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Review Article about Environmental Waste Recycling and Environmental Security

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Annotation: Waste recycling plays a crucial role in enhancing environmental security by reducing pollution, conserving natural resources, and promoting sustainable development. Despite growing awareness of its benefits, many countries still face challenges in implementing effective waste management strategies. This review examines the environmental, economic, and social dimensions of waste recycling, highlighting its impact on reducing pollution, lowering production costs, and generating employment opportunities. Through an analysis of existing studies, this research identifies key factors influencing recycling efficiency and proposes solutions for improving waste management practices. The findings suggest that integrating recycling into national policies can significantly enhance environmental security and economic

sustainability. This study underscores the need for increased public awareness, governmental support, and technological advancements to optimize recycling processes.

Keywords: Waste recycling, environmental security, sustainability, pollution reduction, waste management.

1. Introduction

Waste is defined as all materials resulting from any consumer or other activity that leaves residues that must be treated or disposed of. These are materials that are released into nature as a natural result of biological, medical, industrial and agricultural activities and are represented by all materials resulting from those that are disposed of because the benefit has ended or they are more than needed (Mohammed Ibrahim Al-Daghri, 2012). It may cause harm to humans or the environment directly or indirectly if it is not disposed of in peaceful ways. Waste exists in several forms, including solid, liquid and gaseous waste resulting from natural, industrial and domestic activities. Most of these materials can be recycled, reused and used as raw materials for new industries (Sati' Mahmoud Al-Rawi, 2012). Recycling is the collection, separation, sorting and subsequent processing of waste materials in order to produce marketable materials that are similar to the original but of lower quality or other new materials with different uses, which makes these materials valuable in addition to creating many financial, environmental and social benefits for the state, such as converting waste paper into new paper. While reuse or reuse refers to the reuse of a product or material again after carrying out a repair or renewal process, regardless of whether these products were used for the same original purpose or for another secondary purpose. It is also expressed by introducing recovered materials for economic use without making any changes to them (Fatima Zahra Mamouni, 2020). During this research, we will reach the concept of environmental security, which means the ability to rely on the continuity of the work of natural systems, their non-depletion, and the protection of the environment and its resources from threats such as environmental pollution of air, water, and soil, and the imbalance of the environmental balance (Amina Deir, 2014). Environmental security, like human security, is a research project for critical security studies, through its use in raising questions about who and what we believe in? and from what threat?, which requires great attention, and clear definition with the setting of strategies and mechanisms for preserving environmental security and ensuring His stability (Samra Boustilla, 2013).

Waste They are all materials resulting from human activity, which have been disposed of due to lack of benefit or because they are more than necessary, and may result in harm to humans or the environment directly or indirectly if they are not disposed of in proper ways (Khalaf Hussein Ali Al-Dulaimi, 2009)

Pollution of all kinds, whether material or non-material, is one of the most prominent problems facing the world today, especially in urban communities in cities, where the percentage of pollutants in the air, soil, water and even social pollutants has increased, due to the density and population increase and the accompanying increase in urbanization and consumption, and thus the increase in the production of waste of all kinds, which comes at the forefront of household waste, which is considered one of the main sources of pollution. This household waste, whether organic or synthetic waste, and with the inability of developing countries in particular to keep pace with the situation regarding waste management, the phenomenon has worsened over time, and its

effects have become looming on the horizon, and the problem of household waste has become one of the most important and prominent problems that developing countries suffer from, including Iraq. Waste characteristics and type A- Waste characteristics:

Waste has characteristics that distinguish it and can be summarized as follows Waste or remnants: Any waste is the remains or residues generated from a certain activity. It is either direct consumption waste or waste from production, transformation or use processes. It may appear in things that are left, neglected or abandoned intentionally or by forgetfulness. Solid, semi-solid or liquid: either solid and cohesive, such as stone, building rubble and metals, or liquid, such as sewage water, or soft, i.e. semi-solid, such as weapons and hospital waste (Miloud Toumi, 2002). Natural, organic or artificial: natural, such as leaves and branches, organic, such as corpses, and artificial, such as factory waste, crafts, etc. Dangerous or nuisance: Dangerous, such as toxic, radioactive, explosive and flammable waste, i.e. it contains varying amounts of toxic elements. As for nuisance, it is large in size and may obstruct the road and requires its removal from roads and public spaces Inert or decomposed: Inert means that it does not undergo any change over time. In other words, it does not burn or produce any chemical or physical reaction such as corrosion, explosion, ignition, etc. It also does not decompose and is not dangerous. As for decomposed, it means that it can decompose aerobically or anaerobically like organic materials. Treatment capability: whether by collection, transportation, sorting, recovery or final disposal, but health, cleanliness, safety, good use and the amount of costs incurred by treatment must be taken into consideration. The property of quantity, density and components: They differ from one country to another, from one city to another, within the same country, and from one region to another in the same city, in addition to the seasonal factor, as the quantity, quality and hazard of waste differ from one season to another (Douar Jamila, 2012). for-Types of waste First) Types of waste in terms of their origin and composition: Biological origin: It is called organic waste and refers to waste generated from nature, such as leaves, branches, corpses, vegetables and fruits, and it is biodegradable Non-biological origin: i.e. newly created, of industrial origin such as plastic and synthetic fibres, or resulting from the remains of technological industries, and includes: olid or inert waste: including construction rubble and car bodies. Chemical waste: arises from a chemical reaction between two or more substances. Hazardous and toxic waste: These are the wastes of various human activities, industrial and agricultural, pharmaceutical preparations and paints.

Second) Types of waste according to their source: Household waste: This includes household and residential waste, which is placed in individual or collective containers and removed by municipal workers. It also includes sewage water. Hospital waste: This includes medical waste and is considered dangerous because it is infectious, so it must be collected separately. It can be organic or inorganic. Commercial waste: This is waste generated by commercial complexes and its source is exhibitions, offices, shops, hotels, and market waste (Manahi Al-Azmi, 1988)

Urban waste: such as waste from parks, public squares, sweeping public roads and green spaces. Industrial waste: It is the result of manufacturing or converting raw materials or various industries such as food industries and slaughterhouse waste. The type and quantity of industrial waste varies according to the type of activity or industry and the method and production (Abdullah Al-Daboubi,and so on2010) Electronic waste: It is everything that is left over from the production or use of electrical and electronic devices by the consumer, their parts and accessories, including televisions, computers, audio devices, cameras, phones and video games. It contains percentages of lead, zinc and metals and is hazardous waste because it contains toxic components (Nafisa Abdullah Farah Hamadto, 2016). Radioactive waste: It is emitted from nuclear facilities, factories and laboratories and requires special material and human resources to treat it. Agricultural and farming waste: Its source is agricultural and farming activities, plants and animals, and waste generated from raising animals and birds (animal droppings) (Ibtisam Abdel Salem Beer, 2007).

Third Types of waste according to their physical state:

Solid waste: is the solid waste resulting from various household, industrial, craft, commercial,

agricultural and mining activities such as wood, glass and metals (Naglaa Alaa El-Din Ahmed Ibrahim, 2018). Semi-solid waste: meaning soft waste such as food waste, vegetables, fruits, meat and slaughterhouse waste Liquid waste: It is liquid waste resulting from household or industrial activities. It is a mixture of liquids and water carrying dirt, such as water resulting from detergents, such as sewage from washing water, bathrooms, kitchens, toilets, various industries, used oil waste, and liquids or juices of waste and waste (Amal Makki Abdel Rahman Babiker, 2019).

Gaseous waste: It is the fumes and gases resulting from factory chimneys and even in homes from the heater and during cooking (Warda Khilaf, 2019). Radioactive waste: such as waste from nuclear reactors. waste recycling: Recycling is the process of remanufacturing and reusing waste, whether household, industrial or agricultural. For example, we can recycle old newspapers into cardboard plates, remanufacture old metal cans to provide new cans, and remanufacture scrap metals to obtain new alloys that can be used in manufacturing different products. The purpose of reuse is to reduce the volume of this waste and thus reduce its accumulation in the environment. This process is done by classifying and separating the waste based on the raw materials in it and then remanufacturing each material separately (Nebras Muhammad Abdul Rasool Al-Saffar, Ali

