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The Economics of Waste Recycling in Iraq: Wasted Resources and Lost Opportunities

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Abstract

The issue of remediation and recycling wastes in contemporary civilization is of a paramount importance economically, this is because the human leaves behind him a huge amount of waste in various types through his consumption and his daily life practices and these wastes are handled incorrectly around the world. This has led to the destruction of many components of the environment as well as the tremendous waste of available resources in the recycling and re-processing operations of different types of wastes, such as reuse it as raw materials again or reuse it in production of electric power through flammable types. In Iraq, especially after 2003, this problem takes serious trends, with increasing human consumption and with great economic openness, which led to a complex problem through pollution of the environment, waste of resources and lack of vision and mechanisms to deal with the huge quantities of waste and inability of the private sector to contribute in solving this problem as it fits with the size of the daily flow of inhabitants of large and small cities, as well as inhabitants of the suburbs and countryside. As this requires a clear path to activate the business sector related to recycling in an integrated way with other economic sectors, and this is can be done through backward and forward connections by creating an economic sector with the participation of governmental and private efforts that rise to the scale of the problem and find the correct way to the proper solution to this economic path in a way that provides opportunities and invests resources and limit their waste.

Keywords: *Waste, Waste recycling, Wasted resources, Lost opportunities*

Introduction

Waste is one of the things that raise human fears since the beginning of the history, where the human was always thinking about the proper way to get rid of his waste, especially, when it began to accumulate in his living area, for that he started thinking about innovative and appropriate mechanisms to solve this dilemma that has threatened his existence on this planet. Thus, he began throwing his waste away from the areas of his residence, but for many reasons he was not skilled in getting rid of his waste, especially, after the industrial revolution due to increasing rates of waste production associated with the economic growth and the changing of human life into more complex forms.

Therefore, many contributions have emerged, including the recycling of waste and the hypotheses of the recycling economy, which aims to eliminate the risk of pollution through the recycling of waste and work to preserve the forces of nature from the constant loss as these forces is one of the rulers of the ability of people to continue to live on the planet.

The problem of waste in Iraq has grown in a way that is related to the patterns of economic, social and political development, taking into consideration the jump in this phenomenon after 2003.

Importance of the study: It is an attempt to show the dangerous of the growing waste in the Iraqi economy, which is indicates a serious environmental disaster.

Objective of the study: The study aims to explain the behavior of the phenomenon of waste production and its growth rates, as well as clarifying the economic feasibility of waste recycling processes and proposing mechanisms to deal with this dangerous phenomenon.

Hypothesis of the study: There is a possibility and economic feasibility of waste recycling processes according to the profit standard and through the indirect benefit within the framework of sustainable development in the Iraqi economy.

Study Approach: The study was based on the inductive method through starting from the explanation of the part to the whole and through the use of comparative historical, statistical and analytical methods to reach the desired results.

Methodology : The study organized in three sections , an introduction, a conclusion and a list of sources. The first section dealt with the nature and history of the problem of waste in Iraq and explain the historical background of this problem from the historical references, The aim of this section is to show the historical development of the phenomenon of waste production in Iraq according to historical sequence So that the reader can take an idea of it as a basis for understanding the problem phenomenon . The second section dealt with the sizes and types of waste in Iraq after 2003 it aims explain the sizes and types of waste produced by the Iraqi civil communities using the digital tables for this purpose and to analyze these figures, the most important sources of the second section and its information are government statistics . The third section dealt with the economic feasibility of waste recycling in Iraq ,The third part aims to demonstrate the economic feasibility of the waste recycling sector in Iraq and the possibilities of profitability by analyzing this possibility and trying to prove that, the most important sources of the third part is the factual information from the field of application of small projects that are currently working in Iraq in waste recycling operations as well as lessons from successful international experiences in this sector.

Section 1 : the nature and history of the problem of waste in Iraq

The problem of waste in Iraq consists mainly of basic components, which are the waste of urban and peri-urban populations as well as the remnants of factories and farms. This problem has been greatly exacerbated during the last decades of the last century and the beginning of this century and it's become a serious problem threatening the environment in Iraq[1].

