective waste management system in consideration sustainable development.

Some national statistics about household waste in Algeria: (waste management in Algeria, 2020)

Fig.2. A comprehensive scheme for managing household waste in Algeria



Source: National Waste Agency, Report on waste management in Algeria, 2020,p:30

The production of household waste depends on two main factors:

- The number of waste producers (houses, and economic and administrative entities);
- The daily per capita production of this waste (mass / product / day), which is related to each type of waste Producer.

In order to measure the quantity of the produced household and similar waste, The Ministry of Environment commissioned the National waste Agency
to make a national study for the quantitative assessment of household waste. This study aims to weigh the amount of waste generated from door to door, in order to obtain more reliable and accurate data.

The graph below shows the evolution of household waste production according to the two scenarios 2035-SNGID, which are:

- **Scenario 1**: (BAU) Business As Usual No action has been taken regarding the preventive management of waste household.
- **Scenario 2**: start the application of the recommendations proposed in 2035-SNGID

Fig.3. The evolution of the amount of produced household and similar waste between 2016 and 2035

Source: National Waste Agency, Report on waste management in Algeria, 2020,p -31

In the case of scenario business usual, household and the like waste production can double between 2016 and 2035, more than 11 million tons in 2016 to 23 million tonnes in 2035, This increase should be limited to 20.5 million tons in 2035 in the case of implementing the strategy, about less than 10% of the waste generated compared to the usual business scenario, because of the implementation of preventive measures (communication, house composting, etc.) and financial incentives. Algeria is a large country in terms of its area, it ranks tenth in the world with a very diverse population distribution (very high population density in the north and very low in the south, and the economic activities are concentrated in urban areas and major capitals, and therefore there is a big difference in waste production between the states of the country. At the national level, the quantities of household and similar waste produced are estimated at 0.80 kg ./ individual / day.

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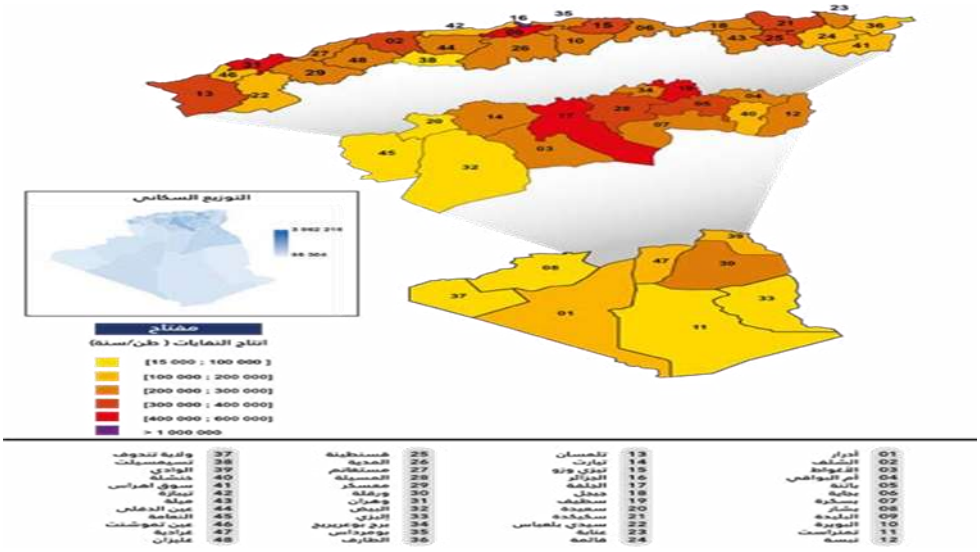
The states of the south are those that produce the least amount of household waste and the like (less than 100,000 tons/year), due to the low population and lack of economic activity . Northeastern Saharan states such as El-Wadi, Ghardaia and Adrar, the production of household waste and the like is between 100 and 200,000 tons/year. This is mainly due to the high population compared to other states in this region. North Saharan states, in this case Biskra, Laghouat and Ouargla, where there are more economic activities, the production of waste is biger. The state of Algeria has the highest waste production with more than one million tons/year), because economic activities are concentrated there with a greater population density.
Followed by the most populous states, Oran and setif which recorded a high production of household waste (between 400 and 600 thousand tons / year).
From a chronological point of view, the production of household waste and the like is constantly increasing, due to population growth and urban development. And from a spatial or regional point of view, it is high in the north of the country and low(even very low) in the southern states and very high in the state of Algiers.
The following figure shows the distribution of waste by states in Algeria for the year 2020:

