Ishtar Journal of Economics and Business Studies (IJEBS), Volume 3 (2) – (2022) ISSN: 2708-6186

Participation in corporate and individual social responsibility and their role in the management and marketing of solid waste in Iraq from the perspective of sustainable development

Dr. dejla J. Mohammed
Technical Institute of Kufa, Al-Furat Al-Awsat, Iraq.
dejla.mohammed@atu.edu.iq
Dr. Sanaa J. Mohammed
Technical Institute of Kufa, Al-Furat Al-Awsat, Iraq.
Kin.sna@atu.edu.iq
Dr. Ali Aboudi Nehme Al-Jubouri
Imam Al-Kadhum College (IKC), Iraq.
aliabboodineamah@alkadhum-col.edu.iq

Abstract

Waste treatment in low- and middle-income countries with economies and a growing population is an emerging and crisis problem. Increased consumption with environmental issues requires well-functioning and highly responsible waste systems. Through the significant challenges facing the Earth in terms of climate change, natural resources and energy. Waste is therefore the main source of post-consumption emissions related to methane from landfills and sewage. As economies grow and cities grow, population consumption grows rapidly. Hence the need to increase recycled materials and reduce waste generation. Through recycling, this money, resources and environment are provided as the first step. The next step in the issue is the final disposal of waste, which is a political problem that is more than economic. Although recycling is the best way to treat waste, not everything can be recycled. The final disposal method is therefore necessary immediately. Mainly, three methods are used for final disposal today; Sanitary landfills, open landfills and incinerators, all of which have advantages and disadvantages in terms of the environment and the economy. Local waste treatment is a topic of debate and a growing problem. The official method now in Iraq for final disposal is sanitary landfills, which are treated by waste treatment companies hired by the local government, but a number of secret open landfills are also distributed throughout the city. This method of waste care is not sustainable in the long run and is also very expensive. In addition, the peak of the landfill space reached in 2012. There is no longer room for new landfill sites. The introduction of burning was not an option because it was illegal. We therefore propose the Green City project in an effort to reduce the amount of waste generated, reduce the amount of waste that ends up in landfills and increase the rate of recycled materials. The first step in the improved waste management system is to identify key issues and possible ways to reach the goal in the end. In this search has been A set of recommendations, including a proposed feasibility study for the construction of piston plants and the recycling of plastic waste, have been reached. Through this research, we will specialize in a feasibility study for the recycling of plastic waste .

Keywords: Investment, Marketing, Sustainable Development, Local Economy, Companies, Plastic.

Introduction

In this research, the main challenges of waste recycling in Iraq are identified and discussed, based on interviews, study visits, reports and articles. In addition, future scenarios are analyzed and discussed. Solid waste management in industrialized countries in the latter half of the

twentieth century therefore focused on well-defined engineering systems, while the main objective in developing countries was assembly and removal. This is a simple comparison .
Studies have shown that different approaches to solid waste management are needed in developing countries today. Due to a number of factors such as (population growth, inequality, economic growth, politics and governance, cultural and environmental aspects, and international influences), The introduction of solid waste management in various developing countries must be specifically studied and formed so that we can access a system that works successfully and compare it with the methods used successfully in industrialized countries, the development of new approaches is of great importance. This means more complex thinking in the system, including a number of different factors, using the perspective of sustainable development. In some cases with regard to special administrative decisions in solid waste management, there is a tendency to take them without adequate planning, leaving some aspects out of the question, by looking from a short-term perspective or being influenced by political interests. Solid waste management is not just a technological problem; it is more comprehensive than that. It is a combination of institutional, social, legal and financial aspects involving coordination and cooperation with many relevant managers, staff and the public. Therefore, well-functioning solid waste management requires careful consideration of local conditions. Therefore, in this research we will work on a project on how to manage and market that waste, especially plastic, in a planned and orderly manner.

Methodology:

Problem of Study:

As Iraq's provincial population grows rapidly with growing economies and available wealth, solid waste management (SMW) is a growing issue for developing countries in the world. As economic growth changes consumption patterns and global as well as local and regional issues associated with waste work, the solid waste management system is increasingly important. Since the 1960s, various engineering models and systems have been applied to cities in developing countries with the aim of facilitating decision-making and improving existing solid waste management systems. What these models do not include is Social and cultural aspects of solid waste management systems; in many cities in developing countries, a large number of people rely on the collection and sale of recyclable materials for livelihoods, so-called garbage dumping, and play a major role in the city's recycling system. By applying a comprehensive perspective when studying the solid waste management system for cities in low- and middle-income countries, as some modern models do, there is an ability to study social, cultural, environmental, economic, political and technical linkages and interactions. So it means from a sustainable development perspective. This project includes a case study of Najaf, Iraq. The project describes the management of the city's historical solid waste and how it can be changed to date. which was of great political, technical, social and economic importance. The project also discusses major problems and the future of solid waste management in Iraq.
Najaf province is the capital of culture and also the second largest religious city in Iraq, located in central Iraq. The city is geographically located in a flat natural area connected to the Euphrates River. Iraq is a country with a population of approximately 42 million, 90 percent of whom live in urban areas. The amount of solid waste varies greatly between urban areas and the rest of the provinces, with a population density of less than 100,000 people per square kilometer. In these provinces, the amount of local solid waste generated per person is calculated today to 0.44 kg, while the corresponding number in urban areas is calculated to 1.52 kg in 2010. The whole country is divided into 18 provinces. There is a clear difference between Najaf province and the capital Baghdad. Najaf province consists of approximately 8 municipalities, all of which have municipal governments and laws. This means that solid waste management is organized at the municipal level as it has been introduced. In 2012, the average daily solid waste generation in the entire province of Najaf was 11,000 tons, which today grew to nearly

