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ACHIEVING THE SUSTAINABILITY WASTE MANAGEMENT STRATEGIES DEPENDING ON RECYCLING INDUSTRY BY USING (ISO 14001: 2015)\ A CASE STUDY IN THE FACTORY OF RECYCLING AND PROCESSING WASTE IN AL-MAHMOUDIYAH-BAGHDAD.

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Dr. Raghad Yousif Gabrow , Achieving The Sustainability Waste Management Strategies Depending On Recycling Industry By Using (Iso 14001: 2015)\ A Case Study In The Factory Of Recycling And Processing Waste In Al-Mahmoudiyah-Baghdad. , Palarch's Journal Of Archaeology Of Egypt/Egyptology 18(2), 1022-1052. ISSN 1567-214x.

Keywords: *Sustainability of waste management, *Recycling Industry *ISO 14001: 2015

Abstract: -

In our world where is increasingly important to be environmentally responsible, it is important that we take note. West management is committed to continual improvement and sustainable business practices, that focuses on developing the people and look to the waste management as a core function of developing the waste treatment processes.

1- Introduction

This study introduced the new demand for sustainability waste management which requires a new path. Therefore the researcher studied the (3Rs) in which the first one stands for reduce, the second (R) for reuse and the other (R) for recycle. The practical section used a checklist

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of (ISO 14001: 2015) to measure the gap size in applicating the recycling in AL-Mahmoudiyah factory for recycling and processing waste.
The results of measuring the gap size was 100% the gap because the factory did not use the ISO standards for recycling industry.

2- The methodology of the study

A- Importance of the study

The study identifies the gap related to the problems which reflect the defects because of not applicating the (ISO) standards especially (ISO 14001: 2015) in the AL-Mahmoadiyah factory.

B- Objectives of the study

~~The main objectives of the study are to~~ explain the life cycle o
recycle industry to develop and implement a comprehensive (3Rs) initiative based on waste management systems.

C- The Research problem

The main problem were the factory did not applicate the (ISO 14001: 2015) in the recycle industry.

3- Literature Review

3-1: What is waste management?

Waste management involves collecting, transporting, processing, recycling and disposing waste materials, in an effort to reduce their adverse effects on human health and the environment. (www.smibusinessdirectory.com,2020, p: 1)

The Long-recognized hierarchy of management of wastes, in order of preference consists of * Prevention, *minimization, *recycling and *reuse, biological treatment, incineration, and landfill disposal. (Bhatia,2010, p: 215)

Therefore the circular economy is about a rethinking of the operating system itself. The take-make-dispose process is systematic, and is deeply ingrained in society. (Kasper,2020, p: 4)

So communities across the country are facing mounting solid waste disposal problems. Existing landfills are quickly being filled to capacity and finding and opening new ones are becoming increasingly more difficult and expensive. (www.blog.chefuniforms.com,2020, p: 1)

The companies manage waste in accordance with a waste management through the aim to prevent or reduce waste generation.

3-1-1: - Waste Management Hierarchy

Most communities and companies aim to reuse, recycle or treat waste prior to disposal. One of the ultimate goals of companies termed: "Goals fields mine of the future", is to seek to significantly reduce the mining waste generated by the company's business.

Figure (1) shows the hierarchy of management of wastes in order or preference, starting with prevention as the most favorable to disposal as the least favorable option. (Bhatia,2010, p: 215)

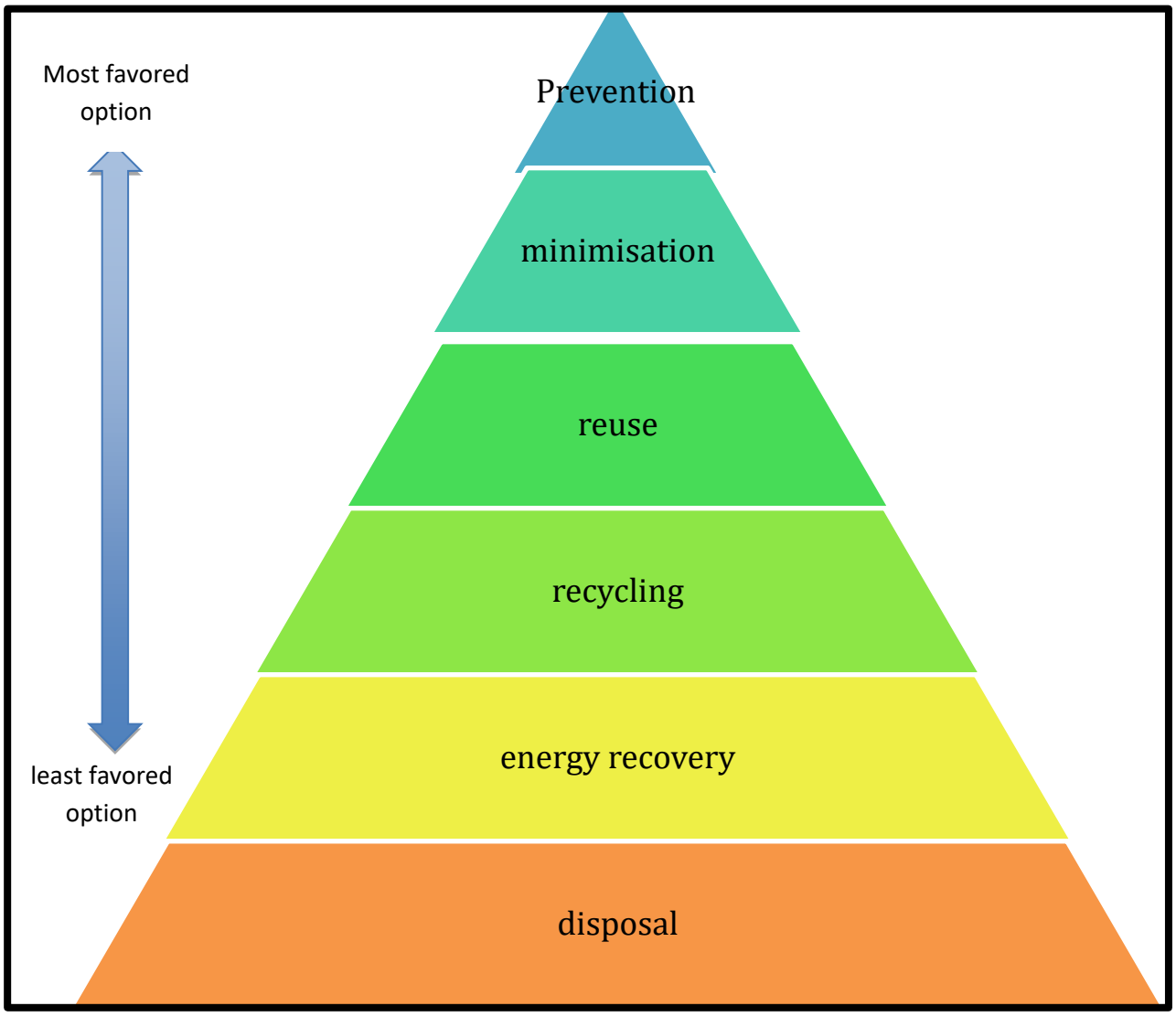


Figure (1) The hierarchy of waste management

Source: (goldfields@tip-offs.com,2020, p: 1)

3-1-2: Waste Management Strategies

Most recyclable packing has a triangle design, which indicates that it is recyclable. The best way to minimize the impact of waste is to not use it in the first place. There are three term (reduce, reuse, recycle) which is clearly gives a nod to circular resource use. Each term refers to a slightly different way to manage waste, which called the 3Rs of waste management, as shown in figure (2).

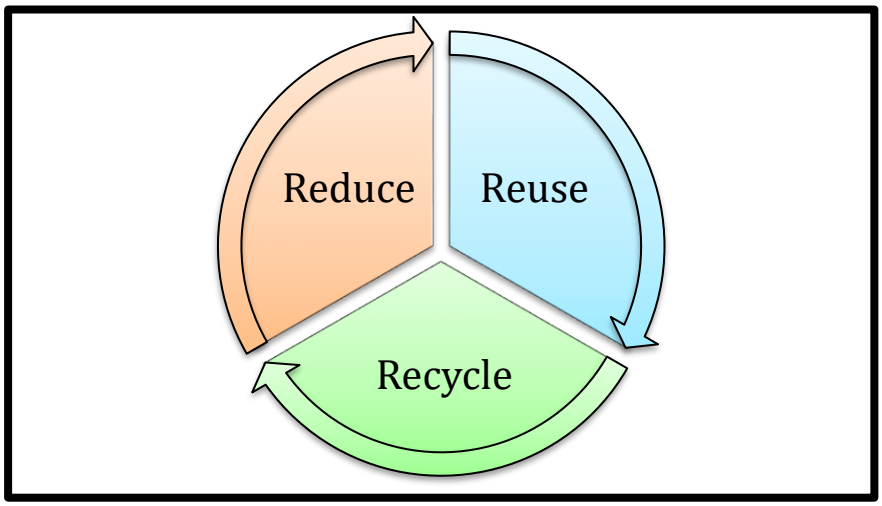


Figure (2) The 3 Rs of waste management

Source: Kasper, Dan, 2020, "waste management strategies", p: 1.

The implementation of waste management requires careful planning and adequate financial resources and is the responsibility of all parties involved such:

* individuals * Businesses and * corporations.
(www.smibusinessdirectory.com,2020, p: 1)

The expenses are ultimately passed on to residents and businesses.

Figure (3) shows the comprehensive waste management strategies.