In Iraq, this phenomenon is linked to the complexity of life and civil development, the expansion of human settlements and a steady increase in population growth rates in general, the population growth rate in Iraq from 1958 to 2009 was relatively high (the growth rate in this period ranged from 3.4% to 3%)([2]).

In depth, if we want to trace the history of this phenomenon, we must return to the beginning of the Ottoman rule of Iraq (the middle of the sixteenth century) specifically in 1534, as major cities began to form according to the measurements of that time, and the Ottoman states of Iraq were formed from three states: Baghdad, Mosul and Basra, and each state is a city with a high population concentration at that time, and we can say, that these cities were the oldest generation of waste in Iraq in the modern era, through what these three cities generated from the waste of the daily lives of the population, and the evidence is that the Ottoman administration has established municipal service units to collect and remove these wastes from these cities and move them out, and special landfills were allocated to those waste. Taking into consideration that the wastes in that period were not highly diversified nor large quantities, as it consisted of leftovers and some other wastes that are characterized as a natural sources and is not manufactured and don't causes any environmental pollution.

Municipal units involved in the collect and carry garbage and clean alleyways and streets were composed of laborers using primitive means consisting form Horse-drawn carts, as available at that time, and this activity was a part of the duties of the municipal council in the Ottoman era.([3]) In general, if we look at the issue from the point of view of the population, we will find that the population of Iraq from the sixteenth century to the last quarter of the nineteenth century did not exceed one million and two hundred and fifty thousand, and they are distributed according to the patterns of residence, for example, nomadic tribes constituted 35% of the population, 41% of the population were rural tribes and 24% of the population were urban dwellers. ([4])According to this population concentration, we can see that the urban population in that period did not represent a large proportion of the total population in Iraq, noting that the lifestyle and consumption pattern at that time is characterized as non-generation of waste and does not constitute a cause of pollution or source of raw materials. In addition, waste recycling techniques were not known at that time.

[1] for more details(Ahmed, Sayed Ashour, Environmental pollution in the Arab world and the reality of treatment,
. International Printing Company, Cairo, First Edition, 2006/ Municipalities and Public Works / Directorate of Public Municipalities / Environment Department, Annual Environment and Pollution Report ,2009)

[2] National Population Policy Committee, Analysis of the Demographic Situation in Iraq 2012, Baghdad, June 2012, p. 41

[3] Abdul Azim Abbas Nassar, The Municipalities of Iraq in the Ottoman Period, Al-Haydari Library, Unknown Place of Printing, 2005, First Edition, pp. 148-150

[4] Mohammed slman ,population of Iraq demographic study, Bulletin of the Oxford University Institution of Statistics,Vol.20,NO.4,1958

We move sequentially to the period followed the Ottoman rule of Iraq, the period of British occupation of Iraq after 1918, where the circumstances changed radically after this year, especially, after the entry of British troops into Iraqi cities including the three largest cities (Baghdad, Mosul and Basra). By the end of the second decade of the twentieth century, the patterns of life in Iraq had changed radically with its openness on Western culture in general and English in particular, specifically after the submission of Iraq under British mandate. In this period, the consumer pattern moved to a wider commodity lists and Iraqis looked to new types of goods and headed towards purchasing and consumption its, this has greatly increased the quantities of waste in Iraqi cities, taking into account that the proportion of the population began growing, and the proportion of urban residents increased compared with the other patterns of life in the countryside and the nomads, where the proportion of urban population exceeds 25% of the total population of Iraq and this continued until the beginning of the fifties of the last century.([1])

Hence, this population growth in Iraq led to produce the waste in huge quantities and the government departments began over five decades to deal with it unevenly, depending on the outputs of the general situation economically and politically but the process was not within the recycling strategies, but it was a part of collecting and loading the waste and then landfill it in customized areas, and various means have been used in terms of their efficiency. Those processes included collecting and loading the waste and then landfill it under many layers of soil to ensure that they do not pollute the environment as planned, but the reality of the case included several cases of massive violations of the waste landfill rules and regulations, especially with the increasing quantity of waste associated with population growth in major cities such as Baghdad. It went on like this for a long time without mentioning a real problem, but at first sight, by observing the data of Table No.(1), which shows the general population growth in Iraq after the seventies of the last century and with the increasing rates of oil wealth and nationalization of oil by the Iraqi government at that time and the high rates of consumer spending, we can clearly see the seriousness of the waste problem.