13,000 tons per day. Our project is therefore made up of a landfill company that has the primary responsibility for the treatment of all this waste. Najaf province also has a large number of secret open landfills, which are prohibited by law, but are still in use. With regard to recycling possibilities, there are no or few possibilities for recycling in homes. In some parts of the city, residents have the possibility of separating recyclables from non-recyclable materials if a law is imposed, but not more specifically. Most residents have only one container for mixed waste. In the past two years, recycling plants have been installed in public places in simple parts of the state. Right now, there's One material recycling treatment plant is located in Mahmoudiyah. Each municipality deals with waste treatment itself. To date, there are no national legal limits with regard to the detention of landfill gas. There is no legislation to protect the environment and human beings, but only recommendations. In 2005, zero waste law was implemented, including four future targets in developed countries. Our project aims to reduce the amount of solid waste placed in landfills by 30%, 50% by 2020, and 75% by 2023.

Why is plastic recycling important and what challenges face the industry?

Objectives of Study:

This project will lead to a deeper understanding of recycling and solid waste management (SWM) in Iraq. This will be done with the help of historical, technical, political and cultural studies. The project will be implemented from a sustainable development perspective. The project will give a deep and comprehensive picture of solid waste management and recycling sectors to iraq's private sectors, so that we can identify weaknesses and strengths in the system. These potential future scenarios will be compared and discussed from a sustainable economic perspective.

Draft waste management project

Work how:

A set of definitions to clarify as shown below:

1. System: Waste management work system.
2. Laws: Regulations of the system.
3. Ministry: Ministry of Municipalities.
4. Competent authorities: a mixed company specialized in operational waste management

Conceptual Framework

Wastes

We can freely link the occurrence of waste with human origin and its activities, i.e. human life in general. We are free to say that solid waste is products that come directly from human life, regardless of whether a person lives alone, as an individual, or in a society (urban or rural). With developments in the manufacturing process, the amount of waste is undoubtedly increasing, yet the problem of solid waste collection and disposal arises. In fact, it is the problem of human daily life, which is important and difficult within community activities, which are done and must be done to protect the environment, (Jagtap ,2021) In this task we must develop the right and appropriate solution. Population growth and industrialization also contribute to an increase in the amount of waste. Therefore, we have qualitative and quantitative changes in waste, all of which increase the area in which waste is disposed of. Increasing solid waste is a major problem that occurs in our daily lives, for environmental, technological, urban, health, epidemiological, construction, hydrological and energy reasons. Solid waste is a direct product of human life and work and is a complex, heterogeneous substance that can be: (Parida, etal,2018)

1. Inert waste - organic or in organic, which has a long period of decomposition. Depending on where waste is produced and its characteristics, it can be classified into the following categories :

-Mining waste is solid waste that appears as surplus during mining and with it wastewater from modern mining workshops.

Solid waste is waste that arises in everyday life, i.e. residential buildings, squares, commercial buildings and areas (household waste, food waste, agricultural production waste, industry-paper, textiles, wood, plastics, rubber, metals and other wastes).
2. Technological (industrial) waste is waste from production processes in mining and industry (mining and industrial waste), which are generated in mines, institutions and service activities, and differ in quantity, composition and characteristics from municipal waste. The amount of technological waste (mining and industrial) compared to municipal waste is difficult to predict.
3.Hazardous waste is waste containing materials that have one of the following characteristics: explosiveness, interaction, flammability, irritability, toxicity, infection, carcinogenicity, mutations, monstrosity, environmental toxicity, and toxic emission characteristics through chemical reaction or biodegradation.
4. Medical waste, or private waste, is a special type of waste generated in medical health institutions (hospitals, clinics), scientific research institutions and development institutions (institutes), which are produced as the result of the means and materials used in treatment, research and control, the quantities and characteristics differ from municipal waste and resemble waste in its characteristics.
Dangerous. According to its specific characteristics, it requires special treatment. As such, they must be separated from municipal waste, both in the generation process and in the transport process. It is important to note that hazardous waste in agriculture and livestock is very common and has a negative impact on the environment. In fact, in this way there is hazardous waste, which is the product of the use of agricultural crop protection, animal protection in animal husbandry, as well as infectious and hazardous waste through dead and injured animals. From the current practice of waste disposal, particularly landfill landfilling in our country, it can be freely stated that the standards for a single landfill have not been met. As perspectives for the treatment of municipal and hazardous waste, before disposal of waste must be:
(Reducing waste generation; reuse; recycling. Utilizing energy in waste through combustion; removal, etc.) All this aims to eliminate the amount of waste to be disposed of, so hazardous waste can be separated from the benefit.

