

The International Youth Environmental Competition



Research Project Title عنوان المشروع البحثي

Improving Recycling and Waste Management in Qatar

تحسين ادارة التدوير و النفايات في قطر

Dedications and thanks:

We would like to dedicate this project to every special education student in the world and especially in Qatar. we would like to tell them never stop dreaming since we aim to be the change and we will be starting by making others believe in us, because of what we have accomplished in the past and what we will accomplish in future.

Special thanks to her highness Sheikha Moza, for her continuous support for equal education for all without any discrimination.

Also special thanks to Awsaj Academy's teachers and director for always trying to bring the best out of us, so others know we might be different than them but for sure we can do unique work like them and why not better sometimes.

The content indexes:

Content	Pages
Introduction	1-3
Literature review	3-4
Methodology	5-20
Data Analysis and Results	21
Conclusion and recommendations	22
References	24

Figures index

Content	Pages
Figure 1 Qatar waste manager market leaders As well as figure 2 market concentration graph	4
Figure 3 Number of solid waste factories in Qatar and figure 4 solid waste management graph	5
Survey 1 and 2 charts	6-18

Project summary

The sustainable recycling and waste management projects in Qatar are a crucial initiative that aim to maintain environmental sustainability. It introduces advanced recycling technologies for efficiently processing materials like plastic, metals, and papers, which help in reducing landfill use. Moreover, the central part of the initiative is related to establishing public awareness with educational campaigns designed to enrich a culture of waste reduction and recycling. Additionally, it emphasizes organic waste management through composting, and contributing to agricultural productivity. These combined help in making Qatar's commitment to environmental sustainability and its 2030 vision to be achieved.

I- Introduction:

Qatar economic growth witnessed a noticeable increase throughout the last few years, which has led to large increase in its population, thus a notable rise in consumption pattern which cause waste generation to increase considerably.

It is well known that during the preparation for the 2022 FIFA World Cup, all the constructions that took place has generated a lot of demolition waste, also with the tourism and hospitality sector's growth has played an important role in waste generation increase mainly food waste and single-use plastics. Finally, the shift to modern technology generates a lot of e-wastes since old devices are replaced.

All those changes triggered Qatari government various initiative programs that promote recycling, reducing waste and encourage responsible consumption. For example: waste to energy projects, preventing the single use plastic consumption, sustainable practice approaches on increasing recycling initiatives like cardboard local manufacture and recycling factories as well as manufacture of fully recyclable plastic bottles by Rayyan Water company and many other initiatives that embed that Qatar Vision 2030 to balance between its economic growth and environmental sustainability.

a) The project's problem:

The main problem for Sustainable Recycling and Waste Management Practices in Qatar is that it faces a lot of challenges which are:

- i) Lack of awareness about the importance of recycling and reasonable waste consumption.
- ii) Lack of recycling factories, as well as unorganized collection and processing of wastes where few recycled bins are placed around the country, as well as lack of people knowledge how to separate their wastes.
- iii) Qatar is ranked as one of the highest Per Capita waste Generation in the world due to the large amount of single use plastics and packaging.
- iv) Quick economic growth.
- v) E-waste challenges from shifting to modern technology systems.
- vi) Landfills for waste disposal.

b) The project's Goal:

The main goal for Sustainable Recycling and Waste Management Practices in Qatar is to enhance environmental sustainability and resources conservation in the country through multiple steps like:

- Reducing waste generation
- Minimizing landfill dependency
- Increasing awareness about recycling and its importance
- Improving waste processing and collecting
- Proper disposal and recycling of e-wastes
- Encouraging circular economy that consider all resources as valuable thus making sure to reuse, recycle and reduce.

c) The project's hypothesis:

We have based our hypothesis on theories whose content is shaped by previous experiences throughout the world as well as environmental sustainability books related to these theories, for example: environmental system and societies 2015 edition, living in the environment 16th edition.

Here is our combined hypothesis:

- i) Increase public awareness through educational campaigns and creating environmental course to be taught in schools will lead to an increase in the recycling rates at the community.
- ii) Encouraging the implantation of recycling incentive programs for households will help to increase recycling rates in community.
- iii) Community -based composting programs will decrease the amount of organic waste disposed thus decrease the production of greenhouse gasses emission while promoting for a sustainable waste management practice and the compost produce can be used in gardening and vegetation initiatives.
- iv) The implementation of pay-as-you-produce system for manufacturing companies where taxes are added based on the impact of their products recyclability and environmental impact as well as packaging thus forcing them to come up with eco-friendly design and waste reduction.
- v) Establish waste to energy factories or even use clean energy like solar energy to decrease the use of fossil fuels as source of energy thus decreasing carbon footprint.

d) The project's importance:

Sustainable Recycling and Waste Management Practices are important for several reasons which are environmental conservation, resource conservation, economic benefits, pollution reduction, conservation of ecosystems, public health, energy recovery, regulatory compliance, long-term sustainability, and community engagement.

e) The project's question:

How can we implement effective strategies and technologies to promote sustainable recycling and waste management practices in Qatar to reduce environmental impact and enhance resource efficiency?

II- Literature review:

In their long-term sustainable process being one of the highest per capita waste generations globally mainly with solid wastes, Qatar has implemented several waste management policies and regulations to establish a sustainable environmental practice. For example: Qatar National Vision 2030, Qatar National Development Strategy that both mainly aim to reduce waste generation as well as increasing recycling rates to develop a sustainable waste treatment.

Qatar has followed a well-studied strategies to achieve its goals, these included waste segregation at the source where people are advised through awareness campaigns and television shows to be responsible citizens and separate their waste from home. These campaigns included environmental standards and procedures on how to handle wastes, their transportation and disposal thus ensure a sustainable waste management. In addition to that Qatar has implemented efforts to improve landfill management were using of modern technology in agriculture is used to reduce the potential of ground water contamination, as well as improve product outcomes.