Fig.4. A map representing the production of household waste and the like in Algeria 2020



Source: National Waste Agency, Report on waste management in Algeria, 2020, p:33

4.2 Waste recycling and treatment

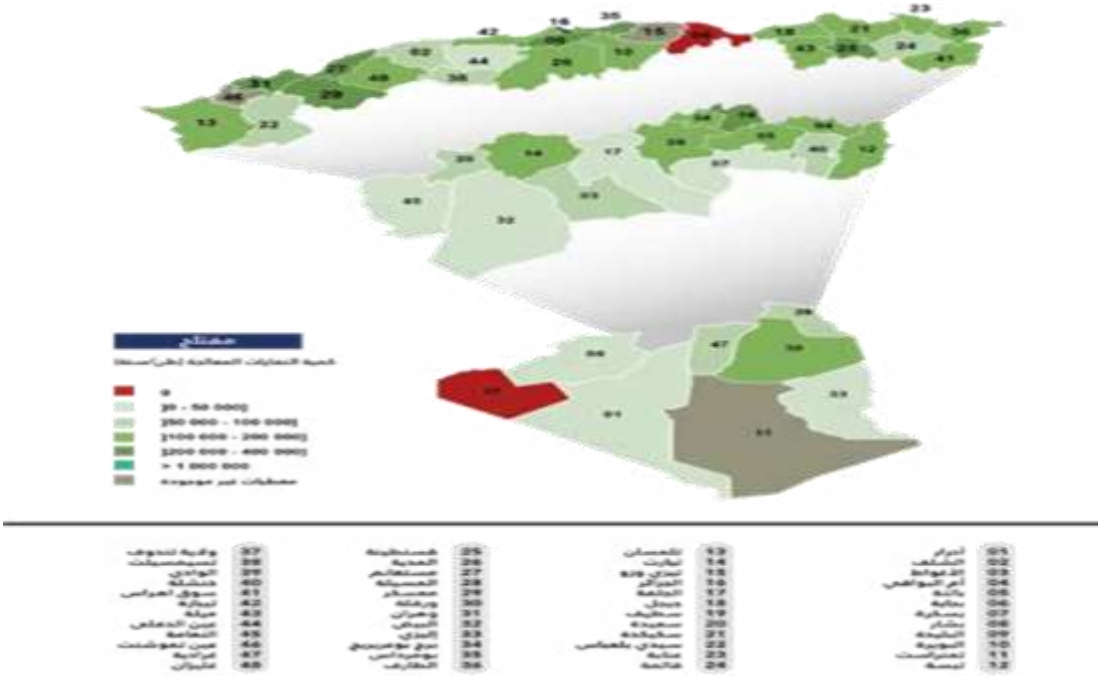
4.2.1 Waste treatment

In 2020, the treated quantity of household and similar waste was evaluated in technical backfill centers and controlled emptying. Where it was estimated at 6 million tons (National Waste Agency), with a treatment rate of 45% compared to the total quantity produced, estimated at 13.5 million tons.

The map below shows the estimated annual quantities of household and similar waste that are treated by state. It should be remembered that:

- ✓ The national collection rate is less than 100% (between 85 and 90% in urban areas and less than 70% in rural areas.