Solid Waste Management (MSWM) is one of the main challenges facing the world today. The rapid increase in urban areas, together with population growth, high living standards and economic development, has been cited as the main reasons for increased solid waste production. Based on available data, domestic solid waste production in Asia in 1998 was 0.76 million tons per day at an annual growth rate of 2 to 3% in developing countries and 3.2-4.5% in developed countries. This figure is expected to rise to 1.8 million tons per day by 2025 (Damghani et al. 2008). Improper management of the growing amount of domestic solid waste poses serious environmental problems in both developed and developing countries. These problems are more serious in the developing world, as waste collection does not occur at all or does not occur adequately (Pakpour et al. 2014). In developed countries such as the United States of America, Germany and Japan, significant successes have been achieved in waste management due to the development of various laws and regulations at MSWM in recent decades (Potdar et al. 2016 . The cost of successful solid waste management in making changes in attitudes and behaviors as well as public participation and empowerment in waste management programs. Due to the importance of citizen participation in Knowledge programs are the perception or understanding of a person or something, such as information, facts and skills that can be obtained through observation, experience and education. Attitude is the way to think or feel about something and tend to whether it likes to work. Individual attitudes show how they study their surroundings and respect environmental issues. (Jam shidi et al. 2011) we believe that defining the knowledge and attitudes of individuals together leads to community behavior. In other words, knowledge and attitudes are the factors that make people's practice in society. As a developing country, Iraq faces serious environmental and administrative

challenges arising from local solid waste management. The total amount of local solid waste generated in the country is about 65,000 tons per year. Despite the fact that the important part of solid waste in Iraq is recyclable and that more than 77% have good potential for recycled fertilization and the rest is buried mainly in unhealthy ways. (AlJabouri, & Mohammed, 2020).

Developing economies :

Industrial developing economies are generally characterized by inadequate management infrastructure. Collection is not systematic and a large part of household and industrial waste continues to be dumped in many informal and unregulated locations. Informal networks tend to develop and organize well. Recycling must therefore evolve primarily as a reaction to the value of waste, driven by domestic industrial demand. The screening infrastructure is underdeveloped and replaced by informal networks. The processing infrastructure is evolving as a function of the volumes of materials available. Countries in this category can achieve recycling rates in the range of 20%. Developing economies with limited manufacturing recycle very little plastic, logically enough, as waste is less valuable in the domestic market. A large part of the waste ends up in burning, often buried informally. (Al-Jubouri,etal,2020)

Where waste is recycled

Most of the waste is recycled locally, either in the producing country or in a nearby country, but a large export industry has also emerged over the past 30 years. This market mainly includes flows to China, where demand for materials increases, from developed economies (whether they have or do not have recycling regulations). The waste export market benefits from freight rates on tankers through bulk containers at the port. So what happens to recycled plastic? Recycled resins can provide attractive technical properties and are suitable alternatives in many applications. There are as many possible uses for them as they are for raw plastics: bottles, fabrics, packing, cars, household appliances, construction, ... etc. Recycled plastic meets about 10% of global plastic demand. In 2017, Europe exported more than 2 billion metric tons of plastic waste to China. The market is currently in transition as a result of the Chinese government's ban on the import of post-consumer waste, which came into force in January 2018. New markets have emerged across South-East Asia, but they are also likely to ban imports. These changes pose a major challenge to recyclers because they relate to very large quantities. However, the long-term impact of these measures is to encourage local recycling. (Shantha ,2019)

Environmental benefits

Reducing pollution and climate change at the moment, most plastic waste goes to earth or is released into the environment in one way or another. Every year, in Southeast Asia and China, 4 to 12 million metric tons of plastic bottles are dredged into rivers and end up in the oceans. This plastic takes hundreds of years to decompose and poses a serious threat to the marine environment. Plastic recycling also significantly reduces carbon dioxide emissions in the atmosphere, as the use of recycled plastic avoids emitting an equivalent amount of raw plastic. (Grigore, 2017)

Economic and social benefits

Employment, value creation, and self-energy efficiency the development of recycling promotes domestic growth by re-absorbing employment within the country. The plant, which produces about 65,000 metric tons of recycled plastic, usually employs about 300 people. This has more function than that resulting from sending the equivalent amount of waste to the landfill or burning it, or through the petrochemical industry, which manufactures an equivalent amount of virgin resin, and these functions are local. The establishment of a plastic waste recycling system allows the local industry to emerge and restore value from recycled materials. In the absence of recycling, energy recovery is the only possibility of generating income. However, since plastic waste recycling systems are logistically more complex than traditional waste treatment systems (separate groups, mixed flows), this leads to higher waste management costs.