One other main challenge is the limited infrastructure for efficient waste managements and recycling, although Qatar has a well noticed economic development but still not enough recycling infrastructures are being created, for example: the Domestic Solid Waste Management Centre (DSWNC) in Mesaieed is the largest composting facility in Qatar that can process 550 tons of waste per day, but the country required more centers like that, event though Qatar has factories to recycle cardboards and supply all the requirements of the nation but plastic wastes recycling factories are not enough which is causing marine life to be endangered thus it is required to follow Al Rayyan Water company and start having a fully recyclable water bottles and why not transfer to cardboard water bottles to decrease plastic usage as a sustainable point of view for future generation.

Qatar Solid Waste Management Market Leaders

- 1 Seashore Group of Companies
- 2 Dulsco Qatar
- 3 Power Waste Management & Transport Co. WLL
- 4 Green Waste Management
- 5 Al Haya Enviro

*Disclaimer: Major Players sorted in no particular order

Figure 1

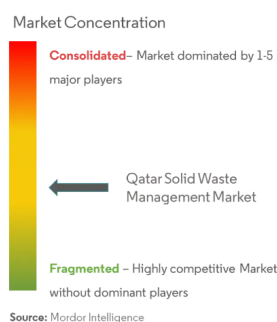


figure 2

8. COMPANY PROFILES

- 8.1 Seashore Group of Companies
- 8.2 Dulsco Qatar
- 8.3 Power Waste Management & Transport Co. WLL
- 8.4 Green Waste Management
- 8.5 Al Haya Enviro
- 8.6 Al Hodaifi Group (Recycling)
- 8.7 Averda Environmental Services (Qatar) WLL
- 8.8 Bin-Ovation
- 8.9 Boom Waste Treatment Company
- 8.10 Elite Paper Recycling

Countries in the Gulf region like UAE, Kuwait, Saudi Arabia, Bahrain faces common challenges as Qatar with respect to their rapid urbanization, population growth as well as their high level of waste generation per capita, as well as heavy reliance on landfills historically. Moreover, these countries have focused on finding solutions together like investing in waste to energy projects and recycling facilities, in

addition to that relying on international cooperations that can benefit them to learn about best practices and expertise in waste management around the world.

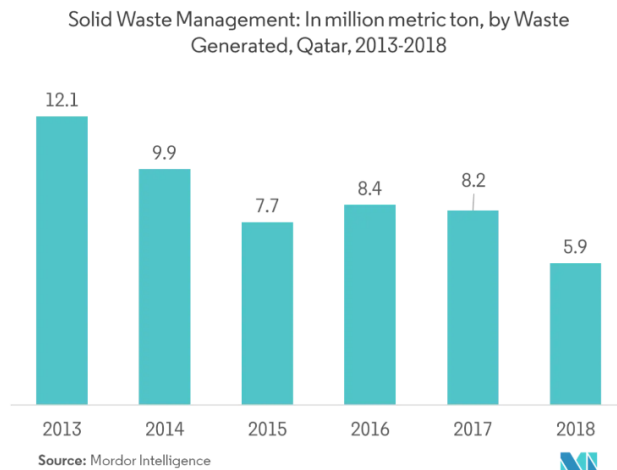


Figure 3



figure 4

III- Methodology:

a) Study approach and research sample:

we will conduct a quantitative and qualitative methods to support our study which will be as follows:

- 1) Data collecting from collecting information from previous studies in this field.
- 2) Developing a structured Survey that focus on waste disposal habits, awareness of recycling programs, and opinions on current waste management practices.
- 3) Conduct interview with teachers and specialists of the waste management field.
- 4) Analyze the data collected from various samples that cover different age groups, specialist, educators, and others.
- 5) Provide recommendation and suggestions to involve waste management's studies in schools from kindergarten to high school as well as universities.

b) Research result:

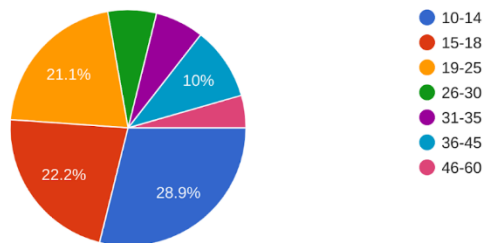
Based on the survey and interviews conducted we were able to have an initial overview for the waste management topics in Qatar, which was

characterized by realism and a logical view of various elements involved in the research study

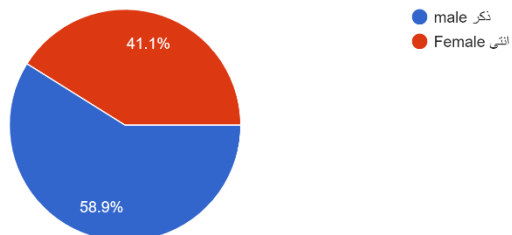
c) Project survey and its results:

we have conducted two surveys where the first one was related to people general knowledge about waste management and here is the results of 90 responses

1-what is your age range ما هي فئتك العمرية
90 responses

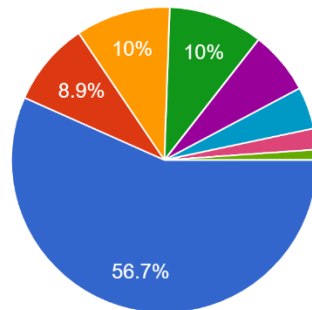


2-Gender
90 responses



3-what is your level of education ما هو مستواك التعليمي

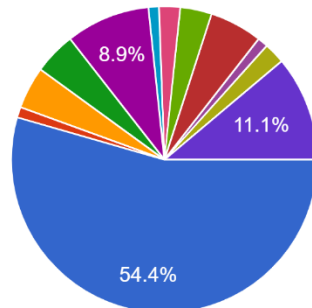
90 responses



- middle or high school student طالب ثانوي او متوسط
- high school graduate خريج ثانوية عامة
- diploma degree دبلوم
- bachelor degree بكالوريوس
- master degree ماجستير
- Doctor degree دكتوراة
- university student طالب جامعي
- other اخرى