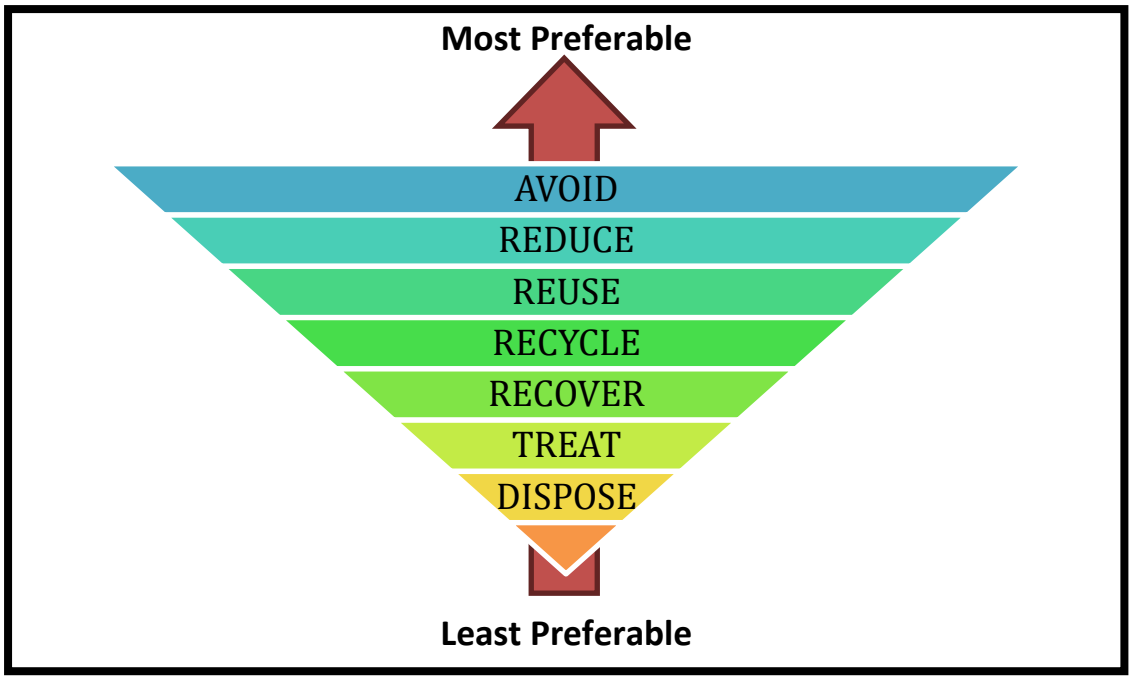


Figure (3) The comprehensive waste management strategies

Source: (www.blog.chefuniforms.com,2020, p: 2)
By ensuring a reduction in the waste that reaches landfill through greater use of onsite waste separation and recycling (www.goldfields@tip-offs.com,2020, p: 2-3)

Despite concerted efforts to promote reuse, reduction and recycling (3Rs) of materials through the companies, the amount of solid waste recycle remained at less 5.0% of total waste disposed. (www.Smibusinessdirectory.com,2020, p: 3)

Cradle to Cradle product standard

It's a term related to the circular economy called (Cradle to Cradle Design).
The Abbreviation term (C2C) means a concept reflect an application of the circular economy. This concept is summed up as following:

- Keeping all materials in continuous cycles.
- Stimulating the use of renewable energy only.
- And celebrating diversity.

That will resulted the following:

- Less bad, 100% good.
- An efficient pursuit of the wrong goals.
- Waste = Food.

Therefore (C2C) certified product standard guides designers and manufacturers through a continual improvement process that looks at a product through five quality categories:

1. Material health.
2. Material reutilization.
3. Renewable energy and carbon management.
4. Water stewardship.
5. Social fairness. (Kasper,2020, p: 4-5)

3-1-3: - The three strategies of waste management

(A.L.–Bhatia) in his book titled "Environmental Biology" explained three strategies for waste management as following:

First strategy: - waste prevention

This strategy related to prevent waste generation in the first place. Therefore, waste prevention is a basic goal of all the waste management strategies.

Some representative strategies include environmentally conscious manufacturing methods that incorporate less hazardous or harmful materials.

Second strategy: -waste minimization
Wastes cannot be outright eliminated from a variety of processes, therefore numerous strategies can be implemented to reduce or minimize waste generation.
Waste minimization, or source reduction, refers to the collective strategies of design and fabrication of products or services that minimize the amount of generated waste and\ or reduce the toxicity of the resultant waste.

Many benefits can be realized by waste minimization or source reduction, including reduced used of natural resources and reduction of toxicity of waste.

Third strategy: - Recycling and Reuse

Recycling refers to recovery of useful materials such as glass, paper, plastic, wood, and metals from waste stream so they may be incorporated into the fabrication of new products.
Recycling of wastes directly conserves natural resources, reduces energy consumption and emissions generated by extraction of virgin materials and their subsequent manufacture into finished products, reduces overall energy consumption and greenhouse gas emissions that contribute to the goal climate change.

Fourth strategy: - Biological Treatment

Landfill disposal of wastes containing significant organic fractions is increasingly discouraged in many countries.

Fifth strategy: -Landfill Disposal

Despite advanced in reuse and recycling, landfill disposal remains the primary waste disposal method.

There are new regulations concerning proper waste disposal and the use of innovative liner system to minimize the potential of groundwater contamination, that will resulting landfill continues to grow, partially inspired by memories of historic uncontrolled dumping practices. (Bhatia,2010, p: 324-330)

3-2: sustainability waste management

3-2-1: - The concept of sustainability
Sustainability is a word that increasingly come across in all aspects of life which related of the depletion of natural resources in order to maintain an ecological balance. (www.cleanstreets.westuminster.gov.uk,2021, p: 1)
The concept of sustainability relates to (waste), is relatively straightforward. By following the waste hierarchy to eliminate waste from being sent to landfills. (Waste) should be managed to prevent it in the first place. Figure (4) explains the sustainability concept of waste management.

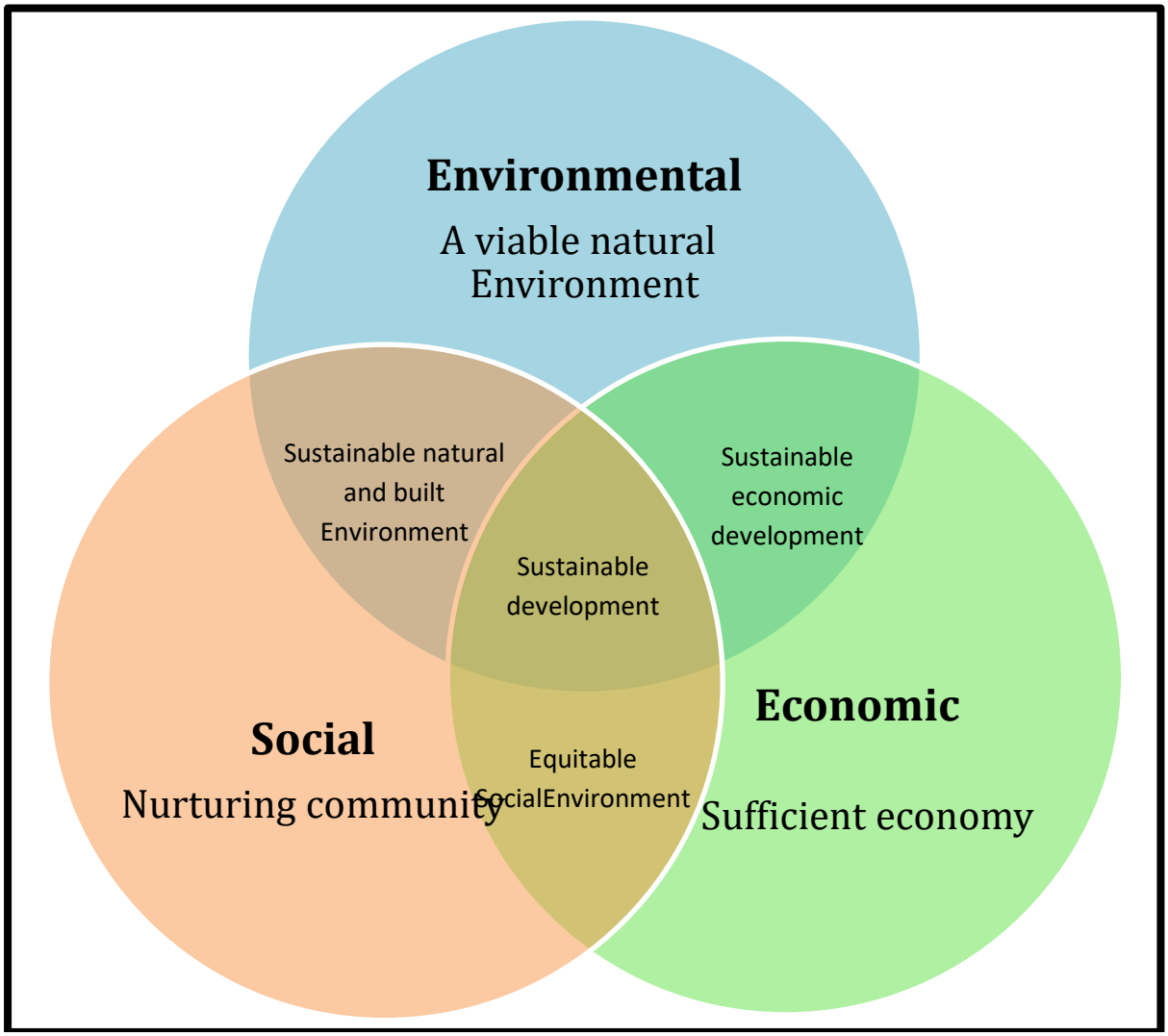


Figure (4) The concept of sustainability waste management

Source: www.asiwaste.com,2021, "sustainability waste management", p: 1.

Looking to (green) the business, it's the time to go beyond recycling. Therefore sustainable waste management gives the company an opportunity to improve it's business, eco-friendliness, reduce greenhouse gas emissions and even lower operation costs. (keenan,2018, p: 1)

3-2-2: - The waste hierarchy

The company must design and manage various waste related programs, and evaluate the potential reuse of the items being discarded, so the evaluating must relates to options utilizing the waste hierarchy.

The (waste hierarchy) demonstrates the disposal option. The company must looking for a market for a waste stream to be reused or recycled, therefore there is a need for three key elements to be successful: -

*manageable volume *processing facility *end user.

Figure (5) clarifies the (waste hierarchy).