This additional cost must be covered by producers and consumers of plastic goods through extended product liability (EPR). The development of this activity also helps to achieve resource autonomy in the use of gas resources, because the manufacture of raw plastics requires crude oil or natural gas. (Al Jabouri, 2020).

Plastic

Plastic is one of the most commonly used materials in the world. As the name suggests - from the Greek word plastikos which means can be formed. This is why it is used for a variety of applications, from everyday products of individual use such as packaging and bottles to products that last for years, such as furniture, clothing, building materials and automotive components. Plastics have replaced a wide range of traditional materials including glass, steel, wood and even concrete. Plastic weighs less, costs less and reduces outstanding technical characteristics. The emergence of plastic coincides with the post-World War II boom years and the prosperity of consumer society. So, plastic is more than just a material, it's the idea of its infinite existence. The amount of plastic already used has grown continuously over the past 30 years, reaching more than 300 million (Ragaert , 2017) The world's most commonly used plastic polymer is extremely useful and cost-effective and can be formed by injection, inflated or formed in a variety of products. Examples include flexible barrier bags (including dual-axis packaging membranes used in the manufacture of potato chips and nuts); stackable boxes for transport and storage, container covers and closures, inflatable bottles, thin-walled containers (e.g. margarine tubs, yogurt cups and food trays) used in the food industry; tree shelters and soil sieves) plastic is used to make a large number of products we use every day, such as: Food and drink containers, garbage bags, groceries, cups, utensils, toys, etc., as plastic consumption has increased over the years, has become a larger part of solid waste, prompting some to consider establishing a plastic recycling project. (Zhang,2011) The nature of accelerated technological progress is easier than ever, helping to dispose of waste and reduce environmental costs and concerns around the world, as plastics adversely affect the environment and organisms.

Therefore, we can say that the plastic recycling project is one of the most successful and profitable projects, which serve the environment and dispose of solid waste that can adversely affect the environment and living organisms, and plastic recycling plays an important role in protecting air and water from pollutants; Through the project, recyclable waste materials must be separated from food waste and other biodegradable waste, in a separate container at the source of waste production, if possible, through a two-container/two waste storage system. We suggest that the waste recycling complex should give a free plastic bag to each house. The bags bear clear marks with recyclable waste, which can also be a bag for easy handling, as they often contain dry waste rather than wet biodegradable waste. This will be replaced when it is full of another bag. In this way, plastic waste is easily separated from other recyclable materials. Biodegradable waste goes to the municipal waste treatment site to compost and recyclable waste can be delivered to this newly operated recycling system. Reusing recyclable waste materials will significantly reduce the cost of treatment as well as meet separation needs and pollution of the environment. The methodology developed here depends on the system's operational ability through three main factors:

1. Responsibility of the administrative and local authority of the province with regard to the management of plastic waste.
2. Harness the private sector to work for waste recycling in a formal system .
3. .Rehabilitation of waste pickers .

There are usually separate containers for the collection of plastics, which are later sorted into valuable fractures and waste. There are two main reasons for this. First, waste is concentrated in emerging household waste, which is more geographically dispersed, making it more difficult

to collect. Secondly, industrial waste is cleaner and better identified than household waste, giving better value to such waste.

Plastic waste recycling machinery and equipment factory

Primary engineering is done by interacting with the industry by focusing on screening systems using technological intervention. Once the products are sorted, they will be sent to the recycling industry and processed. The idea of the plastic recycling project is to establish a specialized plastic waste recycling plant, whether domestic or industrial, with the aim of reducing the impact of these wastes on the environment and reusing them, as large quantities of plastic granules are produced in various industries. This project is one of the projects that achieves a significant investment return, as a result of the heavy and continuous demand for multiple plastic products. After bidding and selecting bidders as a supplier, we found that the cost presented as L1 (minimum cost) was JD (1000) (per unit) by sorting, integrated shredding and transportation (per unit). This price does not include the 10.5% production tax and the 3.20% central sales tax along with other costs.

Plastic recycling project site

The plastic recycling project is one of the projects that do not need distinctive locations, as it can be implemented in industrial areas that are not densely populated, so that smoke does not cause any health damage to citizens, and it will be easy to obtain large areas that help implement, especially in desert areas. There are no doubt that industrial zones have many advantages, such as: rental licenses, easy access to plastic waste from nearby factories, tax cuts, easy access to licenses for the construction of the plant, and for the area of the project must not be less than 5000 square meters; this space is used in manufacturing, production and storage processes.

Details and electrical tools

To get an integrated plant from the ground to turn the key to this facility from waste collection, sorting and recycling, the following electrical elements will be needed for proper and smooth operation.