4-what is your occupation مهنتك

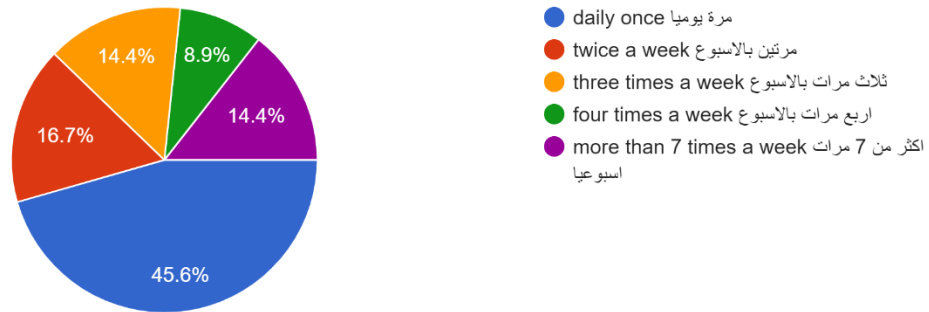
90 responses



- student طالب
- teacher مدرس
- business man رجل اعمال
- free lancer عمل حر
- Government field (army, police ...) مجال...
- Environmanist عالم بيئة
- house wife ربة منزل
- doctor / nurse ممرض / طبيب

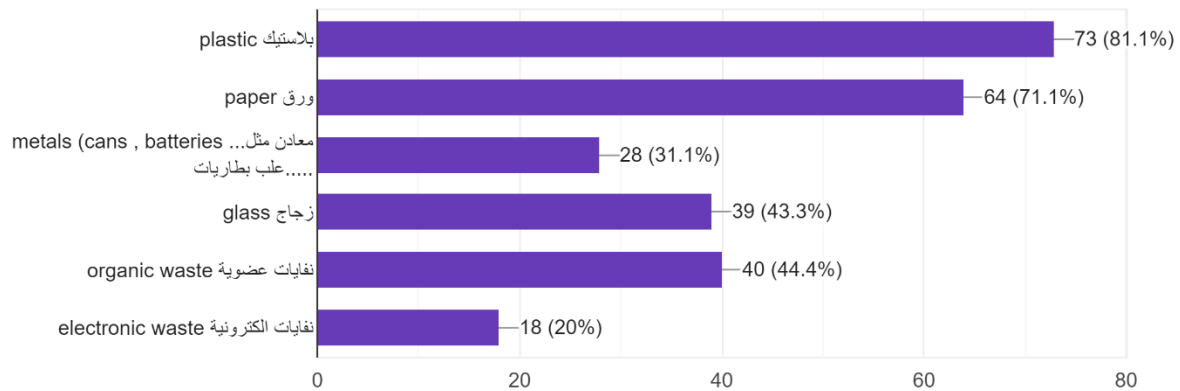
5-How often do you dispose household waste? كل متى تتخلص من النفايات المنزلية?

90 responses



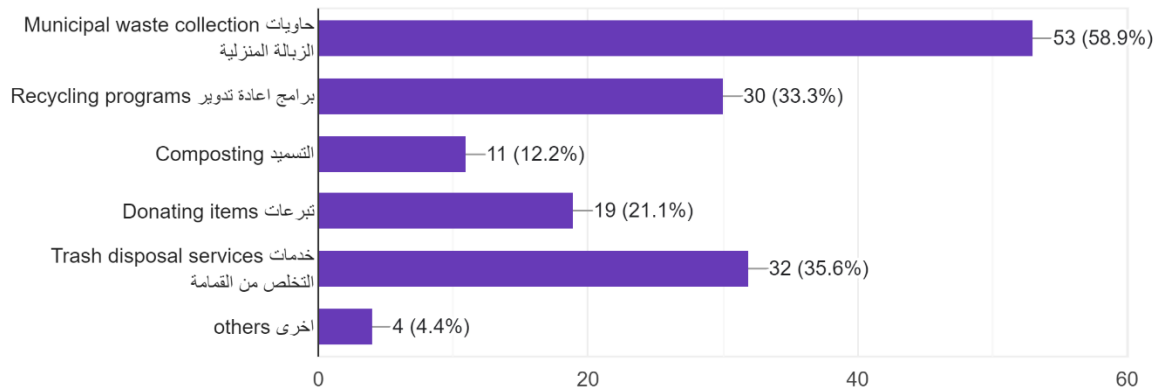
6-What types of waste do you typically generate at home? (Select all that apply) ما هي أنواع النفايات التي تولدها عادة في المنزل؟ (اختر كل ما ينطبق)

90 responses



7-How do you currently dispose of your household waste? (Select all that apply) كيف تتخلص حاليًا من نفاياتك المنزلية؟ (اختر كل ما ينطبق)

90 responses

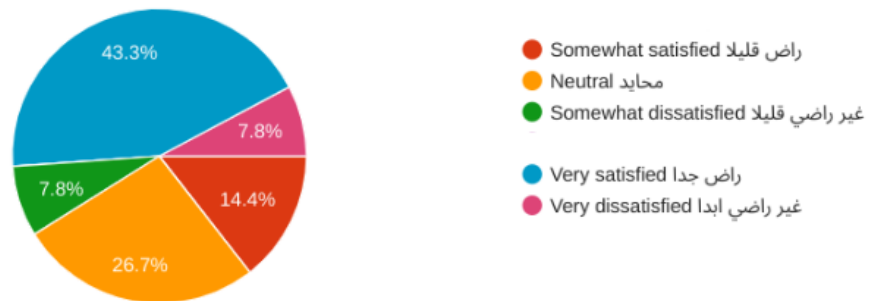


8-Are you satisfied with your current waste disposal methods?