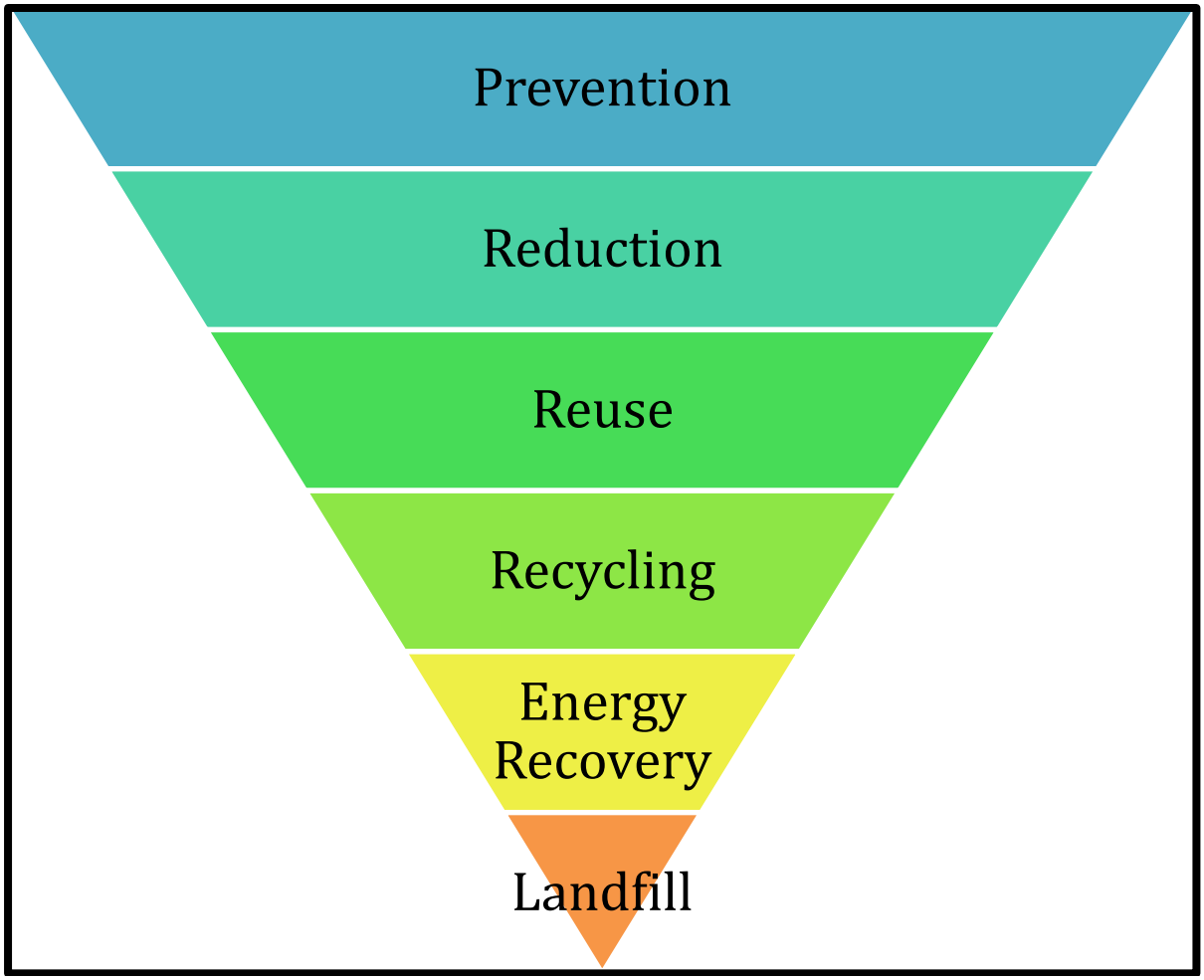


Figure (5) The waste hierarchy

Source: www.asiwaste.com,2020, "sustainable waste management", p:2.

But (www.whatplastic.com,2021, p: 2-4) explained the various different versions of the waste hierarchy which opted for a (6-Level pyramid) to keep things simple.
Figure (6) clarifies this pyramid.

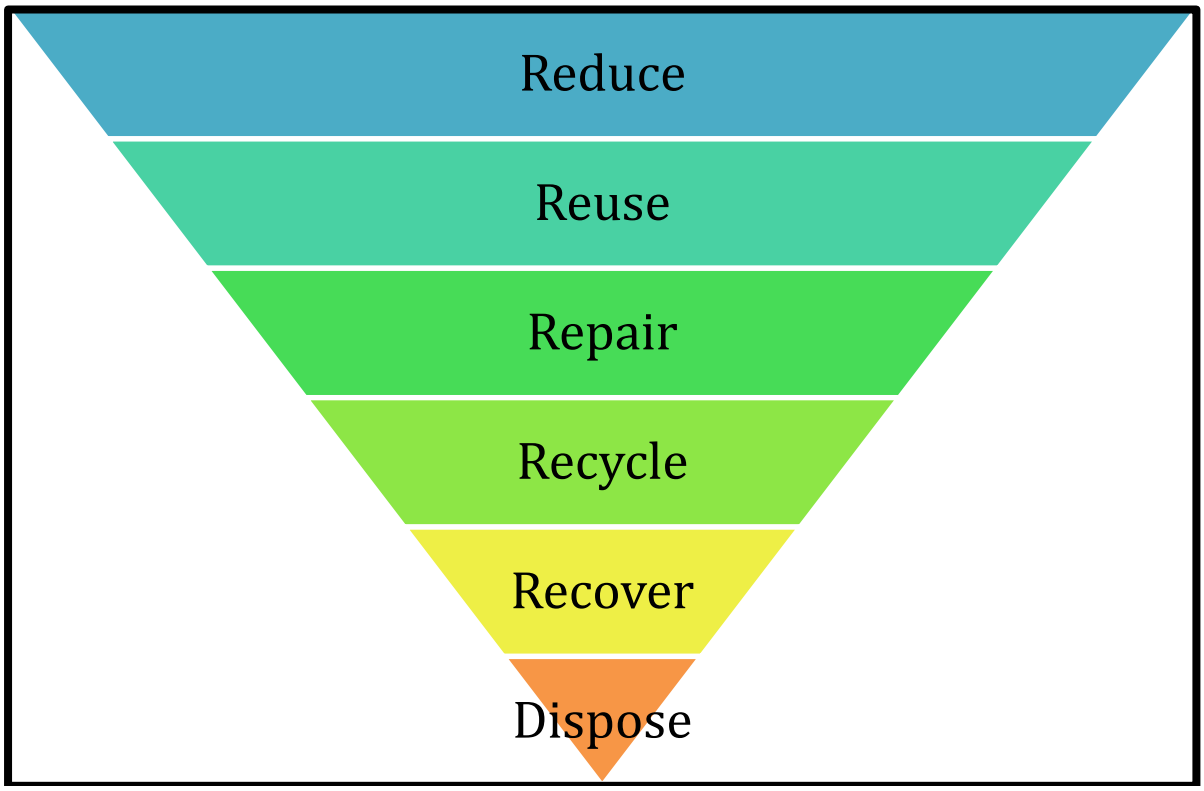


Figure (6) The pyramid of waste hierarchy

Source: www.whatplastic,2021, "the waste hierarchy", p: 4.

3-2-3: the (7Rs) of sustainability

The common (Rs) of sustainability are:

*reducing *reusing and recycling, it's a popular topic around earth day. (Paxton,2018, p: 1)

But (kasper,2020, p:1) defined the (3Rs) as following:

The first R*(Reduce): refers to not creating the item\material in the first place. (don't buy or use the plastic bottle in the first place).
So (zeqiri et al,2019, p: 1) stressed on the mining products, related on their impact to economic growth, as well as mining impact into environment: the key principles of mineral waste are (reduction-reuse-recycling). That needs empowering employees to practice sustainable principles on a daily basic through adequate education and training. (www.chemwaste.com,2021, p: 1)

The second R*(Reuse): the next step of waste management hierarchy involves the reuse of both products and materials. The conservation and repair of complex products, such as electronic and mechanical devices, both at home and in the workplace. (www.info@rts.com,2021, p: 3)
The reuse related to mandatory provisions of used oil deposit\collection facilities by all vendors of lubricants to target used oil produced by different users. (Srinivas,2015, p: 1)

Reuse involves secondary uses of waste materials either in part or whole. Reuse of waste is exemplified by trade in second-hand goods: clothes, electronics, automobiles, furniture and other merchandise. (peprah et al,2015, p: 3)

The third R*(Recycling): is the process to change items considered as waste into new products to prevent waste of potentially useful materials and reduce the consumption of fresh raw materials.
(www.theupcyclingfashionista.woedpress.com,2013, p: 1)
But (Bahraini,2019, p: 4-5) added that the most of the production of waste should be reduced from beginning no longer be avoided, the upcycling process or making it used again, the waste is recycled.

Figure (7) defined the 3Rs cycle.

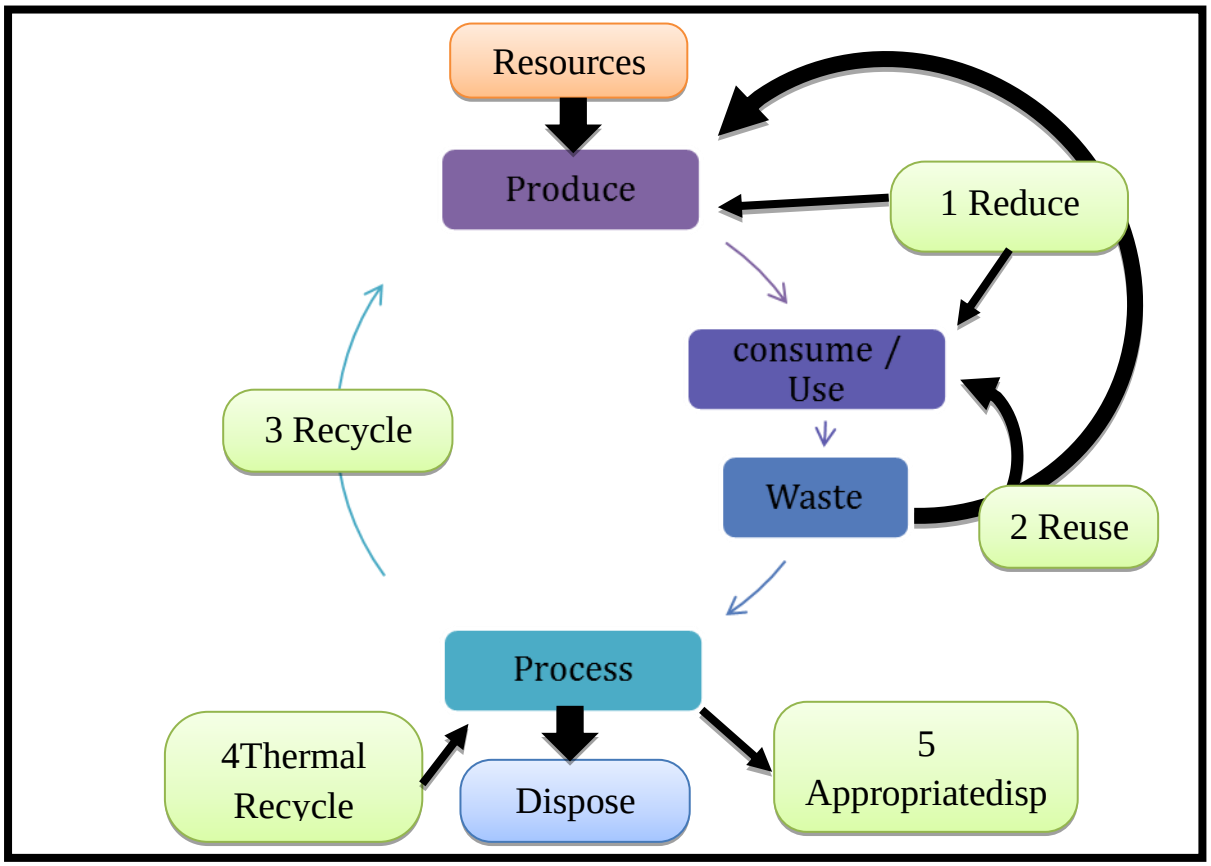


Figure (7) The 3Rs cycle

Source: ohara,Mirei, "Growing opportunities in environmental business", 2010, p: 1.