Table (1) The population of Iraq from 1918 to 2017 per ten years (million people)•

YEAR	Population
1917	2.421
1927	2.953
1937	3.845
1947	4.816
1957	6.398
1967	8.487
1977	12
1987	18
1997	22
2007	31.22
2017	37.2

Source: National Population Policy Committee, Iraq Demographic Analysis 2012, Baghdad, June 2012, pp. 22-25.

Data.worldbank.org.population.iraq.19may2018

We can follow the data in Table (2), which shows the percentages of urban residents by governorates after the seventies of the last century, which confirms what we have talked about earlier that the problem of waste began seriously in this time period due to high levels of income and increased the tendency of consumption significantly and this has been one of the main causes of high quantities of waste in the cities and urban gatherings. These rates declined after 1991 after the Iraqi economy was subjected to the economic sanctions after the Second Gulf War, and continued to decline until the US occupation of Iraq in 2003. After the change of the Iraqi political system, the level of per capita income increased significantly, which led to an increase in consumption and consequently the waste problem has grown. Here, this phenomenon has taken a new direction that we will address it in the second part of this study, which illustrates the picture of this phenomenon in its current form, on which our economic calculations will be based on the economics of waste recycling, which is the main subject of this study.

[1]Hanna Batato, Iraq and the Revolutionary Movements, Beirut 1976, p.

• Until 1947, the population data were mere estimates. In 1947, the Iraqi state conducted the first reliable census by using foreign and Iraqi experts on this matter

Table (2) Percentage of urban population by governorates for the period from 1970 to 2009 (%)

Governorate	Percentage of urban population (%)
Baghdad	60
Babylon	50
Qadisiyah	75
Nineveh	75
Anbar	50
Diyala	50
Dhi Qar	68
Basra	80
Maysan	75
Muthanna	40
Karbala	70
Najaf	75
Salahaddin	45
Kirkuk	80
Wasit	70
Erbil	70
Dohuk	70
Sulaymaniyah	70

Source: National Population Policy Committee, Iraq Demographic Analysis 2012, Baghdad, June 2012, p. 91.

Section 2 : sizes and types of waste in Iraq after 2003

In this phase of the phenomenon we will deal with the sizes and types of waste resulting from the economic behavior of the Iraqi society after 2003 in terms of types and sizes of consumption and the components of the commodity list which became a part of the normal daily pattern of the Iraqi consumer after 2003 and the subsequent years of the American occupation of Iraq and the beginning of the political and governmental formation of the country and not only the wide economic openness, but also the anarchism at the global economic level. As noted in Table No.(1), the population of Iraq after 1997 witnessed a significant increase, the population of Iraq at that time reached 22 million, according to official estimates, and in 2003, Iraq's population was 27 million, according to the same estimates. Here we can note that the population of Iraq has doubled more than a dozen times during the twentieth century and the first decade of the twenty-first century.([1])

First, we must list the main types of waste that generated by the civil activities in Iraq, which are not very different from the relevant international classifications. We will list these items in table No.(4) according to the types and sources generated in the current situation in order to observe this diversity. The vast amounts can be seen with 37 million people living mainly in cities and other gatherings. The real size of the problem can be realized by observing the quantity of waste removed by the municipal units from each governorate in Iraq. As shown in table No.(4) of the waste volumes for each governorate by its categories, we note the huge amounts of waste. There are more than 14 million tons per year of waste in Iraq, with a daily rate of 93308 tons, removed from all governorates of Iraq and a high concentration of Baghdad governorate with its municipality (the center of the capital and its outskirts). The Municipality of Baghdad registers (4118259) tons per year and the outskirts of Baghdad governorate (321237) tons annually with a daily rate of (11282) tons in the center and (880) tons in the outskirts of Baghdad governorate. These rates are similar to the quantities of waste in many cities in the world, and may exceed it, so give us the actual path of this phenomenon in order to discuss the economic feasibility of recycling activities for possible waste according to these calculations, which will be address in the next part of this study.