Table (1) Electrical elements and their details

Details	Items
A KVA 90 adapter will be needed with the necessary work and cover the area with electricity and grounding.	Adapter
• A main control panel (distribution) will be needed inside the shed to distribute power to different engines and lights.	Main control panel
• The distribution panel must contain all overcharging security features and must contain the necessary controls, buttons and lamps.	Cables/wires
• It should also contain conditions for controlling the power factor	Safety features

Source: Preparing researchers by interview with specialists

Table (2) Machinery and equipment in basic detail

Tools	Business details	Quantity
Vibrator	Seismic sifting is needed to separate dust from the waste that will be fed on the sorting conveyor. All the waste collected is loaded on to this vibrator to remove dust.	1
Feeder	The feeder will need to transport waste from vibrator to sorting conveyor	1

Sorting conveyor	This flat conveyor is 800 mm wide. Plastic will be picked up from the carrier and will be disposed of on any of the side carriers (1 to 3). All valuable waste will be sorted manually and the rest will go to the other side for shredding.	1
laundry basin	This tub is used in plastic waste washing processes by placing it in a large amount of water plus some industrial detergents from concentrated liquid soap to wash and get rid of oils and grease.	1
Drying basin	After washing the plastic residues are finished, they are placed in this drying tub until they are sure to be free of any water.	1
Side vectors	Side thongs will be provided to transport sorted waste to fermentation presses.	3
Vertical bale presses	Vertical bale piston will be needed to dispose of sorted waste. Restricted bales will be manufactured and stored for sale.	2
Shredder	The waste is placed on this carrier from the sorting transporter and will be mainly for all waste.	1
Plastic injection machine	This machine consists of a smelting oven in the first stage and works with an electrical heating file and then the spiral injector pierces the plastic smelter during the cylinder to get the desired shape 3 m long through the range of estams used.	1
bins	A number of assembly boxes will be needed next to sorting tankers to collect any exotic materials you need to send to fill the chopped waste. Some boxes will be used to collect materials from side carriers before work.	22
Line of formation	In the future, if the amount of waste is too high, a complete line of co-oration can be created to make granules that can be used to make second-generation plastic products. The full line will include washing equipment and water storage tanks	1
Cooling basin	Once the final product has been prepared through the plastic injection phase, it enters the cooling phase by passing through the sink for refrigeration blinds.	2
Clark	The Clark machine is used to lift plastic waste and transport it to production lines, and is used to transport finished products to warehouses.	1

Source: Preparing researchers by interview with specialists

Specifications on equipment and machinery

Plastic sorting conveyor: A flat conveyor 31 meters long and 800 mm wide. The technical specifications of the carrier are as follows:

1. Offer - 800mm
2. Length -31 meters
3. Height 900 mm
4. Belt specifications - 9mm thick 4 made of cotton chips
5. Strength -5 horse
6. Engine -electric motor with gearbox suitable for slow speed operation
7. Control - Switches are provided on/off at two points to control the movement of the carrier.

Side carrier - sequence 3.

It is a 7-meter flat conveyor that is 800 mm wide and is placed vertically on the separation conveyor. The technical specifications of the carrier are as follows:

1. Width - 800 mm
2. Length - 5 meters

3. Height of 900 mm
4. Belt specifications - 9mm thick
5. Strength - 3 hp
6. Engine -electric motor with gearbox suitable for slow speed operation
7. Control - The operating/stop key is provided to control the movement of the carrier. Vertical bale presses: The inflatable pistons will be a vertical top ironing type with a capacity of 35 tons. According to the following specifications:

1. Room size - 23 × 20 m
2. Bale size - 23 × 20 inches.
3. Bale thickness (T) - depends on the type and quantity of waste
4. Bale weight - adjustable from 25 kg to 60 kg as requirements.
5. Strength - 5 hp
6. Controls - press button works, electrically controlled
7. Production -1-4 tons per 6 hours each meal depends on the weight of bales
8. Capacity -35 tons
9. Connecting the bale - manual by plastic/steel tape

Why is plastic recycling important and what are the challenges facing the industry?

It is possible to answer the question of our research through what has been developed below : Plastic recycling is critical, both as a way to deal with current waste and as a component of the circular economy and waste disposal systems aimed at reducing waste generation and increasing sustainability. There are social, environmental and economic consequences surrounding our current habits of waste generation and disposal, which have become necessary. However, meeting the challenges posed by plastic is not easy, and there is a lack of awareness about the problem of plastic waste. Although potential problems were first developed in the 1960s. More recently, the tide seems to be about this problem as more people look for sustainable options and educate themselves about why plastic recycling is important. Today, as consumers and companies look to recycle more plastics, There is a lack of knowledge about how to do this effectively. This causes problems in the form of pollution, either by mixing non-recyclable plastic with recyclable plastic or by trying to recycle plastic contaminated with things such as adhesives, chemicals and leftovers that further hinder recycling. These problems can send plastics to the landfill instead of recycling them. However, plastic recycling has improved dramatically in recent years and can be divided by the basic steps above. (Gunton,2007)

Explain the steps of plastic recycling

1.Collection and distribution: The first step in mechanical recycling is to collect post-consumption materials from homes, businesses and institutions. This can be done by local government or private companies, or by signing up together and the latter is often a common option for companies. Another option is to move plastic materials to common assembly points such as containers or custom recycling facilities. This may be as simple as a bottle container on a street corner or local waste site with large areas for various recyclable and non-recyclable solid waste.