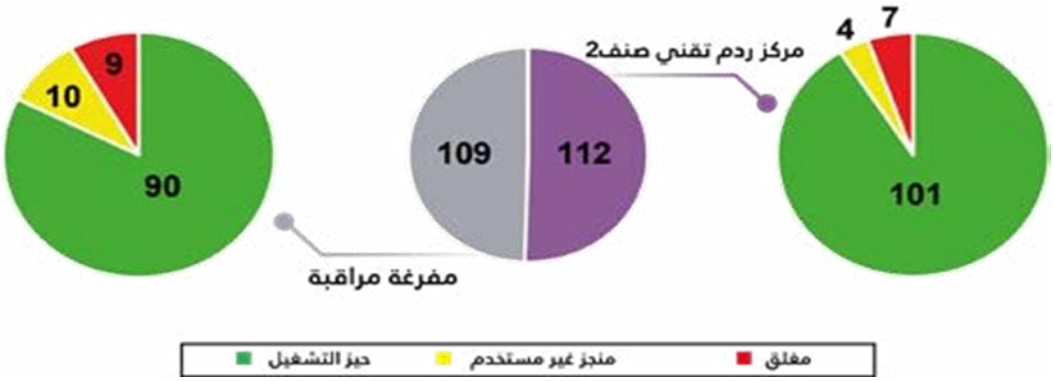
Fig.5. A map representing the prduction of household waste and the like in Algeria 2020



Source: National Waste Agency, Report on waste management in Algeria, 2020, p:76

To date, 221 treatment facilities have been built, including 191 operating facilities, 101 class 2 facilities, and 90 controlled vacuum facilities. It is shown in the following figure:

Fig.6. The number of household waste facilities and the like 2020

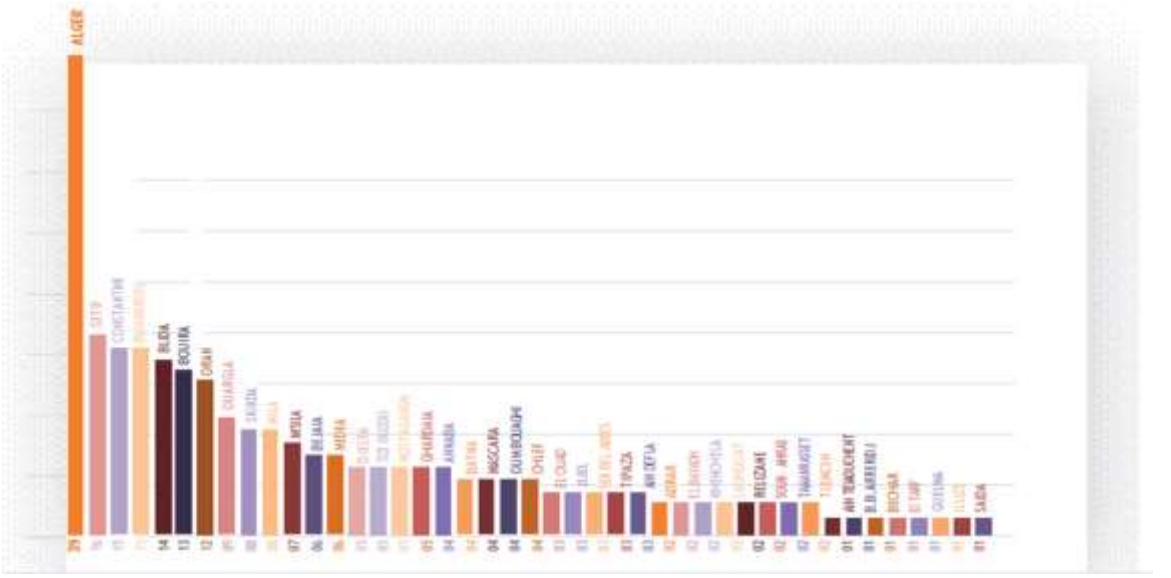


Source: National Waste Agency, Report on waste management in Algeria, 2020, p:77

4.2.2 Waste recycling

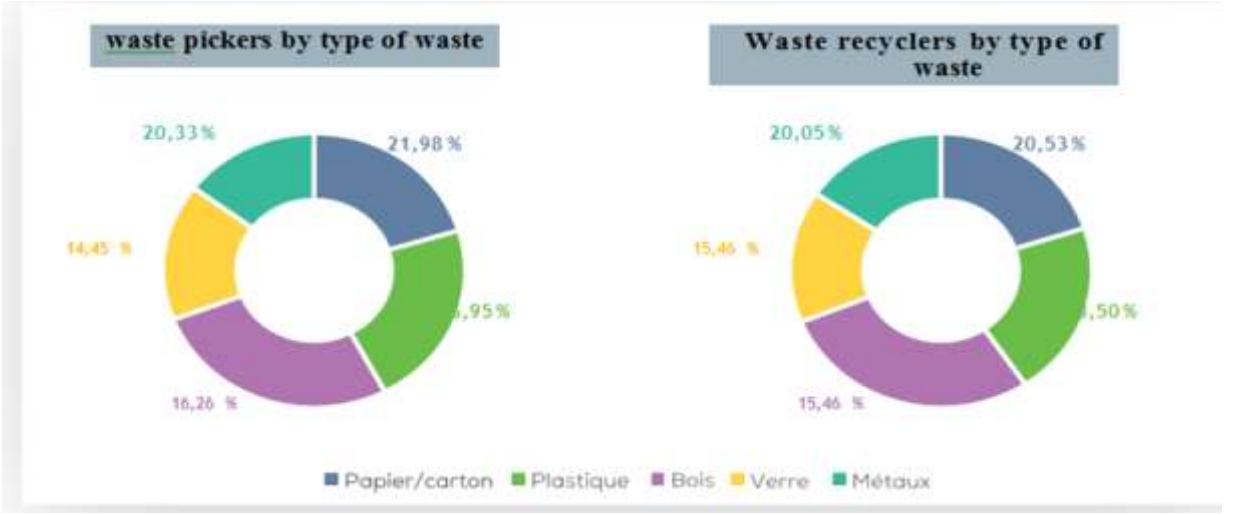
In this part, we will present the reality of recycling In Algeria, whether through institutions that are active in this field, or recycled materials, for the year 2017:

Fig.7. Distribution of recyclers by state



Source: National Waste Agency, Report on waste management in Algeria, 2017, p:9

Fig.8. waste pickers and recyclers by type

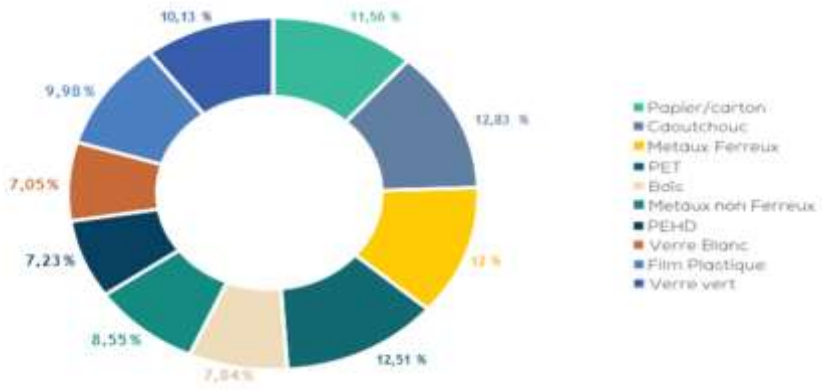


Source: National Waste Agency, Report on waste management in Algeria, 2017, p:9

It is obvious from the results of the graphs above, that cardboard and plastic are the primary sources of feed for the various waste recovery

channels, On the one hand, thanks to the experience gained by the operators especially in the field of recycling, On the other hand, the majority of these materials are used in product packaging.

Fig.9. waste pickers by category



Source: National Waste Agency, Report on waste management in Algeria, 2017, p:10

In implementation of the commitments of the President of the Republic, especially his commitment No. 33 aimed at ensuring a quality living environment that respects the requirements of sustainable development and the preservation of the environment. , The Ministry of Environment implemented the measures contained in the roadmap for the first half of 2021, with giving priority to those who have a direct impact on the quality of life and the environment for citizens:

- **Optimization of waste management**: The measures implemented by the Ministry of Finance during the first five months of 2021 allowed the following:

✓ Continue operations to eliminate uncontrolled landfills;
✓ Creation of 03 technical centers for landfilling in Mascara and Oum El Bouaghi;
✓ Reception 02 controlled landfills (Bechar, Tizi Ouzou
✓ Recovery of organic waste through the construction of 03 composting stations in the states of Sidi Bel Abbes, Mostaganem and Mascara
✓ Delivery and commissioning of 09 leaching treatment plants.