Recycling is the process of management a product to be sold as new. Along with basic of paper, plastic, glass, and cardboard. (www.heritage-enviro.com,2021, p: 3).
(ohara,2010, p: 1) added that (Recycle) is broadly divided into two methods:

1- Material recycling that uses waste as raw materials for products.
2- Thermal recycling that collects thermal energy during incineration for reuse. As show in figure (7).

*** The meaning of recycling logo: -**

The symbol of nature protection relates to the recycle logo which created by a 23 year-old.

A- History:

Environmental concerns were on the rise in 1970, in Chicago-based producer of recycled paperboard, held a logo design contest. The recycling symbol consists of three twisted arrows forming a triangle shape so-called twisted mobius band. It has a black outline and green fill. (www.1000logos.net,2021, p: 1-6) As shown in figure (8).

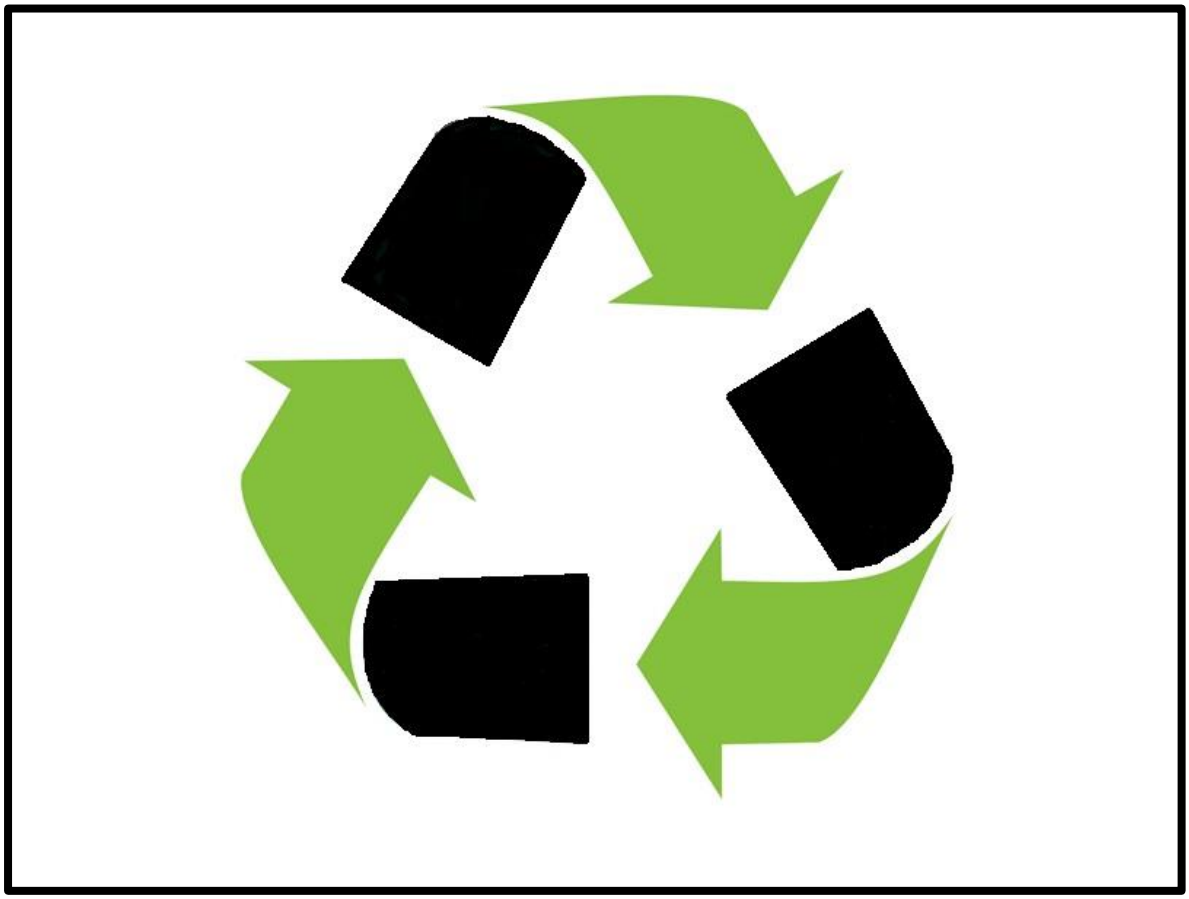


Figure (8) The logo of Recycle

Source: www.1000logoes.net,2021, p: 6.

B- Types

There are many types of logos related to the recycle logo as following:

* the green dot* glass recycling * aluminum and steel recycling.

As show in figure (9).

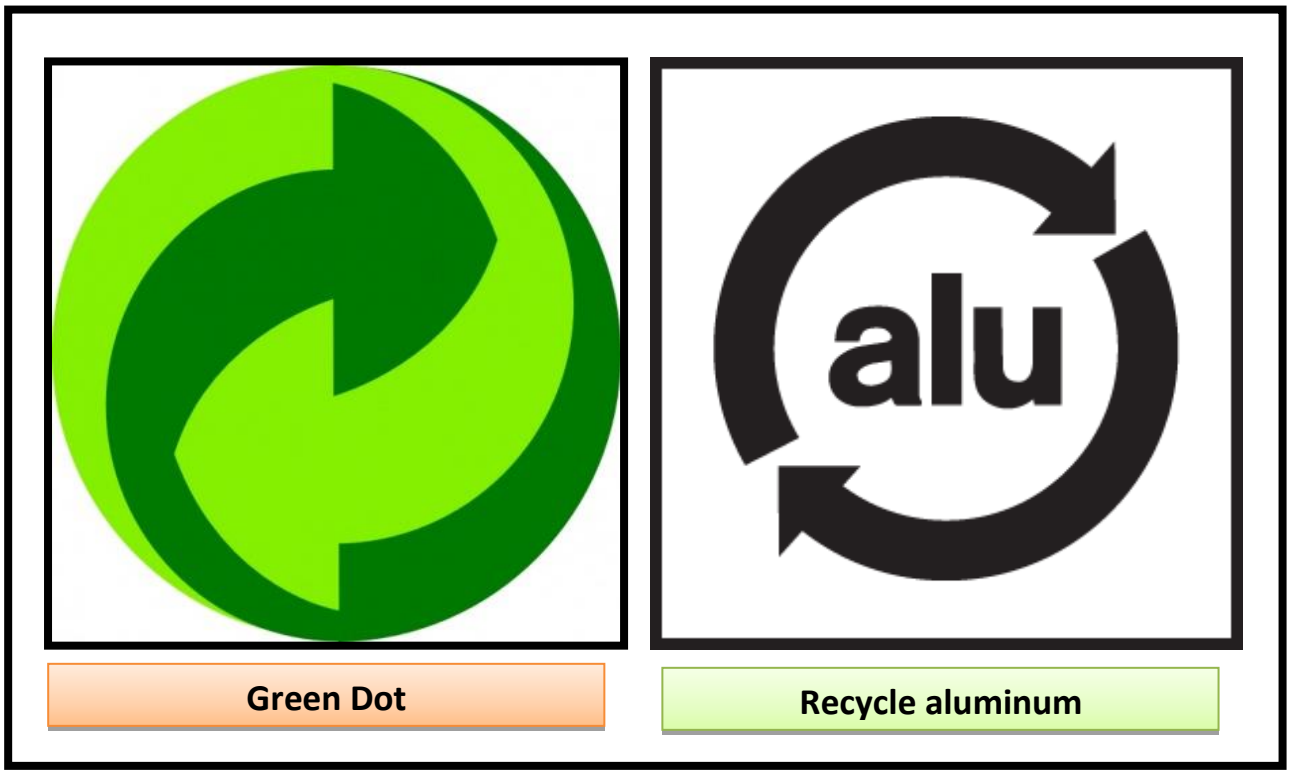


Figure (9) Types of Recycle Logos

Source: www.coda-plastics.co.uk,2016, p: 2-3)

C- How to start a Recycling Business

Recycling business has too many opportunities, (waste recycling business) can be of different types like plastic recycling business, paper recycling business, water battle recycling business etc. there are some steps which the company should follow to make it's own business successful:

1- The company must choose the niche.
2- The company should do the market research before starting recycling business.
3- After doing market research the company should choose the business structure.
4- So there must be have a plan of finance.
5- Register business name.
6- Licenses and permits. (www.yupstory.com,2018, p: 2)

Therefore (Taddanio,2020, p: 2) explained that, the industry promoted recycling heavily counting on a simple strategy:

" If the public thinks the recycling is working, then they're not going to be as concerned about the environment".

The economic benefits of recycling are contentious, it's cheaper and skeptics, because a big portion of the costs of recycling are related to labor- such as transport and processing. (www.kemira.com,2019, p: 2-3). Thus the three R's of the environment (Reduce, Reuse,

Recycle) were introduced as a very important aspect in waste management. (serratos,2020, p: 1)

Much of the difficulty inherent in recycling comes from the fact that most products are not designed with recycling in mind. The concept of (sustainable design) aims to solve this problem. (www.wikipedia.org.,2021, p: 15)

D- Recycling vs. upcycling: -

The concept of Recycling revolves around the (3Rs) – But focusing on the recycling part, is important to understand it's comprehensiveness.
(www.thedeshbandhuexpress.com,2019, p: 1)

The Recycling: is a process of converting waste materials into new materials and objects. The recyclability of a material depends on its ability to reacquire the properties. (www.wikipedia,2021, p: 1)

Upcycling: is a process that can be repeated in perpetuity of returning materials back to a pliable, usable from with out degradation to their latent value-moving resources back up the supply chain. (www.intercongreen.com,2010, p: 3)

As a result, types of waste management are usually split into (3Rs) relates to waste management hierarchy. (www.info@rts.com,2021, p: 2)

E- Quality of recycling

The quality of recirculates is recognized as one of the principal challenges that needs to be addressed for the success of a long-term vision of green economy and achieving zero waste. Recylate quality is generally referring to how much of the raw material is made up of target material compared to the amount of non-target material and other non-recyclable material. (www.wikipedia,2021, p: 6). Thus, recycling aims to environment sustainability there are some (ISO) standards related to recycling such as (ISO 15270: 2008) for plastics waste and (ISO 14001: 2015) for environmental management control of recycling practice. (www.wikipedia,2021, p: 1).