Copy

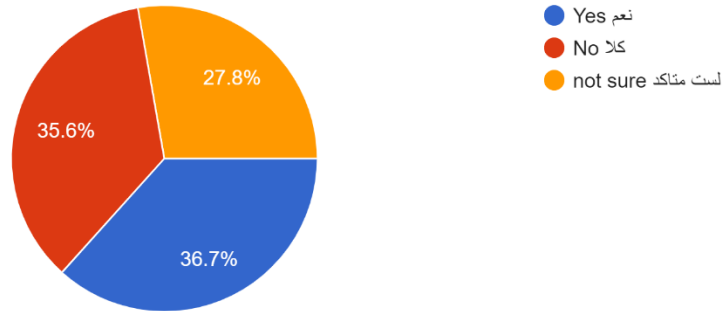
هل أنت راضٍ عن طرق التخلص من النفايات الحالية؟

90 responses



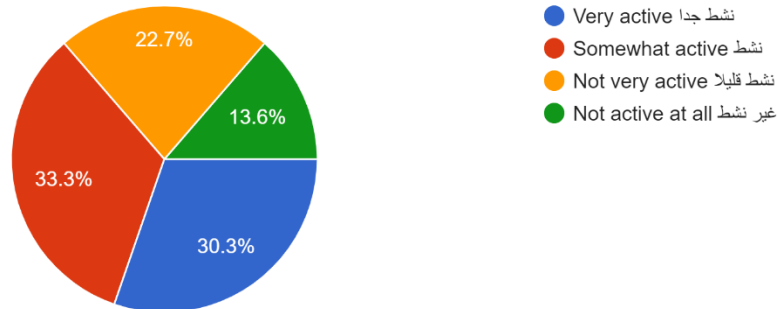
9-Are you aware of local recycling programs in your community? هل أنت على علم ببرامج إعادة التدوير المحلية في مجتمعك؟

90 responses



10-If your answer is yes on question nine , how would you rate your level of participation in these programs? إذا كانت الإجابة بنعم على سؤال التاسع، كيف تقيم مستوى مشاركتك في هذه البرامج؟

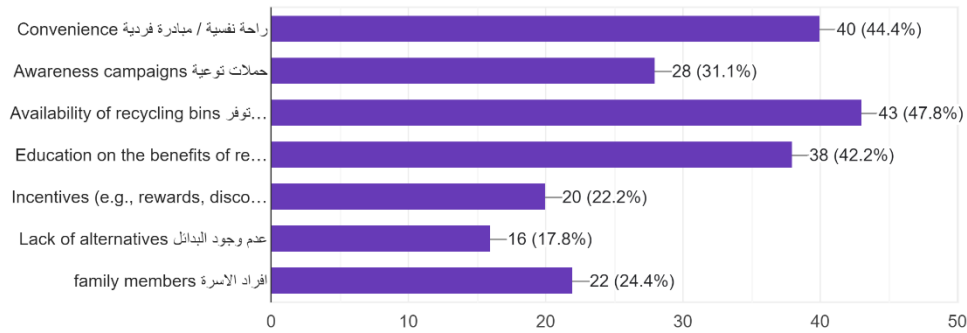
66 responses



11-What factors influence your decision to participate in recycling programs? (Select all that apply)

ما هي العوامل التي تؤثر على قرارك بالمشاركة في برامج إعادة التدوير؟ (اختر كل ما ينطبق)