2. Sorting and classification: The next step in the plastic recycling process is sorting. There are several different types of plastic, which must be separated from each other by recycled. Also, plastic can be sorted by other properties such as color, fish and use. This is done through machinery in the recycling plant and is an important step to increase factory efficiency and avoid contamination of finished products.

3.Washing: Washing is a crucial step in the plastic recycling process because it removes some impurities that can hinder the process. The impurities targeted in this step usually include things like product labels and adhesives as well as dirt and leftovers. While plastic is often washed at

this stage, it is important to remember that this does not detract from the importance of ensuring that plastic is as free of impurities as possible before disposing and collecting it.

4.Chopping: Plastic is then inserted into shredders, which divide it into much smaller pieces. These small pieces, unlike problem plastic products, can be processed in the next stages of reuse. In addition, resized plastic pieces can be used in other applications without continuous processing, such as additives inside asphalt or simply sold as raw material. Fragmentation of plastic into smaller pieces also allows for any remaining impurities. This is particularly true for pollutants such as metal, which may not be removed by washing but can be easily collected by magnets at this stage.

5.Identification and separation of plastics: Here, plastic pieces are tested for their class and quality. First, they are separated on the basis of density, which is tested by floating plastic particles in a bowl with water. This is followed by a test of what is known as the "air classification", which determines the thickness of plastic pieces. This is done by placing the chopped plastic in an air tunnel, with pieces floating while the larger/thick pieces remain at the bottom.

6.Plastic Granules: This final step of plastic recycling is to turn cut plastic particles into a usable product for manufacturers. The chopped plastic is melted and crushed together to form granules. It should be noted that it is not always possible to assemble all types of plastic, classify it and its recipes in one factory, so different degrees of plastic are sometimes sent to other recycling facilities for this final step.

Required employment

The plastic recycling project needs 32 workers with full experience in the field of recycling plastic waste, preferably graduates of technical schools in order to deal with machinery, in addition to the appointment of a public relations and advertising officer, an accounting officer and a secretary, and the entrepreneur is preferred to take charge of managing the factory, doing business and completing transactions.

Marketing for plastic recycling project

Good marketing plays a pivotal role in the success of the project, as there are a number of different means that can be used in this, and the Internet is one of the most prominent, especially social media platforms, by creating a page in the name of the project and advertising the products and services it offers, and the project can be promoted through various media, as well as printing large quantities of advertising cards including the name of the project and various means of communication.

Table 3 Project Cost

Equipment	Total amount	Cost
Project area	75 million dinars	The project area must be at least 5,000 square meters and be out of town, as it is used for manufacturing, production and storage. Worth 7,500,000,000 million dinars
Cost of management	15 million dinars	The cost of management department equipment, which includes offices, computers and the Internet, ranges from 1,500,000,000 million dinars
Power cabin and its branches	11 million dinars	The cost of installing an integrated electrical system inside the factory ranges from 11 million dinars
Fans	15 million dinars	Cost of purchasing and installing ventilation fans and dumps 15 million dinars

building	100,000 million dinars	The cost of processing the construction of the factory is 100,000 million dinars
laundry basin	3,000,000 million dinars	Construction of the laundry basin 3 million dinars
Drying basin	4500,000 million dinars	Construction of drying basin45 million dinars
Plastic miner	18 million dinars	Purchase of a plastic miner 18 million dinars
Plastic injection machine	2,000,000,000 million dinars	The cost of purchasing a plastic injection machine is 2 million dinars
Bumps	1750,000 million dinars	The cost of buying 1750,000 million dinars
Clark	2,000,000 million dinars	The cost of buying Clark is 2 million dinars.
Workers' protective clothing and shoes	15 million dinars	The cost of purchasing clothing and protective shoes for workers is 1,500,000 million dinars
Transport vehicles	75 million dinars	The cost of buying transport cars is 75 million dinars
Cleaners	1,000,000 million dinars	Purchase of other materials, such as detergents, packaging strips and others 1 million dinars
Wages of workers	21million dinars	Wages of workers per month number 32 21 million dinars
	Total	264750000 million

Source: Preparing researchers by interview with specialists

Conclusions

There is no independent mechanism or systems protocols for the management of plastic waste despite the existence of the law. Solid waste management is in an unhappy and crisis state in Najaf province, as is the case across the country after a decade of failed experiments. This is due to a lack of appropriate collection systems and a lack of understanding of environmental responsibility and vested interests. Plastics are scattered in public places, leading to all the negatives described above. The lack of a waste separation at the source or at assembly points is one of the main problems of waste management. Innovative ways to integrate the government sector with the private sector will take us into this business, start working to open waste exchange centers, and work in the supply chain network. To support any recycling initiative, collecting and storing plastic waste will be a problem because of its large size and low density. However, if there is a system in place to separate at the source, the problem can be addressed. Picking up scattered waste is an extra job for which the system must work and be included as a priority. Waste pressure techniques are available for storage and transportation easily and economically without compromising the quality of plastics. The private sector is an important player in waste management, especially recyclable waste such as plastic, paper and glass..... etc., providing livelihoods for thousands of workers in the city. There is a need to integrate this sector with government waste collection systems to ensure effective waste management as described here.