[1] National Population Policy Committee, Analysis of the Demographic Situation in Iraq 2012, Baghdad, June 2012, p. 24

Table (3) Wastes in Iraq according to the types and sources that generate them

Type	Source	Waste components
House waste	buildings and other types of housing	Food, cardboard, plastics, textiles, leather, garden waste, wood, glass, metals, ash, special waste, electronic devices, batteries, oils, tires, hazardous waste.
Industrial	Light, heavy, manufacturing, industrial sites, chemical plants, power plants	Destruction waste, Food stuffs, Packaging, Household waste products, Non-standard products, Construction waste
Commercial	Stores, hotels, restaurants, markets, office buildings	Paper, Cardboard, Plastic, Wood, Food residues, Glass, Metals
Institutional	Schools, prisons, governmental centers	Such as commercial type
Hospitals	Health care centers, hospitals, medical clinics, maternity centers	Non-hazardous waste consisting of paper and food
Rubble of the buildings	New construction sites, road repair, restoration sites, destruction of buildings	Wood, Metals, Concrete
Waste of municipal services	Street cleaning, parks, beaches, recreational areas, water treatment sites	Street cleaning, garden waste, general waste from parks and recreational areas
Agricultural waste	Orchards, farms, dairy plants, waste of animal slaughter	Musty food and agricultural waste

Source: Lqaa Karim Khudair, Analytical Study of the Municipal Services Sector and its Impact on the Environmental Aspects in Iraq's Governorates for the Year 2015, Al-Ustad Magazine, Issue of the Fifth Scientific Conference of 2017, Baghdad, 2017, p. 321.

Table No.(4)

Quantity of waste removed according to the Governorate for 2015*

Governorate	Number of Municipal Units	Ordinary Waste (Ton / Year)	Rubble (destruction and construction waste) tons / year	Scrap (ton / year)	Quantity of removed waste (ton / year)**	Quantity of removed waste (ton / day)
Mosul	--	--				
Kirkuk	9	369343	7482	328	377155	1033
Diyala	22	322550	26243	5511	354306	970
Anbar	--	--				
Baghdad Municipality	14	3495860	538890	38507	4118259	11282
The outskirts of Baghdad	16	306016	15001	255	321237	880
Babylon	16	259186	73182	14928	347298	951
Karbala	7	344560	214255	4818	563633	1544
Wasit	17	395796	61320	6898	364015	997
Salahaddin	12	243126	22520	3832	269480	738
Najaf	9	615353	285101	1642	902098	2471
Qadisiyah	15	299300	134247	18797	452345	1239
Muthanna	11	163739	184982	255	348977	956
Dhi Qar	20	555639	60663	10694	626997	1717
Maysan	15	507167	126742	11643	645284	1767
Basra	15	1198696	433547	15403	1647647	4514
Kurdistan Region	198	8976262	2228909	133517	11338698	31065
Dohuk						

Al-Sulaimaniya	39	620427	2336	4599	627362	1718
Erbil	70	949657	84534	53509	1087700	2980
Total	62	1085072	202246	8395	1295714	2549
Iraq's total	171	2655156	289080	66503	3010739	8248

*Except Mosul and Anbar governorates due to their special circumstances.

** Means regular waste such as (Waste and scrap and construction debris).

Source: Department of Environmental Statistics, Iraq Environmental Statistics, 2015Republic of Iraq, Ministry of Planning, Central Bureau of Statistics, October 2015.

Can be perspective from the data contained in the tables (3-4) type of materials contained in waste produced by cities and gatherings in Iraq by reviewing the contents of tables (5-6) below. Where we can see the basic components and the rates of change in two decades extend to periods before 2003 and after 2003 till 2017, we note that the waste consists of (food, cardboard, glass, plastic, food wrappers, metal, textiles of all kinds, diapers, garden waste, wood, rubber, leather and other items). Therefore, we can see clearly the great development in the volume of waste as mentioned earlier in this study. For example, the rate of growth in aluminum cans was 300% which higher than the base year in 1988 and the other types also had growth rates higher than 400% as shown in below tables (5-6). We note also, that other types were not available in 1988 within the generated waste from the consumption processes in the cities and other civil urban gatherings which are smaller in terms of urbanization and population such as villages and suburbs.