The forth R (Recover):

Recover is the extraction of materials or energy from waste for future use or processing, including, but, not limited to making materials into compost. (www.cleanstreets.westminster.gov.uk,2021, p: 8)

(Ann Paxton) added to the (4Rs) of sustainability a new frame to understand the types of new (Rs) of sustainability. They are:

1- Rethink. 2- Refuse. 3- Reduce. 4- Reuse. 5- Repurpose.
6- Recycle. 7- Rot, As shown in figure (10).

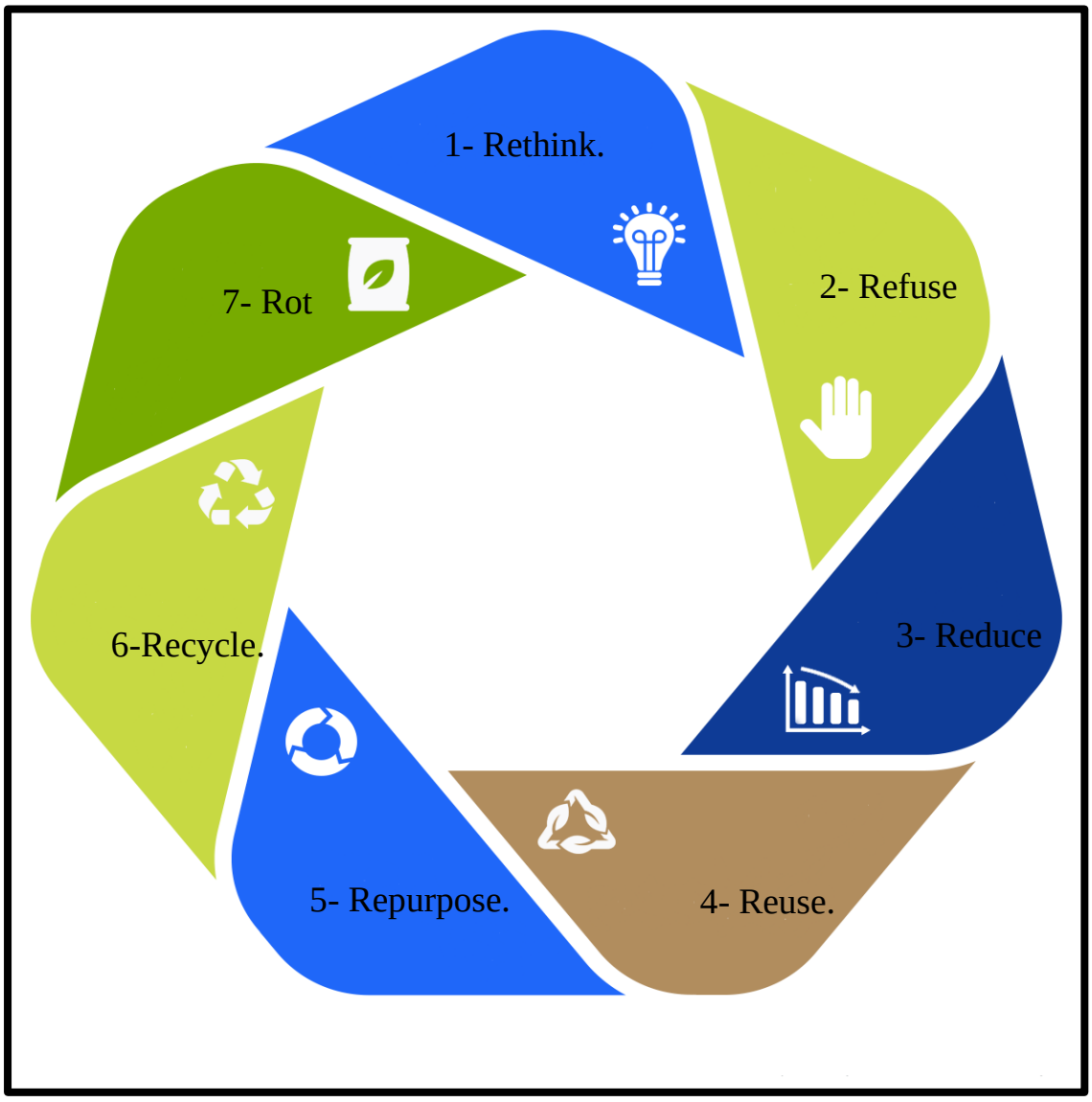
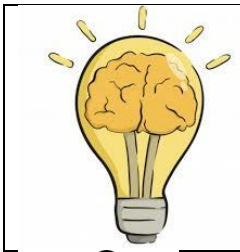
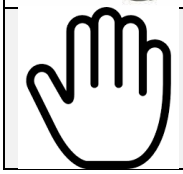
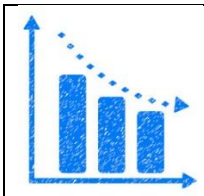
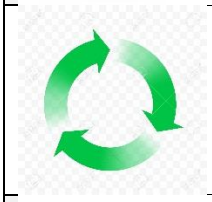


Figure (10) The (7Rs) of sustainability

Source: Ann, Paxton, "The 7Rs of sustainability", 2018, p: 1.
Table (1) explained the statements of (7Rs) of sustainability.

Table (1) The (7Rs) of sustainability

	01 RETHINK • Stop and think: do we really need that box of individually wrapped snacks? • Talk to companies that supply our favorite products about rethinking their packaging
	02 REFUSE • Refuse single-use plastics • Refuse non-recyclable packaging

	03 REDUCE • Reduce consumption • Become conscious of our choices and question whether or not we really need something
	04 REPURPOSE • Transform stuff we'd normally throw away into something cool and useful • Repurpose packaging into arts and crafts
	05 REUSE • Be creative • How can we reuse packaging such as glass, cardboard and some plastics for other uses?
	06 RECYCLE • Use city curbside pickup or find drop-off locations • Ask about recycling options at work • Place a recycling container in our car
	07 ROT • Transform organic waste (food scraps + yard clippings) into nutrient rich sell amendment • Start composting simply + cleanly with the aromatic

Source: Paxton, "the 7Rs of sustainability", 2018, p: 4.

Figure (11) explained what should be the priority for countries.

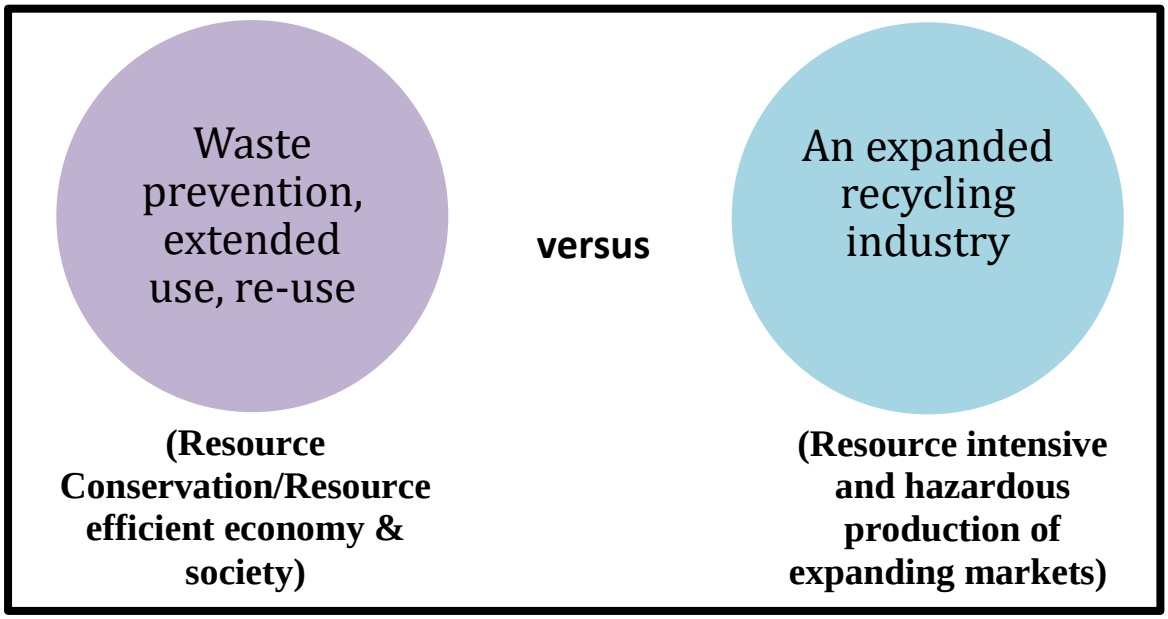


Figure (11) The priority for countries to applicate the (3Rs)

Source: Mohanty, "the (3Rs) and Resource Efficiency as a basic for sustainable waste management", 2011, p: 25.

3-3: What is (ISO 14001: 2015)

(ISO 14001: 2015) is a standard, defines the principles to the organization in order to reach aimed outputs obtained for their management system.
This standard is a new high level structure, which based on (Annex Sl enabling all management systems to meet at the common framework).
So (ISO 14001: 2015) related to the environment management system as a tool in order to establish appropriate and sufficient policy and procedure ensure the environmental management system requirements are corresponded and obtain continuous environmental performance. (www.szutest.com,2019, p: 1)
(ISO 14001) is the international standard that specifies requirements for an effective environmental management system (EMS), It provides a framework that an organization can follow, rather than establishing environmental performance requirements.

3-3-1: topics of (ISO 14001: 2015)

(ISO 14001: 2015) Cover the following topics with regards to environmental management systems:

- Context of the organization.
- Leadership.
- Planning.
- Support.
- Operation.
- Performance.
- Improvement.

As shown in figure (12).