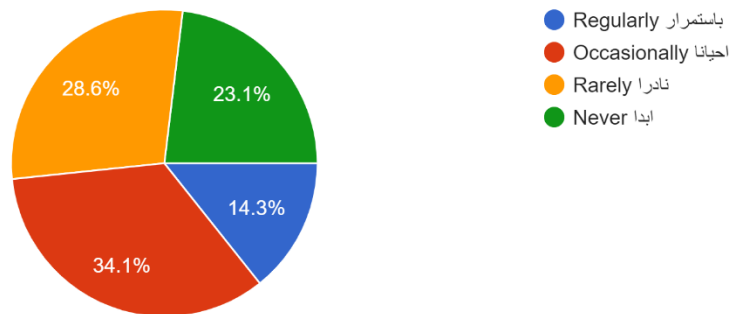
90 responses



12-How frequently do you participate in local recycling programs? إعادة التدوير

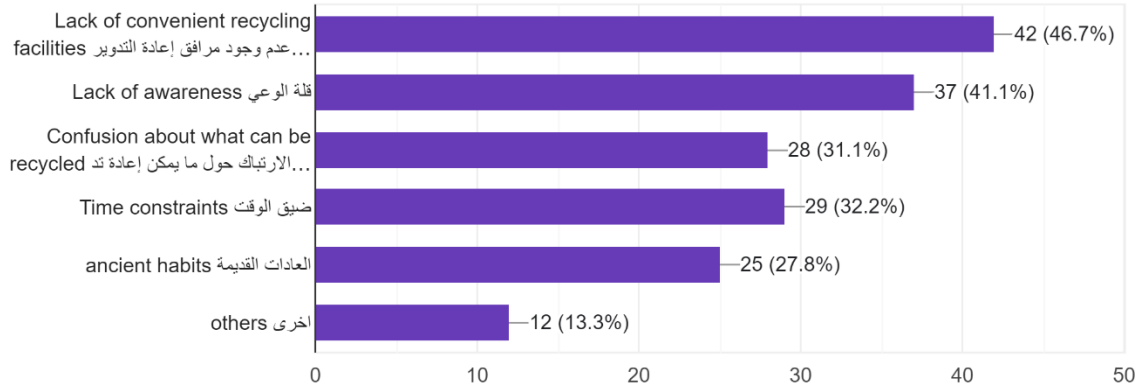
المحلية؟

91 responses



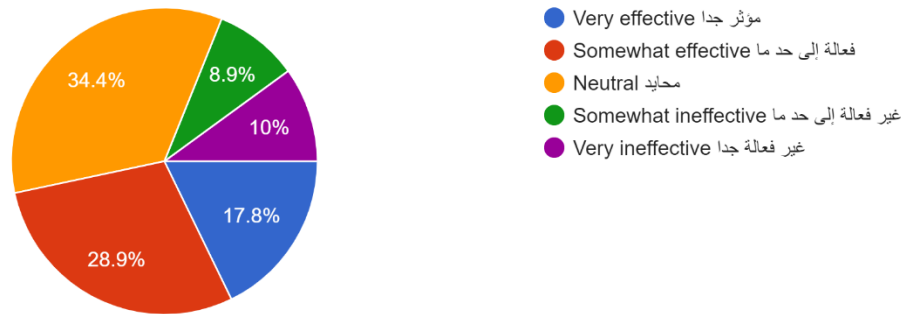
13-What challenges, if any, do you face in participating in recycling programs? (Select all that apply) ما هي التحديات، إن وجدت، التي تواجهها أثناء المشاركة في برامج إعادة التدوير؟ (اختر كل ما ينطبق)

90 responses



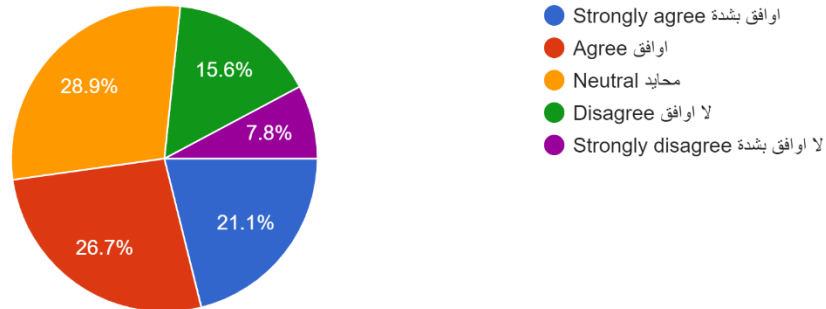
14-How would you rate the overall effectiveness of waste management practices in your community? كيف تقيم الفعالية الشاملة لممارسات إدارة النفايات في مجتمعتك؟

90 responses



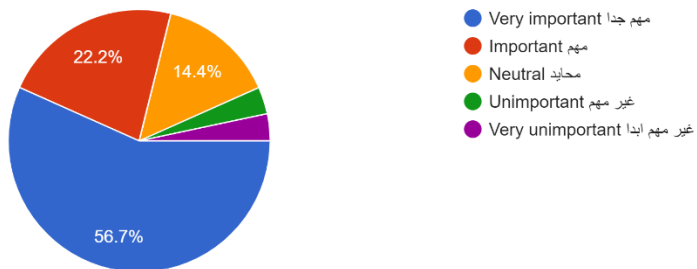
15-Do you think there is enough emphasis on reducing waste in your community? هل تعتقد أن هناك تركيزًا كافيًا على تقليل النفايات في مجتمعك؟

90 responses



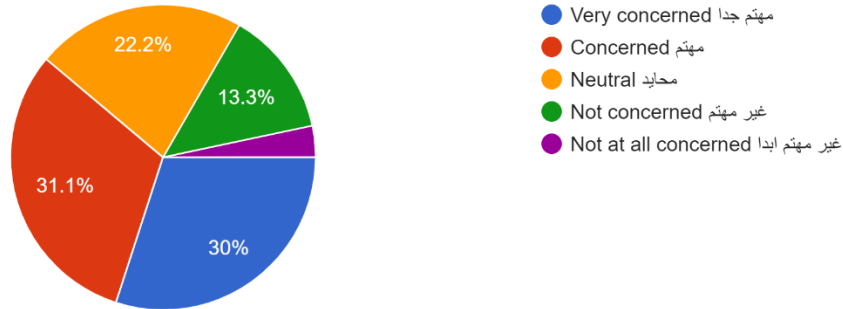
16-How important do you believe public education is in promoting effective waste management practices? ما مدى أهمية التعليم العام في تعزيز الممارسات الفعالة لإدارة النفايات؟

90 responses



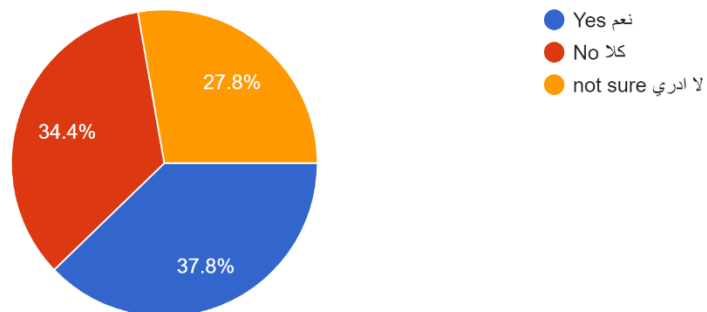
17-How concerned are you about environmental issues, including waste management, in your community? ما مدى اهتمامك بالقضايا البيئية، بما في ذلك إدارة النفايات، في مجتمعك؟

90 responses



18-Have you personally taken any steps to reduce your environmental impact, aside from waste management? هل اتخذت شخصيًا أي خطوات لتقليل الأثر البيئي، بخلاف إدارة النفايات؟