Table (5) Main components of waste in Iraqi cities and its weight proportions

No.	Components	Range (weight ratio)	Percentage change from 1988 to 2017	General Average %
1	Food waste	20 – 80	400	68.17
2	Paper and cardboard	3.3 - 10	303	9.6
3	glass	1.8- 8.2	455	2.61
4	Plastic and nylon	2.0- 7.6	380	5.29
5	Aluminum cans	1.4- 4.2	300	2.27
6	Food wrappers	1.0- 3.8	271	1.65
7	Metals	0.5 -2.1	420	0.88
8	Textiles of all kinds	2.8- 12	428	2.01
9	Diapers	0- 17	400	3.47
10	Residues of gardens	0- 4.8	200	1.13
11	Wood	1.1- 2.8	254	0.85
12	Rubber	0.7- 2.5	357	1.0
13	Leather materials	0.8-3.4	425	0.48
14	Other things (not mentioned above)	0- 3.3	200	0.59

Source: Republic of Iraq, Ministry of Planning, Central Bureau of Statistics, Department of Environment Statistics, Iraq Environmental Statistics for 2016, October 2016.

Table (6) The changed of the composition of solid waste between 1988 and 2017 in Iraqi cities

No.	Components	1988 (%)	2017 (%)
1	Food waste	81.0	68.17
2	Paper and cardboard	5.0	9.6
3	glass	1.0	2.3
4	Plastic and nylon	3.0	5.29
5	Food wrappers	not available	1.42
6	Aluminum cans	not available	1.4
7	Metals	5.2	0.98
8	Textiles of all kinds	1.4	5.09
9	Diapers	not available	1.9

10	Residues of gardens	2.4	0.93
11	Wood	0.4	0.85
12	Rubber	not available	1.0
13	Leather materials	0.2	0.48
14	Other things	0.4	0.59

Source: Republic of Iraq, Ministry of Planning, Central Bureau of Statistics, Department of Environment Statistics, Iraq Environmental Statistics for 2016, October 2016.

Section 3: The economic feasibility of waste recycling in Iraq

The concept of economic feasibility has many frameworks, the most important of them is the direct profit with digital accounts of the funds that can be earned when conducting any profitable economic activity. Other trends of feasibility relate to standards that going to other paths, the most important of them is the sustainable development of natural resources and preserving the natural resources of the environment from destruction.

The study will address the economic standard, which is to achieve profits for investors and businessmen in the field of recycling assumed in Iraq and the study showed without doubt the existence of the main supplier of this type of works, which is the huge quantities of waste that can be recycled in order to make the Iraqi economy among the economies that depend on the recycling of waste according to successful international models such as recycling model in Amsterdam([1]), Others in Europe and other global regions.

First, we will address the direct economic feasibility of waste recycling processes, which can be practically done by the Iraqi economy for most of the waste in Iraqi cities and turn it into products that can be used as raw materials or intermediate inputs in profitable economic activities. As we have seen from the data in Table (4) that Iraq produces (14349414) tons of waste of various kinds, and the waste that can be recycled represents more than (25%) of this amount, while the rest can be landfill and the other half can be used as profitable uses. The estimated cost of collecting all kinds of waste in Iraq per ton is about 80 US dollars. With the estimated cost of sorting and recycling for most types of waste such as aluminum and other light metals, the cost per ton can range from 300 to 500 US dollars, taking into consideration, the laborers costs and the equipment used[2]. These figures can be compared to those of developed countries in the field of waste recycling such as Sweden, Germany, China, the United States and the Netherlands([3]). From this point of view, and the basis of the economic analysis of the economic feasibility of the possibility of establishing a profit sector for the waste recycling in Iraq, we see that it is a profitable sector, which can be accommodate more than 60 thousand of technical and non-technical workers according to the estimates of the Iraqi Ministry of Planning for available labor, which can take its course to such a sector([4]), and according to the quantities of waste generated annually in Iraq and the density of labors required in the production patterns in the sectors of waste recycling in the activities of final sorting and recycling. This is a matter of direct feasibility, which can be measured in terms of financial measures.