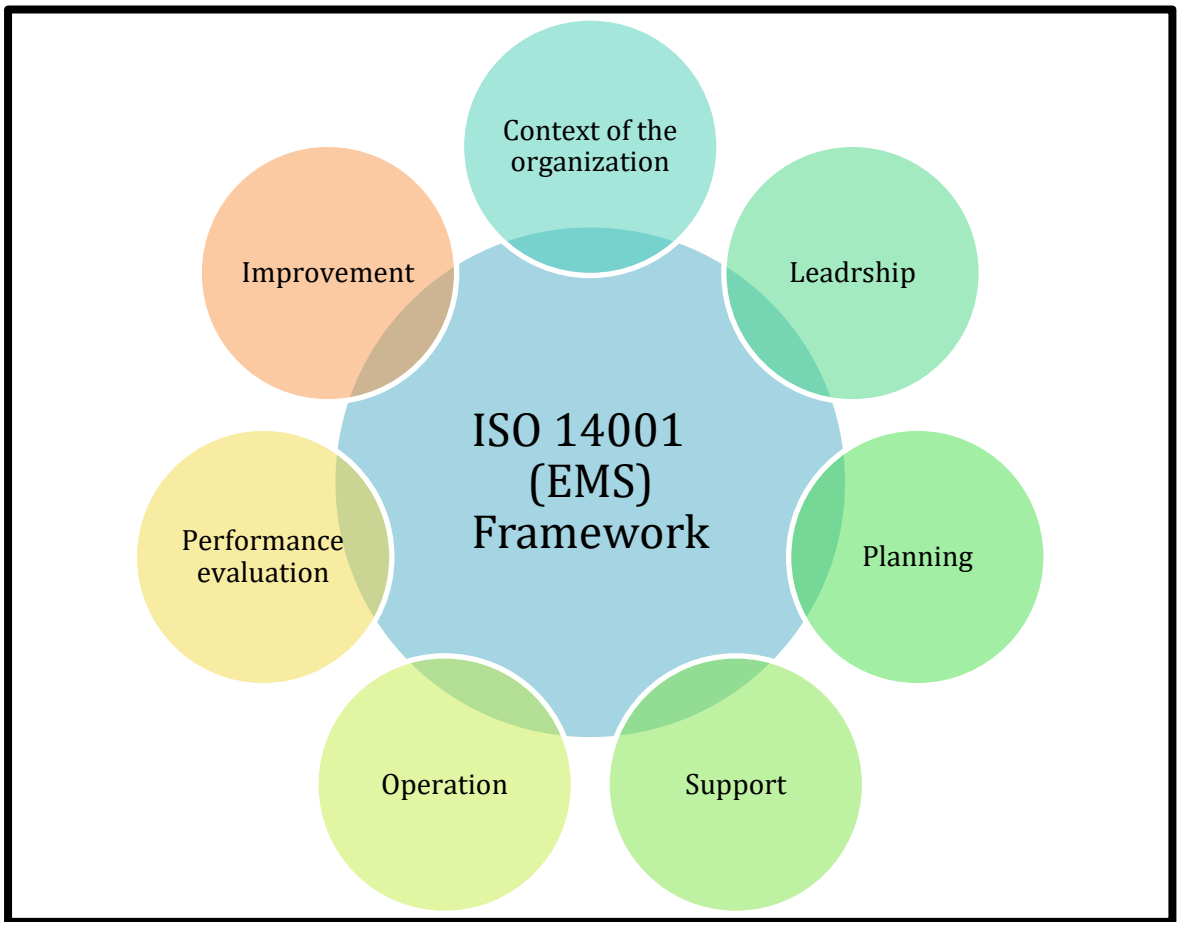


Figure (12) ISO 14001 Environmental Management Systems (EMS) Framework

Source: www.asq.org,2021, p: 4.

4- The practical section

This study concerns with waste management, which applied in AL-Mahmoudiyah factory for recycling and processing waste.

The researcher used the checklist of (ISO 14001: 2015) standard, the statements of the checklist used for measure the possibility of applicating the ISO standard in AL-Mahmoudiyah factory.

4-1: Analyzing the checklist statements

Table (2) Checklist of context\ statement (4)

4.Context	1Completely applied & Completely documented	2Completely applied & partially documented	3Completely applied & not documented	4Partially applied & completely documented	5Partially applied & partially documented	6Partially applied & not documented	7Unapplied & not documented
4.1 Understand your organization and its particular context							
- Identify and understand your organization's external context.							*
- Identify the external issues that are relevant to your organization's purpose.							*
- Identify the external conditions that are relevant to your organization's purpose.							*
- Identify and understand your organization's internal context.							*
- Identify the internal issues that are relevant to your organization's purpose.							*
- Identify the internal conditions that are relevant to your organization's purpose.							*
4.2 Clarify the needs and expectations of your interested parties	1	2	3	4	5	6	7
- Identify the interested parties that are relevant to your organization's EMS.							*
- Identify those who are interested in your environmental performance.							*
- Determine the needs and expectations of your organization's interested parties.							*
- Determine those that are relevant to your environmental performance.							*
- Determine those that have become complianceobligations (requirements).							*
4.3 Define the scope of your environmental management system	1	2	3	4	5	6	7
- Clarify boundaries and think about what your EMS should apply to.							*
- Use boundary and applicability information to define the scope of your EMS.							*
- Consider your compliance obligations when you define your scope.							*
- Consider your corporate context when you define your scope.							*
- Define the scope of your environmental management system (EMS).							*

- Include all the products that fall within the scope (boundary) of your EMS.							*
Weights	0	1	2	3	4	5	6
Frequency	17	0	0	0	0	0	0
Weights * Duplicates	0	0	0	0	0	0	0
The weighted mean	Zero						
Percentage to match	0%						
The size of the gap	100%						

The researcher analyzed the results of table (2) finding that the gap size was 100% versus the percentage match was 0% because that the statement of checklist related to ISO 14001\ statement (4)\ context was unapplied & not documented in the factory.

Figure (13) explained the percentage of the checklist items, statement (4) context.

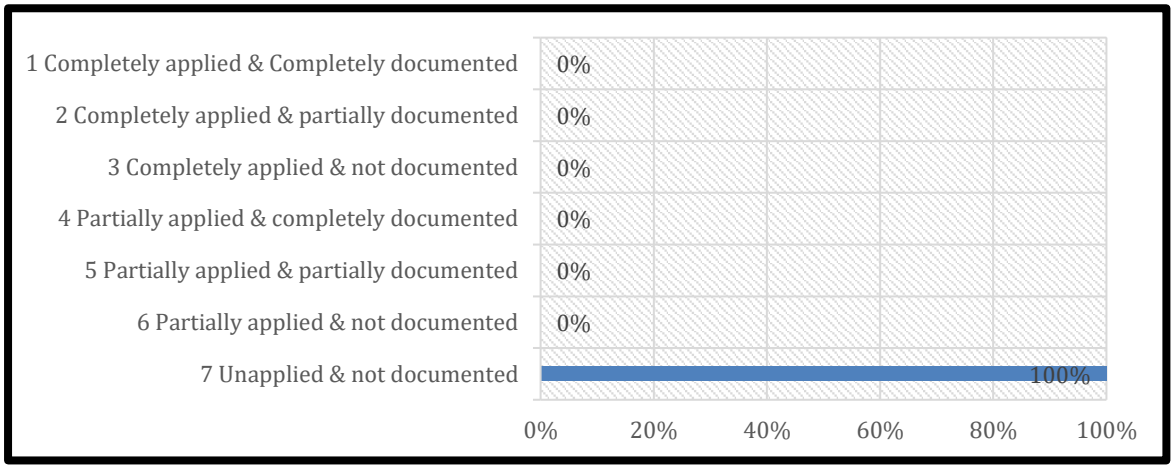


Figure (13) The percentage of (context) statement

Figure (13) stated that the statement (unapplied & not documented) attained the highest percentage in the checklist of (context) 100%, but the other items reached to 0%.
Table (3) clarified the second statement of ISO checklist (14001: 2015) which explained the (Leadership) item (5).

Table (3) Checklist of leadership\ statement (5)

5.Leadership							
5.1 Provide leadership by accepting responsibility for the EMS	1Completely applied & Completely documented	2Completely applied & partially documented	3Completely applied & not documented	4Partially applied & completely documented	5Partially applied & partially documented	6Partially applied & not documented	7Unapplied & not documented
- Accept responsibility for your organization's EMS.							*

- Demonstrate that you are committed to your EMS.							*
- Ensure that an environmental policy is formulated.							*
- Ensure that environment objective are established.							*
- Communicate your commitment to the EMS.							*
- Explain why environment management is important.							*
- Expect your managers to be accountable for their EMS.							*
- Encourage your personnel to personally support their EMS.							*
5.2 Provide leadership by establishing an environment policy	1	2	3	4	5	6	7
- Formulate your organization's environmental policy.							*
- Consider your context when you formulate your organization's policy.							*
- Consider the environment when you formulate your organization's policy.							*
- Consider your compliance obligations when you formulate your policy.							*
- Implement your organization's environmental policy.							*
- Document your organization's environmental policy.							*
- Communicate our organization's environmental policy.							*
- Expect your personnel to comply with your environmental policy.							*
Weights	0	1	2	3	4	5	6
Frequency	16	0	0	0	0	0	0
Weights * Duplicates	0	0	0	0	0	0	0
The weighted mean	Zero						
Percentage to match	0%						
The size of the gap	100%						

The results of table (3) were that the gap size was (100%) versus (0%) of the percentage match, that's why the unapplied of the conditions of checklist related to check the leadership items.

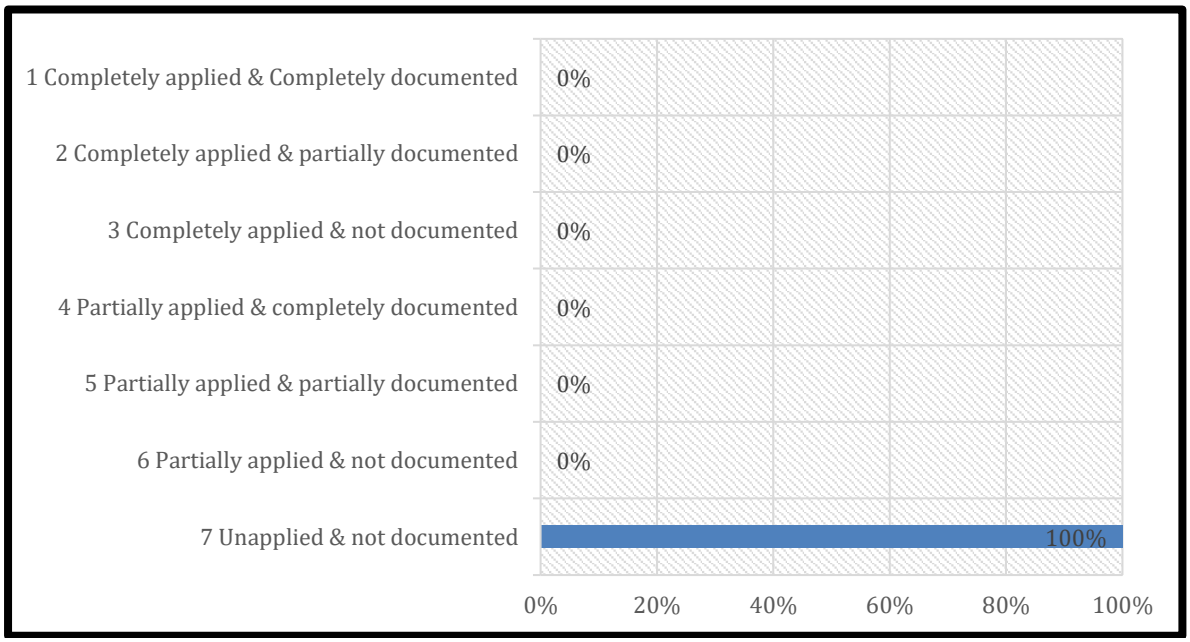


Figure (14) The percentage match of leadership checklist

Figure (14) stressed on the statement related to unapplied & not documented which attained the highest percentage in the leadership checklist 100%, but the other items recorded 0%.