- **Repair procedures:**

- ✓ Management of asbestos waste: in the localities of Meftah, Bordj Bou Arreridj, Zahana, Gué de Constantine with the launch of calls for tenders in March 2021.

- **Control, surveillance and prevention of pollution sources**

Within the framework of the implementation of this inspection programme, which was launched in 2020 and continued in 2021, three types of actions were implemented during the first five months:

- ✓ 111 Inspection and control of priority classified facilities;
- ✓ 65 Inspection and control of facilities classified as in danger;
- ✓ 785 periodic inspection and control visits.

5. Mechanisms for activating the circular economy in Algeria

In the light of the growing global trend towards applying the principles and foundations of a circular economy, because it is the appropriate tool that reconciles the optimal use of resources, preserving the environment and achieving sustainable development. Therefore, Algeria must keep pace with developments and challenges, and for the future activation of the foundations of the circular economy in Algeria a set of mechanisms and requirements must be taken into consideration. (Massoudi, 2020, p. 742)

- ✓ Increasing the current rates of waste recycling in Algeria Ggradually;
- ✓ Activating the concept or principle of "3R" in Algeria, as it is the main pillar of the circular economy;
- ✓ Reducing the use of traditional fossil energy sources that pollute the environment;
- ✓ Promoting the use of renewable and clean energies in Algeria;
- ✓ Stimulating and encouraging interest in environmentally friendly inputs;
- ✓ Striving to produce quality and durable goods;
- ✓ Encouraging the use of waste in the field of energy generation.

6. The future prospects of the circular economy in Algeria

Algeria has approved a new national strategy that is concerned with achieving integrated waste management in the horizons of the year 2035, In order to adapt to environmental challenges and developments at the international level especially

with regard to the circular economy. This strategic plan aims to develop a national strategy to support and develop sorting and waste recycling processes.
The potential outcomes of this strategy for 2035 are as follows:

- ✓ Reducing waste generation: 10% reducing household waste and the like;
- ✓ Waste valuation: contribution to the national economy with an amount of 80 billion dinars;
- ✓ Disposal of landfills: disposal by 2024;
- ✓ Increased private sector participation: a potential public-private partnership worth 54 billion dinars;
- ✓ Job creation: 100,000 jobs (30,000 direct and 70,000 indirect);
- ✓ Environmental benefits: net greenhouse gas emissions reduction per year of 45 million tons, equivalent to $150 billion.

7. The difficulties of implementing a circular economy in Algeria

There are a number of challenges and difficulties facing the implementation of the circular economy in Algeria, including:

- ✓ Recycling operations are only in the field of plastics, due to lack of investment in recycling;
- ✓ Irregularity of the recycling process itself;
- ✓ The lack of effectiveness of central policies and environmental programs related to waste management policy in Algeria and not integrating it with the foundations of the circular economy;
- ✓ Lack of awareness programs about the circular economy, whether for producers or consumers;
- ✓ Lack of control over modern technologies that are used in waste recycling.

8. CONCLUSION

The circular economy is of great importance in achieving sustainable development on the one hand, and preserving the environment and resources On the other hand. Therefore, all countries of the world seek to implement the principles and concepts of the circular economy on the ground. Algeria, like other developing countries, is heading towards this path to meet the environmental and economic challenges facing the world, represented in the transition from a linear economy to a circular economy because it is more economically efficient and environmentally sustainable.

Through this research paper, we can derive the following results:

- ✓ The circular economy is a global focus of attention,
- ✓ The circular economy is an important tool for achieving sustainable development,
- ✓ The goal of the circular economy is to meet the growing needs of consumption while conserving as much as possible the resources;
- ✓ The circular economy in Algeria focuses primarily on the process of recycling waste,
- ✓ The circular economy is an integrated socio-economic system,
- ✓ The success of the circular economy is closely related to awareness and sensitization campaigns.

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