90 responses

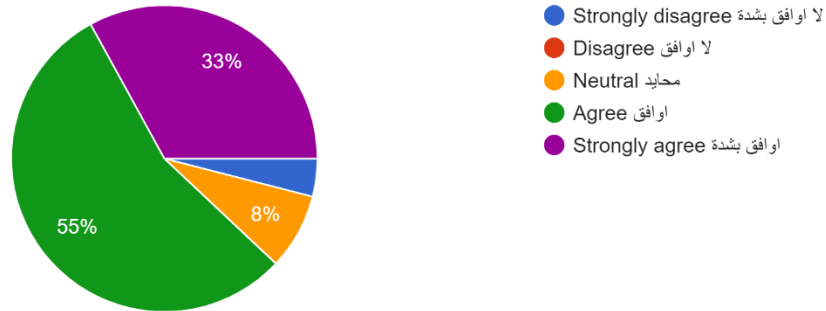


in addition to above questions there were a question that states “In your opinion, what could be done to improve waste management practices in your community?”

multiple answers were received and based on those answers that focused mainly on awareness campaigns and increase recycling factories a second survey was created that focus on solutions related to waste managements and shared with people to complete and the results were as follows:

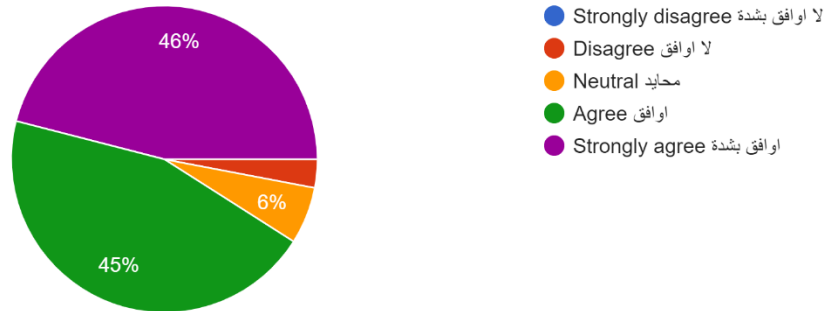
1- increasing public awareness through educational campaigns related to waste management is needed هل نحتاج زيادة الوعي العام من خلال الحملات التثقيفية المتعلقة بإدارة النفايات

100 responses



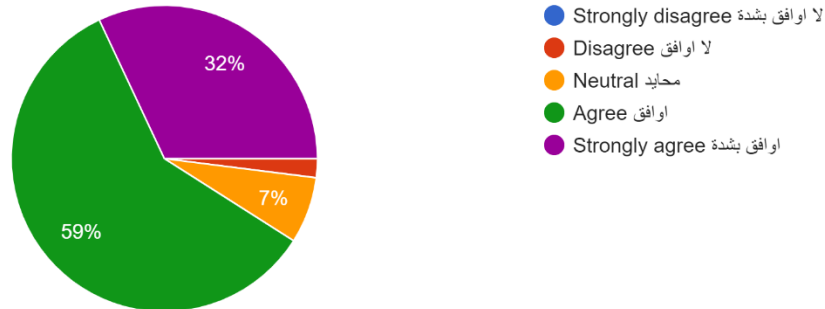
2-including waste management techniques in schools is considered as an important solution ويعتبر تضمين تقنيات إدارة النفايات في المدارس حلاً مهماً

100 responses



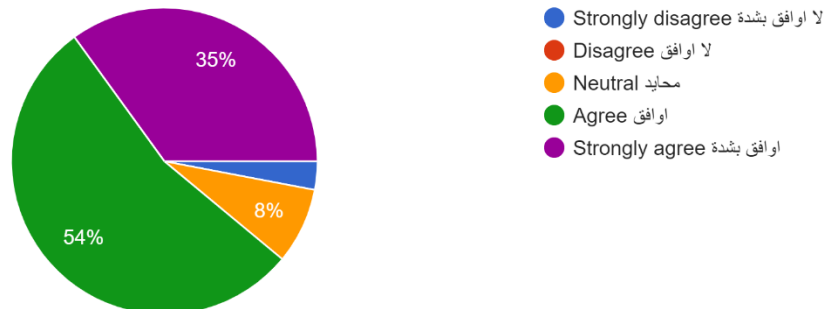
3-Encouraging the implantation of recycling incentive programs for households will help to increase recycling rates in community. إن تشجيع بدا برامج حوافز إعادة التدوير للأسر سيساعد على زيادة معدلات إعادة التدوير في المجتمع.

100 responses

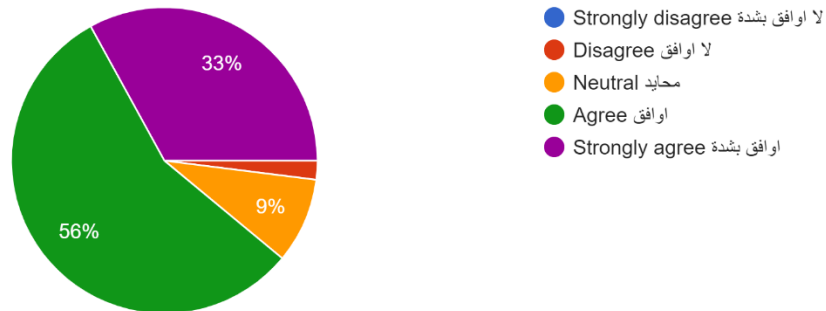


4-Community -based composting programs will decrease the amount of organic waste disposed thus decrease the production of green house gasses emissi...تخدام منتجات السماد في مبادرات البستنة والغطاء النباتي...