Table (4) Checklist of planning\ statement (6)

6.Planning							
6.1 Formulate actions to address your risks and opportunities	1Completely applied & Completely documented	2Completely applied & partially documented	3Completely applied & not documented	4Partially applied & completely documented	5Partially applied & partially documented	6Partially applied & not documented	7Unapplied & not documented
6.1.1 Develop processes and prepare plans to establish your EMS							
- Develop the processes that you need to meet EMS requirements.							*
- Establish processes needed to plan and implement your EMS.							*
- Implement processes needed to plan and implement your EMS.							*
- Maintain processes needed to plan and implement your EMS.							*
- Plan the establishment of your environment management system.							*
- Consider the scope of your environmental							*

management system (4.3).							
- Consider howyou're going to address your organization's context (4.1).							*
- Consider how you're going to determine your risk and opportunities (4.1).							*
- Consider how you're going to identify potential emergency situations (6.2).							*
- Consider how you're going to ensure that EMS achieves intended results.							*
- Establish environment management planning documents and records.							*
- Document the risks and opportunities that need to be addressed.							*
- Document the processes needed to plan and manage your EMS.							*
- Maintain and control your EMS planning documents and records.							*
Weights	0	1	2	3	4	5	6
Frequency	14	0	0	0	0	0	0
Weights * Duplicates	0	0	0	0	0	0	0
The weighted mean	Zero						
Percentage to match	0%						
The size of the gap	100%						

Table (4) recorded a gap size 100% versus a percentage match 0%, that's why the factory was not applied the ISO standards.

Figure (15) explained the percentage match of the leadership items.

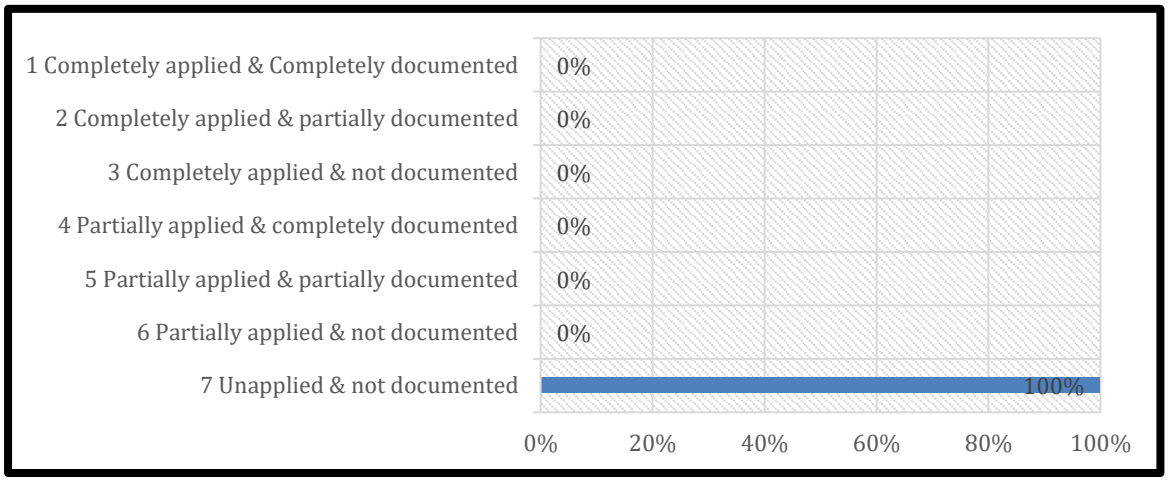


Figure (15) The percentage match of leadership checklist (ISO 14001: 2015)

Figure (15) clarified that the item unapplied & not documented is the highest percentage 100% but the other items were 0%.

Table (5) explained that the gap size was 100% which related to statement (7) that measures the support level in the factory.

Table (5) Checklist of support\ statement (7)

7.Support							
7.1 Support your EMS by providing the necessary resources	1Completely applied & Completely documented	2Completely applied & partially documented	3Completely applied & not documented	4Partially applied & completely documented	5Partially applied & partially documented	6Partially applied & not documented	7Unapplied & not documented
- Determine the resources that your environment management system needs.							*
- Provide the resources that your environmental management system needs.							*
7.2 Support your EMS by ensuring that people are competent	1	2	3	4	5	6	7
- Clarify your organization's environmental competence requirements.							*
- Identify those under your control who affect environmental performance.							*
- Identify the competence requirements of the people under your control who have an impact on your environment performance.							*
- Acquire competence whenever shortcomings are discovered.							*
- Acquire the necessary competence whenever people fail to meet your organization's environmental competence requirements.							*
- Document the competence of those who affect environmental performance.							*
- Retain your documentation and use it as evidence to show that people have the competence they need to handle the environmental aspects of activities, processes, products, services, and systems.							*
7.3 Support your EMS by making people aware of their duties	1	2	3	4	5	6	7
- Make personal aware of your organization's EMS.							*
- Share information about your EMS with the people who carry out work that is under your organization's control.							*
- Make sure that they are aware of your environmental policy.							*
- Make sure that they are aware of your environmental objectives.							*

- Make sure that they are aware of your environmental aspects.							*
- Make sure that they are aware of your environmental impacts.							*
Weights	0	1	2	3	4	5	6
Frequency	15	0	0	0	0	0	0
Weights * Duplicates	0	0	0	0	0	0	0
The weighted mean	Zero						
Percentage to match	0%						
The size of the gap	100%						

Table (5) results were explained the gap size attained 100% versus the percentage match was 0% because that the factory did not applicate ISO standard.

Figure (16) explaine the percentage match of the statement number (7)\ support.

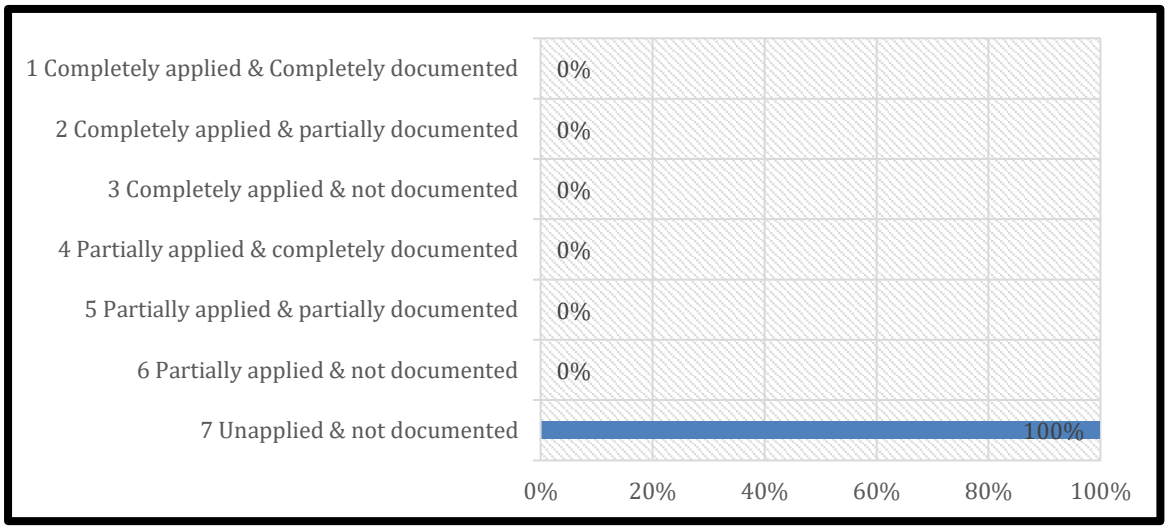


Figure (16) The percentage match of support statement

Figure (16) posits that there is no match of the statement (7)\ support in the factory.

Table (6) Checklist of operations\ statement (8)

8. Operations							
8.1 Establish your EMS processes and control how they operate	1Completely applied & Completely documented	2Completely applied & partially documented	3Completely applied & not documented	4Partially applied & completely documented	5Partially applied & partially documented	6Partially applied & not documented	7Unapplied & not documented
- Determine the environmental requirements that							*

processes must meet.							
- Specify environmental requirements for procurement process (as appropriate).							*
- Clarify environmental requirements for your product and service purchases.							*
- Specify environmental requirements for your design processes (as appropriate).							*
- Establish controls to ensure that environmental requirements are considered.							*
- Plan the implementation of your organization's EMS processes.							*
- Clarify the operating criteria that your EMS processes must meet.							*
- Develop controls for your environmental management processes.							*
- Consider using personnel to control your organization's processes.							*
- Consider using procedures to control your organization's processes.							*
- Consider using technologies to control your organization's processes.							*
- Consider using methodologies to control your organization's processes.							*
- Implement and control your organization's EMS processes.							*
- Use documents to show that EMS processes were implemented.							*
Weights	0	1	2	3	4	5	6
Frequency	14	0	0	0	0	0	0
Weights * Duplicates	0	0	0	0	0	0	0
The weighted mean	Zero						
Percentage to match	0%						
The size of the gap	100%						

The researcher resulted from table (6) that the factory did not applied the checklist related to statement (8)\ operations.

Figure (17) illustrated the percentage match of the statement (8)\ operation.