Recommendations

1. Work must be done in accordance with technology developments to demonstrate the use of plastic after consumption to reduce the risk of disposal of plastic waste along with solid waste and the use of PVC waste must be avoided and, if used, must be converted into hydrochloric acid.

2. Environmental awareness is important through public awareness campaigns, good education and in terms of continuous design. People must be made aware of the need to protect and preserve the environment.
3. We must refer and reverse european plastic waste management rules in our country for the purpose of benefiting from them. Central plastic waste management rules such as biomedical waste, solid waste, hazardous industrial waste and electronic waste may be integrated to achieve optimum plastic waste for the plant as part of recycling control.
4. It is also appropriate to note that zero waste concepts can be implemented through a sound national recycling programme, as the ultimate goal determines the methodology and technology to be used.
5. Regulatory frameworks and guidelines for the recycling industry must be developed to integrate them with current waste management rules and guidelines. To develop recycling standards for industry and the sector under the national recycling program.
6. Public-private partnerships should be encouraged to establish waste reuse, recycling and reprocessing facilities from different sectors by providing incentives and ensuring that the process of establishing public-private partnership facilities leads to broad implementation.
7. The recycling industry must be based on the scientific assessment of soil and groundwater pollution and the expected future impact based on expected modelling scenarios.
8. Research and development plays an important role in waste management to identify recycling opportunities and the scientific method of waste management. The government should allocate funds to enhance research and development activities in identifying new waste management and recycling techniques and to expand the range of advanced technologies in the industrial context.
9. The recycling and waste management capacity of local institutional bodies must be built to raise awareness of recycling practices and technical capabilities and waste management techniques.
10. It should be aimed at reducing waste generation in a dual way: developing and implementing strategies for recycling, reuse and final waste disposal in a way that is not harmful to the environment. Promoting biodegradable and recyclable alternatives to non-biodegradable materials.

References

Al Jabouri, A. A. N. The comparative role between commercial and Islamic banks in Iraq: Rafidain Commercial Bank, Tigris Bank and Islamic Euphrates-Case Studies.

Al Jabouri, A. A. N. The comparative role between commercial and Islamic banks in Iraq: Rafidain Commercial Bank. Tigris Bank and Islamic Euphrates-Case Studies.

Al Jabouri, A. A. N., & Al-Yasiri, N. H. (2022). Marketing religious tolerance and its role in peaceful coexistence between religions and its impact on the local economy is an applied study in Iraq. Ishtar Journal of Economics and Business Studies (IJEBS), 3(1), 1-14.

Al Jabouri, A. A. N., & Al-Yasiri, N. H. A. K. (2020). Viral Marketing and its Role in Making a Global Economic Crisis: COVID Virus as a Model.

Al Jabouri, A. A. N., & Kadhum, S. A. (2021). Flying instruments and their impact on the national economy and the extent of their control (CTS guidelines model).

Al-Abedi, T. K., Hasen, A. M., Mohaisen, H. A., & Flayyih, H. H. (2022). The Impact of Corporate Governance on Accounting Conservatism in the Financial Statements of Justice Shareholders: *Central Asia and the Caucasus*, *23*(1), 272-281. https://doi.org/10.37178/ca-c. 23.1. 025

AlJabouri, A. A., & Mohammed, S. J. (2020). The impact of marketing deception in the e-procurement decision/exploratory study of students of the Business Department at the

Faculty of Administration and Economics at Iraqi universities. TANMIYAT AL-RAFIDAIN, 39(128), 129-149.

AlJabouri, A. A., & Mohammed, S. J. (2020). The impact of marketing deception in the e-procurement decision/exploratory study of students of the Business Department at the Faculty of Administration and Economics at Iraqi universities. TANMIYAT AL-RAFIDAIN, 39(128), 129-149.

Al-Jobori, A. A. N. (2019). Social media and its impact on hotel marketing strategy through proactive service (for a sample of tourist hotels in Baghdad). Adab Al-Kufa, 1(39).

Al-Jubouri, A. A. N. (2015). Employ the contracts of advanced financial options to build hedge portfolio-An Empirical Study in the Iraqi banking sector. Journal Of Babylon Center for Humanities Studies, 5(2).

Al-Jubouri, A. A. N. (2020). Museum marketing skills and how to use them to attract international tourists. Journal of El-Maqrizi for Economic and Financial Studies Volume, 4(2), 87-104.

Al-Jubouri, A. A. N. (2020). The formal framework and strategic approach to HRM during the crisis: An applied research in Al-Najaf Al-Ashraf Clothes Factory.

Al-Jubouri, A. A. N. The impact of banking marketing on Iraqi consumer behavior (a sample of Iraqi commercial bank employees).