Jassim Muhammad, 2020 Stages of the recycling process: Collection: Modern methods of collecting waste for recycling include: Establishing collection centers by allocating a small area equipped to receive recyclable materials, which are purchased for a nominal sum and earned to facilitate their shipment, and placing collection containers near commercial centers, so that the nearest collection center can collect them (Fayrouz Bouzoureen, Fayrouz Gerard, 2019) Transportation: The process of transporting the collected waste from its sources of generation to its receiving sources. To be treated by special waste transport vehicles (trucks), provided that the transport process is carried out According to specific conditions and with high efficiency without leakage or waste falling, in addition to adhering to specific dates and not transporting and merging hazardous waste with household waste. It is also prohibited to transport Hazardous waste without obtaining a license (Abdul Haq Al-Qunai'i, 2016) Sorting: If there is a recycling plan or program, measures and procedures are taken to collect Waste that is partially or completely sorted at the source, in order to achieve the efforts made in sorting work and reduce the costs resulting from that, the sorting process may start from homes, industrial establishments and commercial centers by placing each type of waste in a special box, but what is common in most developing countries is that the separation or sorting process takes place in collection centers near landfills or incinerators where appropriate machines and equipment are used to separate the main components (Fayrouz Bouzoureen, Fayrouz Gerard, 2019). Benefits of recycling: Dispose of waste in a proper and civilized manner. Reduces health and environmental problems caused by waste accumulation.. Reducing production costs by providing recycled raw materials at low prices. Preserving natural resources and energy, not wasting them, and reducing their depletion. Providing job opportunities, reducing the percentage of imports from abroad and encouraging investment. Reducing pressure on landfills by reducing their size through recycling and saving land space. Reduces financial spending allocated to treat diseases resulting from waste pollution (Salah Mahdi Al-Zubaidi, 2012).

2. Environmental security concept

It means the ability to rely on the continuity of the work of natural systems, their non-depletion, and the protection of the environment and its resources from threats such as environmental pollution of air, water, and soil, and the imbalance of the environment.

Procedurally: The study adopts the definition of environmental security as the level of countries in protecting the environment and the safety of its resources from threats resulting from the accumulation of solid waste and its unsafe disposal, by measuring the performance of countries in (air and water quality, agriculture and climate change) according to the index.

Amina Deir (EPI) 2014).

Axes of achieving environmental security through recycling

First) The environmental dimension of the recycling process:

The process of recycling waste contributes fundamentally to reducing pollution of all kinds by reducing the accumulation of waste that contributes significantly to environmental pollution due to the release of polluting gases and toxic elements into the air, water and soil, in addition to its role in reducing the pressure on waste collection and burial sites (landfills), as waste burial sites are near cities.

Civilization causes great pollution and can cause fires, explosions, and distort the landscape and natural beauty of those areas. Sorting and recycling waste reduces the use of landfill sites and seeks to eliminate them completely as much as possible (Ta'meem Muhammad Saloum, 2015).

Second) The economic dimension of the recycling process:

The process of recycling waste contributes to achieving economic benefits for society as well as for future generations by preserving natural resources and wealth. This importance lies in the following: Reducing the cost of solid waste disposal by extending the life and life cycle of sanitary landfill sites, especially in light of the increasing population growth that has led to an increase in the amount of waste in urban cities, and benefiting from those funds in other allocations that benefit the individual and society. Reducing economic expenditures and helping countries face challenges related to the rise in prices of raw materials such as oil and coal, as it has made it possible to reduce the cost of production as a result of the decrease in the tax bill, customs duties, insurance premiums and transportation. In some cases, landfills may be dispensed with and used in other investments and projects that benefit the individual and society. This also contributes to providing large financial resources, as the establishment of sanitary landfills requires the presence of huge water resources in addition to reducing the costs of collecting, transporting and disposing of waste. A competitive opportunity for production factories to obtain materials or parts of materials at a lower price than if they were natural or new materials, which makes them better able to reduce costs and thus the final price of the product, thus benefiting a wide social segment of consumers whose circumstances may prevent them from purchasing original or new goods that are more expensive than them. Reducing public and private spending on treating diseases and injuries resulting from the effects of solid waste, and the process of safe and sound disposal of waste through the recycling process contributes to reducing the spread of diseases due to waste, insects and rodents, in addition to contributing to the preservation of natural surface and groundwater resources (Abdul Haq Al-Qunai'i, 2016)

3. The social dimension of the recycling process:

The social importance of recycling lies in the following: Reducing the unemployment rate by creating new job opportunities in collecting and sorting various wastes and transferring them to factories specialized in recycling them. The process of recycling and sorting waste develops the spirit of citizenship in society and gives it a social responsibility towards the environment in which it lives, which leads to increasing its awareness to preserve the environment and thus reducing diseases that affect humans. Impact on production, as most studies confirm that a person who lives in a clean environment has a better production rate than one who lives in a polluted environment. The recycling process increases the beauty and splendor of the city, which leads to the revival of tourism and trade (Ta'meem Muhammad Saloum, 2015)

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