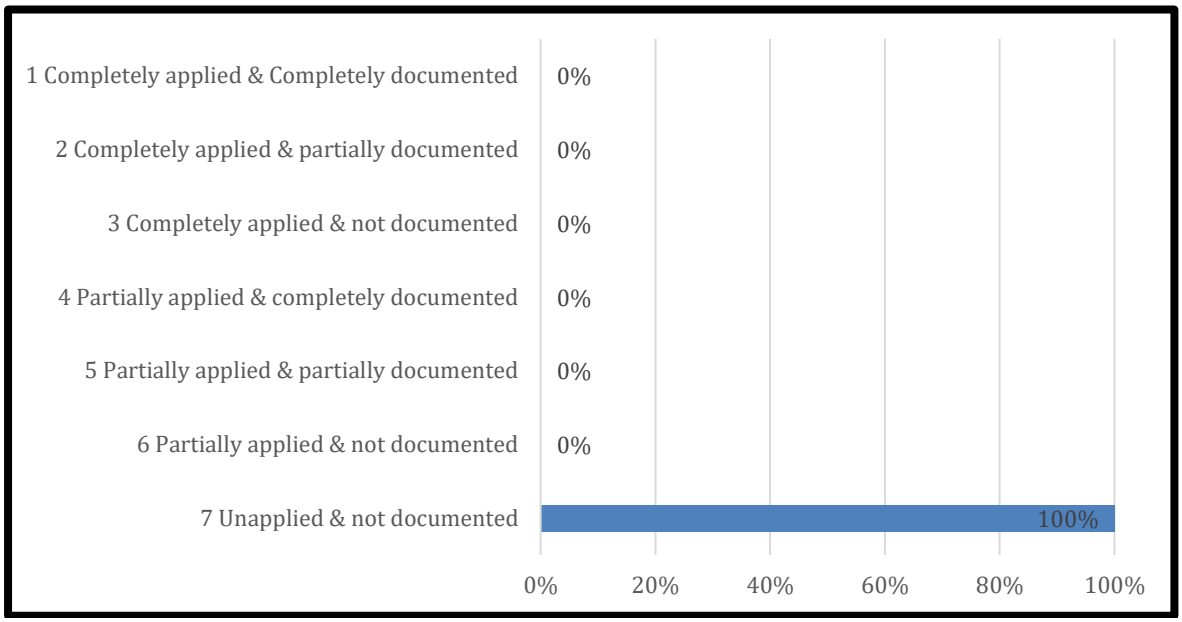


Figure (17) The percentage match of statement (8)\ operation.

Figure (17) clarified that the item unapplied & not documented attained the highest percentage versus the rest of items attained 0%.

Table (7) Checklist of Evaluation\ statement

9. Evaluation							
9.1 Determine your environmental performance and compliance	1Completely applied & Completely documented	2Completely applied & partially documented	3Completely applied & not documented	4Partially applied & completely documented	5Partially applied & partially documented	6Partially applied & not documented	7Unapplied & not documented
9.1.1 Investigate your organization's environmental performance							*
- Plan how you're going to investigate your environmental performance.							*
- Plan how you're going to monitor your environmental performance.							*
- Plan how you're going to measure your environmental performance.							*
- Plan how you're going to analyze your environmental performance.							*
- Plan how you're going to evaluate your environmental performance.							*
- Investigate your organization's environmental performance.							*

- Monitor your organization's environmental performance.							*
- Measure your organization's environmental performance.							*
- Analyze your organization's environmental performance.							*
- Evaluate your organization's environmental performance.							*
- Communicate your organization's environmental performance.							*
9.1.2 Evaluate your organization's environmental compliance	1	2	3	4	5	6	7
- Plan how you're going to find out if compliance obligations are being met.							*
- Flgure out how often environmental compliance should be evaluated.							*
- Establish suitable environmental compliance evaluation processes.							*
- Implement suitable environmental compliance evaluation processes.							*
- Maintain suitable environmental compliance evaluation processes.							*
- Take action to resolve environmental compliance shortcoming.							*
Weights	0	1	2	3	4	5	6
Frequency	17	0	0	0	0	0	0
Weights * Duplicates	0	0	0	0	0	0	0
The weighted mean	Zero						
Percentage to match	0%						
The size of the gap	100%						

The researcher summarized the results of table (7) that attained gap size 100% versus a percentage match reached to 0% because that the factory did not adopt the work flow with the statements of the checklist (9)\ Evaluation.

Figure (18) explained the percentage match of the above items.

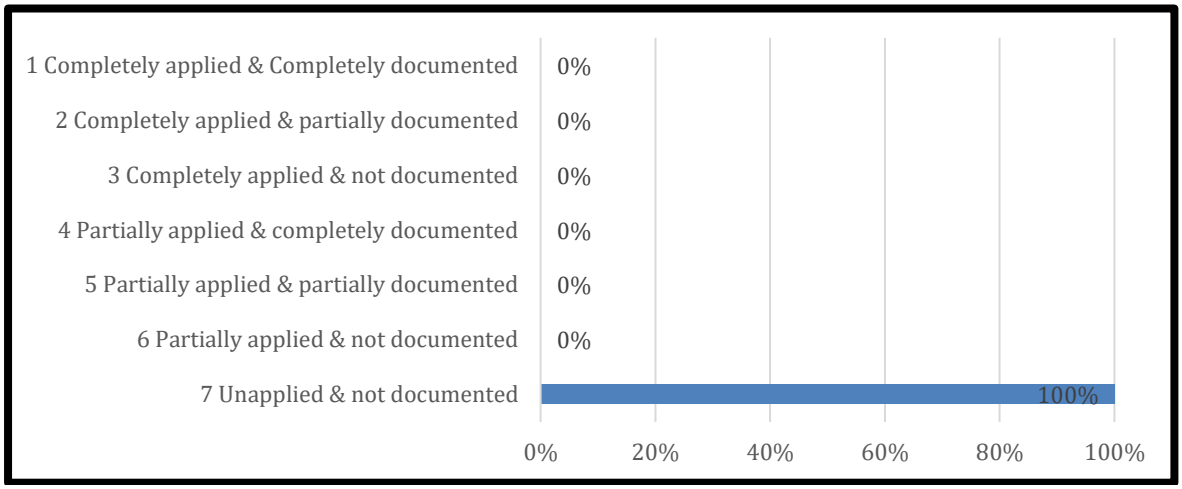


Figure (18) The percentage match of checklist (ISO 14001: 2015)\ statement (9)\ Evaluation

Table (8) Checklist of Improvement\ statement (10)

10. Improvement							
10.1 Take action to improve your EMS and achieve intended outcomes	1Completely applied & Completely documented	2Completely applied & partially documented	3Completely applied & not documented	4Partially applied & completely documented	5Partially applied & partially documented	6Partially applied & not documented	7Unapplied & not documented
- Determine opportunities to improve EMS and achieve its intended outcomes.							*
- Take all necessary actions to improve EMS and achieve its intended outcomes.							*
- Use performance evaluation outputs to improve your organization's EMS.							*
- Use compliance evaluation outputs to improve your organization's EMS.							*
- Use management review outputs to improve your organization's EMS.							*
- Use internal audit outputs to improve your organization's EMS.							*
10.2 Control nonconformities and take appropriate corrective action	1	2	3	4	5	6	7
- React to your organization's nonconformities.							*
- Take action to control nonconformities.							*
- Deal with all relevant consequences.							*
- Evaluate the need to eliminate causes.							*

- Review nonconformity and identify causes.							*
- Determine if similar nonconformities exist.							*
- Decide if corrective action should be taken.							*
- Develop corrective actions to address causes.							*
- Implement corrective actions to address causes.							*
- Review the effectiveness of your corrective actions.							*
- Document your nonconformities, actions, and results.							*
10.3 Enhance the suitability, adequacy, and effectiveness of your EMS	1	2	3	4	5	6	7
- Enhance your organization's environmental performance.							*
- Continually improve the performance of your EMS.							*
- Continually improve the suitability of your EMS.							*
- Continually improve the adequacy of your EMS.							*
- Continually improve the effectiveness of your EMS.							*
Weights	0	1	2	3	4	5	6
Frequency	22	0	0	0	0	0	0
Weights * Duplicates	0	0	0	0	0	0	0
The weighted mean	Zero						
Percentage to match	0%						
The size of the gap	100%						

The results of table (8) were a gap size was 100% versus a percentage match 0% that's why the factory did not achieve the improvements system in the factory.

Figure (19) summarized all the results of improvement item.

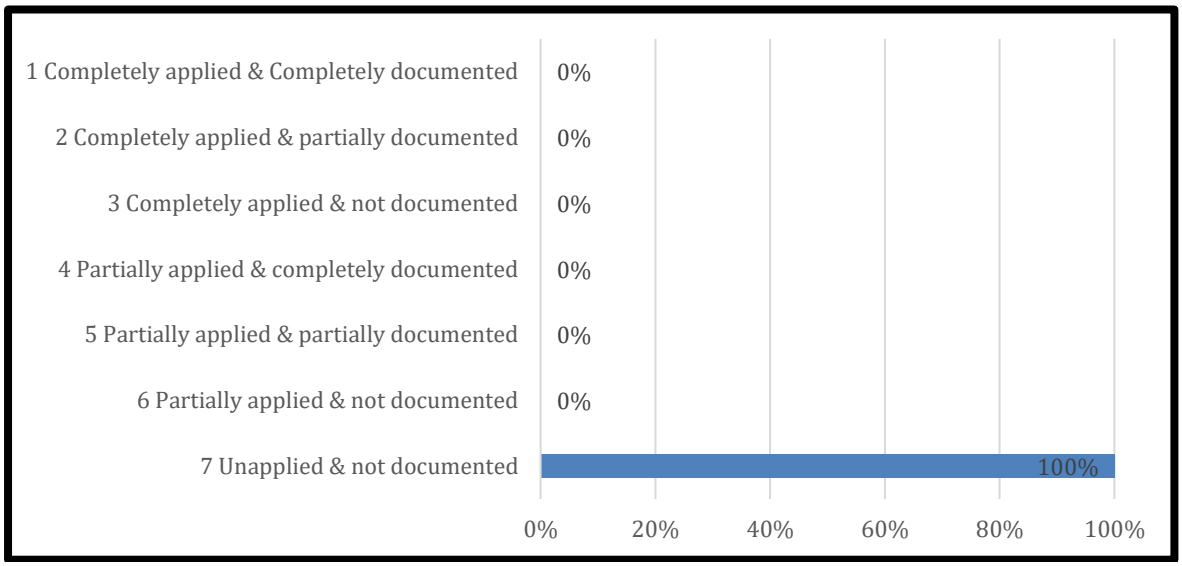


Figure (19) The percentage match of improvement statement.

Figure (19) clarified that the item of unapplied & not documented reached to the highest percentage in the checklist versus 0% of the rest of items.

5- Conclusions

1- The main problem in factory must treated the gap size by using the ISO standards.
2- The (3Rs) strategy did not applied completely in the factory, expect the first (R) related to recycling industry.
3- There is no a framework for depending the sustainable waste management.
4- There are many limitation in appalling the (3Rs) strategy in the factory of AL-Mahmoudiyah.

6-Recommendations

1- Concentrate on the financial resources to developing the factory by using (ISO standard).
2- Use the (3Rs) strategy as apriority of top management in the factory to promote the recycle industry.
3- Develop and implement effective mechanism for minimizing waste and designing recycling-friendly products.
4- Develop the technologies related to waste management and (3Rs) to reach to cost-effective and sustainable.

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