Al-Jubouri, A. A. N., & Fleifal, A. A. (2020). The Influential Connection between Knowledge Hiding and Workplace Ostracism in Iraq.

Al-Jubouri, A. A. N., & Fleifal, A. A. (2020). The Influential Connection between Knowledge Hiding and Workplace Ostracism in Iraq.

Al-Jubouri, A. A. N., Alabassi, M., & Mohammed, J. (2020). Role of Organizational Accountability in the Reduction of Social Loafing Behavior in the workplace: An Empirical Study in Al-Sadr General Hospital. Int J Psychosoc Rehabil, 24(07), 13.

Al-Jubouri, A. A. N., Alabassi, M., & Mohammed, J. (2020). Role of Organizational Accountability in the Reduction of Social Loafing Behavior in the workplace: An Empirical Study in Al-Sadr General Hospital. Int J Psychosoc Rehabil, 24(07), 13.

Al-Jubouri, A. A., & Collage, B. I. Ethical marketing and its role in achieving cyber security for Zain Iraq Telecom employees through self-disclosure.

Alkhafaji, A., Talab, H. R., Flayyih, H. H., & Hussein, N. A. (2018). The Impact of Management Control Systems (MCS) on Organizations Performance a Literature Review. *Journal of Economics and Administrative Sciences*, *105*(24), 116.

Aruna Shantha,(2019), Project Proposal for Post-Consumer Plastic Recycling Project, See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/330488613.

Damghani AM, Savarypour G, Zand E, Deihimfard R (2008) Municipal solid waste management in Tehran: current practices, opportunities and challenges. Waste Manag 28:929–934. https://doi. org/10.1016/j.wasman.2007.06.010

Grigore Madeline Elena,(2017), Methods of Recycling, Properties and Applications of Recycled Thermoplastic Polymers, Recycling 2017, 2, 24; doi:10.3390/recycling2040024 www.mdpi.com/journal/recycling.

Gunton, H. B. & Williams, I. D. 2007. Waste minimisation using behavioural change techniques: a case study for students. In: LECHNER, P. (ed.) Waste Matters: Integrating Issues. Proceedings of 2nd BOKU Waste Conference. Vienna.

Hakim Mohsen Al-Rubaie, & Ali Abboudi Nehme Al-Jubouri. (2019). The role of media marketing in attracting international tourists through the theory of social penetration (Analytical study of a sample of Iraqi tourist hotels. magazine of college Administration&Economics for economic &administration & financial studies, 11(4).

JAGTAP,p ,(2021), A Pre-Assessment related to Refractory Waste Management in Sweden, DEGREE PROJECT IN MATERIALS SCIENCE AND ENGINEERING, SECOND CYCLE, 30 CREDITS STOCKHOLM, SWEDEN 2021.

Jamshidi A, Taghizadeh F, Ata D (2011) Sustainable municipal solid waste management (Case study: Sarab County, Iran). Ann Environ Sci 5:55–59

Miezah K, Obiri-Danso K, Kádár Z, Fei-Bafoe B, Mensah MY (2015) Municipal solid waste characterization and quantifcation as a measure towards efective waste management in Ghana. Waste Manag 46:15–27. https://doi.org/10.1016/j.wasman.2015.09.009

Mohammeda, S. J., Al-Jubourib, A. A., & Abdulhasan, I. (2020). Toxic and Bullying Behaviour in the Workplace: The Relationship and Impact.

Monali Parida ,Victor Pradhan ,Preetha Bhadra , Bishwambhar Mishra,(2016), A NOBLE PROCESS OF PRODUCTION OF BIO PLASTIC (DEGRADABLE) FROM WASTE PLASTIC (NON- DEGRADABLE), September 2018, Volume 5, Issue 9 www.jetir.org (ISSN-2349-5162)

Mreza, M. D., Bachay, I. R., & Flayyih, H. H. (2018). The Role Higher Education Quality in Achieving Sustainable development: Field Study from the perspective of Iraqi Universities Instructors. In *The annual second conference*.

Na Zhang,(2011), Greening Academia: Developing Sustainable Waste Management at UK Higher Educational Institutions, Thesis for the degree of Doctor of Philosophy, FACULTY OF ENGINEERING, SCIENCE AND MATHEMATICS School of Civil Engineering and the Environment.

Pakpour, A. H., Zeidi, I. M., Emamjomeh, M. M., Asefzadeh, S., & Pearson, H. (2014). Household waste behaviours among a community sample in Iran: An application of the theory of planned behaviour. Waste management, 34(6), 980-986.

Parid A, Singh A, Unnnikrishnan S, Naik N, Naik M, Nimkar I (2018) Innovation in solid waste management through clean development mechanism in India and other countries. Process Saf Environ Prot 101:160–169

Ragaert, K., Delva, L., & Van Geem, K. (2017). Mechanical and chemical recycling of solid plastic waste. Waste management, 69, 24-58.

Saliha, J. I., & Flayyihb, H. H. (2020). Impact of audit quality in reducing external audit profession risks. *International Journal of Innovation, Creativity and Change*, *13*(7), 176-197.