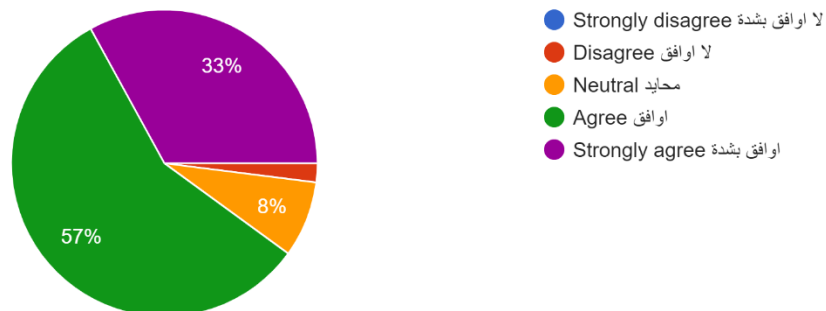
100 responses



5-The implementation of pay-as-you-produce system for manufacturing companies where taxes are added based on the impact of their products recyclability ...
 100 responses



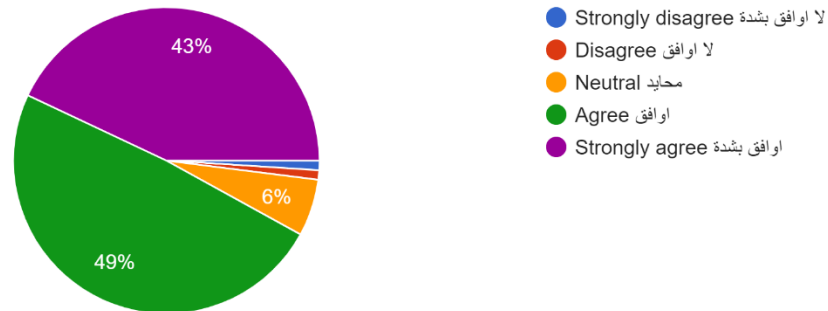
6- Establish waste to energy factories or even use clean energy like solar energy to decrease the use of fossil fuels as source of energy thus decreasing ca...
 100 responses



7- moving from plastic products to cardboard and less hazard materials is a must يعد الانتقال من

المنتجات البلاستيكية إلى الورق المقوى والمواد الأقل خطورة أمرًا ضروريًا

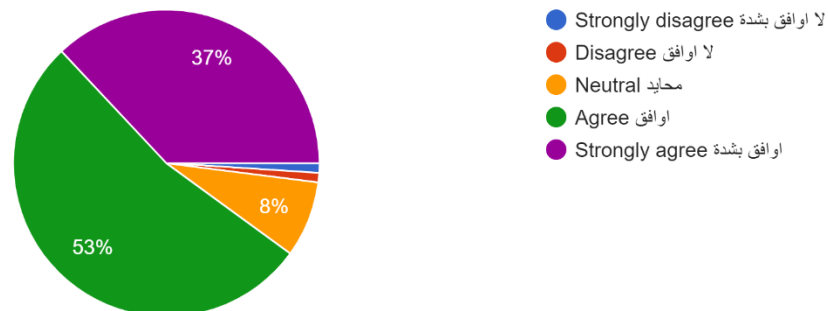
100 responses



8- increase recycling factories in country to include glass and metals wastes is a must ضرورة زيادة

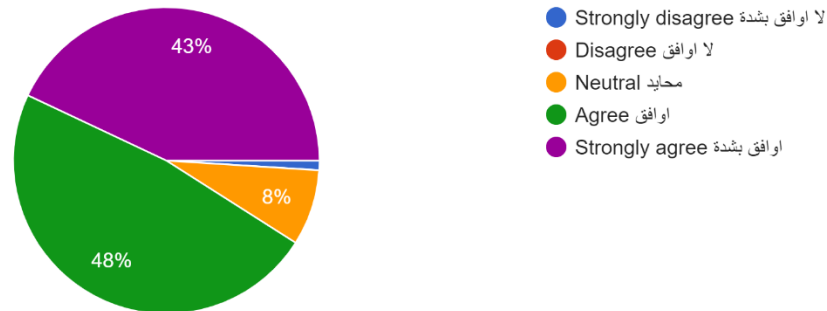
مصانع إعادة التدوير في الدولة لتشمل مخلفات الزجاج والمعادن

100 responses



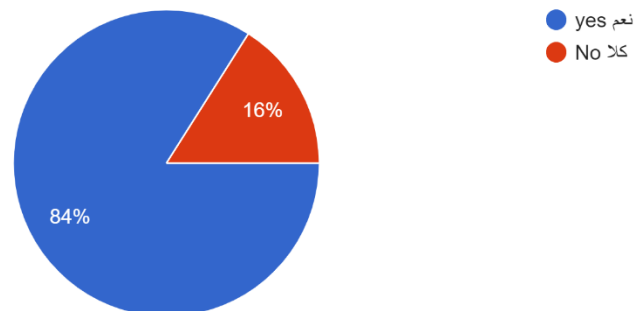
9- establish a well studied economic growth is a must is one of solutions
 إرساء نمو اقتصادي مدروس أمر لا بد منه وهو أحد الحلول

100 responses



10- are you willing to take initiative and start by your self in taking first step to reduce environmental
 hazard wastes هل أنت على استعداد لأخذ زمام المبادرة والبدء بنفسك في اتخاذ الخطوة الأولى لتقليل النفايات البيئية الخطرة

100 responses



d) Specialist interviews survey:

We have also reached out to almost every waste management company in Qatar to conduct a survey question with them, most of them either declined or did not get back to us, the only one that cooperated with us was seashore recycling.

Here are the questions and their answers by Ms. Dharshana Rajagopal who is the Business Partnerships Manager at Seashore recycling Qatar.

1- Policy and Strategy:

How does your organization approach waste management, and what is the overarching strategy or policy in place to promote sustainability in recycling practices?

- Waste Management Plan
- Waste Audits
- Awareness Session
- Campaigns

2- Circular Economy:

How does your company or organization contribute to the concept of a circular economy, and what steps have been taken to minimize waste generation throughout the product life cycle?

- Our company runs up and running recycling facilities
- We make sure most of our process efficiently use the material and also most of the waste is diverted from landfill.

3- Technological Innovations:

Can you discuss any innovative technologies or methods your organization employs to enhance recycling processes and reduce environmental impact?

- Reducing the use of single-use items
- Making sure reusable items are only used.
- Reducing waste to landfill by recovering most of the materials from a waste stream
- Recycling possible waste streams

4- Waste Reduction Targets:

What specific waste reduction targets or goals has your organization set, and how are you working towards achieving them?

- Identifying technologies that can recover maximum from our waste streams, through R&D and pilot studies.

5- Material Recovery:

How does your company prioritize and implement the recovery of valuable materials from waste streams, and what percentage of materials are typically recovered?

- 80% of our materials are recovered through our recycling facilities.
- Efforts to increase material recovery rate through R&D and pilot study

6- Collaboration and Partnerships:

Are there any collaborations or partnerships your organization has engaged in to improve waste management practices or promote sustainability? How have these partnerships been beneficial?

- We partner with organizations, schools, universities, local interest groups and communities to promote sustainability like Qatar Foundation, Qatar Museums, Baladiya, Tariq Bin Zayed School, Qatar University, Qatar Academy etc.
- They have been beneficial as they convey the message in a stronger way and reach a greater audience

7- Public Engagement and Education:

How does your organization engage with the public to raise awareness about sustainable waste management practices, and what educational initiatives are in place?

- Yes, we actively engage in activities to raise awareness such as educational workshops, seminars, clean ups, recycling programs with schools, universities, and organizations.

8- Waste Audits and Monitoring:

How often does your organization conduct waste audits, and how is the data used to improve waste management practices? Are there any key insights or changes that have resulted from these audits?

- We conduct waste audits for organizations that approach us for recycling and we use them to propose a catered recycling program for the organization

9- Compliance and Regulations:

How does your organization ensure compliance with local and international regulations related to waste management, and how do you stay informed about evolving regulations in this field?

- Constant participation in waste conferences and seminars
- Participation in government organized conferences and workshop
- Raising awareness through social media channels and events to convey laws of the government.

10- Social Responsibility:

In what ways does your organization contribute to the social aspects of sustainability in waste management, such as job creation, community engagement, or addressing social equity in waste management practices?

- Job creation- we have up and running recycling factories in which we have provided jobs for more than 3000+ employees
- SEASHORE's community efforts to raise awareness through events, seminars, campaigns and workshops can be viewed at their social media channels like @seashoreqatar, @seashoresustainability.

e) Challenges that we encountered during our study:

- i) Participant recruitment that represents a diverse sample related to age, profession and even Gender.
- ii) Contacting specialists to get information from them.
- iii) Lack of information on Government sites.
- iv) Local privacy laws and cultural expectations to gain trust from participants.
- v) Ensuring that research approach is culturally appropriate.

IV- Data Analysis and Results

Based on above studies and surveys, we can say the following about the first survey:

- Survey included both genders with different levels of education and age range.
- 45.6% dispose household wastes on daily basis which is a high percentage that require waste management.
- Most of waste products are plastic 81.1% that is an issue that should be solved since only 30% recycle and 58.9% just dispose them in municipal waste collection without separating waste to make it easier to recycle them, that goes back to lack of awareness and that was shown when 35.6% said they are not aware of local recycling programs and 27.8 % said not sure about it. Also, those who are aware only 30.3% of them do recycle which is a low number.
- Most of challenges according to people surveyed were lack of convenient recycling facilities 46.7% and lack of awareness 41.1 %, and that shows in th2 26.7% who said disagree and 28.9 % said neutral while only 7.8% said agree to question if there is enough awareness on reducing waste programs.
- Although most around 61% said that they are concerned about environmental issues, but they don't show effectiveness since they lack awareness.

In the second survey that was answered by same people we focused more on steps how to spread awareness to community:

- 88% said increasing public awareness is needed.
- 91 % said including waste management technique in schools is important.

- 81% said encouraging implantation of recycling incentives programs for household will help to increase recycling rates in community.
- 89% of people encourage composting programs.
- 89% of people encourage idea of adding taxes on companies' products recyclability.
- 90% of people emphasis on establishing waste to energy factories and use of clean energy is a must.
- 92% of people with banning one use plastic products.
- 90% with increasing recycling factories
- 91% with encouraging establishing a well-studied economic growth.
- 84% are willing to be the change and take first step to reduce environmental hazard wastes.

The results of second survey shows that people awareness has been improved and we should work on increasing that awareness to others to help our environment as well as planet sustainability and survival.

V- Conclusion and recommendations

As a conclusion, exploring sustainable recycling and waste management practices in Qatar has shown both the positive steps taken and the areas where there's room for improvement. Qatar is making a huge effort to be more environmentally friendly, but we have found that there's still work to be done. Learning from examples worldwide, incorporating new technologies into waste management, and getting the community involved those all are the key steps to make the system more efficient and sustainable.

Also encouraging people to recycle through awareness campaigns and partnering with different groups can help build a culture of responsible waste management. when the government, businesses, and community work together, we can make a real difference. As Qatar moves forward, implementing the recommendations like better recycling policies and regulations the country can set and example for others and

contribute to a cleaner, greener future. These changes on environmental and economical steps can show the huge benefits which are right direction to move forward, thus everyone is encouraged to start to be the change.

Reference:

companies:

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6-[Waste Management – a Qatari perspective](#) Andrew Symms - Consultant

7-[Waste management in Qatar Bioenergy consult](#) May 25, 2023

links to the google forms used:

[first survey link](#), [second survey link](#)