The other type of profit is the indirect profit or so-called social profit, which can be measured by several criteria, most important of them the conservation of natural resources and use them more than once in economic processes([5]). If we apply this feasibility criterion to the Iraqi case, we should know the source of the waste as a commodity and import source, because most of the goods that produce the total waste in Iraq are originally imported and its import costs are covered by

[1] The city of Amsterdam and its municipality launched a project with a high level of success, which its economy be based on the waste recycling, and this meaning (not throw anything), but the recycling of everything from waste even the remaining ash from the burning of waste which is retained from the process of producing electricity or any other burning processes, where ash contains quantities of minerals that can be used. From this example, we can conceive the model of economy based on waste recycling of the city of Amsterdam which is still growing to confront activities that do not correspond to this idea, where these activities are called linear economy, which does not depend on the system of waste recycling.

[2] These costs were derived from interviews with owners of small and individual waste recycling projects in Iraq, and these costs could change to better figures and more economically feasible when these projects in this field shift to large scale projects.

[3] Eurostat (2005). Waste Generated and Treated in Europe. Data 1995-2003, European Commission -Eurostat, Luxemburg. 131 p.

[4]For more information Ministry of Planning, Central Bureau of Statistics, Statistical Series 2016, population statistics and labor forces

5For more information on the indirect economic profitability of recycling processes see: Salah Mahdi Abbas, Analysis of the Problem of Waste Transport in Baghdad Using Linear Programming, Unpublished Master Thesis, Faculty of Management and Economics, Baghdad University

The contribution of thermal waste treatment to climate change mitigation, air quality and resource management]. For: Interessengemeinschaft der Betreiber Thermischer Abfallbehandlungsanlagen in Deutschland (ITAD). Öko-Institut, Darmstadt 2002 [In German].

the oil export revenues. Therefore, the orderly waste recycling will reduce the financial encumbrance on the Iraqi economy, as well as reduce the impact of pollution, especially when throwing non-biodegradable wastes such as plastic and other waste([1]), as these wastes are not biodegradable for very long periods of time. Therefore, waste recycling processes will save the Iraqi environment from the potential hazardous pollution of contaminated waste types and preserve the Iraqi natural resources (water and soil) from destruction. Therefore, the development of the waste recycling sector achieves economic and social profits, especially, if the facilities were provided for businessmen to invest in this filed, as discussed earlier in this study. Also, should be noted that it is not possible to neglect the effect of cleaning the environment of waste on public health, because this will affect the level of productivity and labor activity that can be built in the future and building a successful developmental track with significant impact on the country within sustainable development framework, as well as, the backward and forward linkages of the recycling sector with other economic sectors as raw material supplier as well as the recycling sector inputs from other sectors in the context of productive reliability in the case of flourishing processes of the recycling sector, then it is a compensatory feasibility and the feasibility of sustainable development.

Conclusion

Finally, concluding phrases must be place within the framework of the conclusion and proposals related to the subject of the study.

The study concluded the following:

The problem of increasing waste production and non-recycling it, is a dangerous problem due to the high rates of population growth and the increased consumption processes which generating waste in huge quantities and this is a major cause of environmental pollution.

There is no clear system for handling and recycling large amounts of waste, but the efforts are limited in collecting waste and landfill it.

The Iraqi consumer is not concerned with the processes of waste recycling because of the absence of an integrated system that gives the consumer a key role in the processes of waste recycling, so the consumer acts very random in dealing with the waste generated by the activities of his daily life and this complicates the problem more.

The unscientific dealings with waste and the use of means belong to the past centuries, lead to the waste of raw materials contained in the wastes, which can be used through recycling it for many times, and the second direction of waste is the pollution of the forces of nature through the processes of landfill the waste underground and this generate gas emissions, as well as, waste dumped in rivers. As well as, the financial waste of oil sales, which offset by more imports of consumer goods and raw materials that can be offset by waste recycling processes.

The missed opportunities from the Iraqi economy because of non-recycling of waste in a scientific and systematic form, is represented by the inability to compensate the lost initial resources in the waste and the loss of the labor opportunities and the intertwining of economic sectors and the loss of sustainable development opportunities by making the economy circular not linear in use the resources of all kinds.

The study recommends:

The government should provide a strategic legislative framework with a clear vision to start waste recycling operations immediately as a national goal. This framework includes legislation that encourages and motivates the national and foreign business sector to invest in this sector and the national government's permanent announcement on the profit of this sector, as well as, providing tax and financial facilities for this sector if it grows in the right direction.

Utilizing the experiences of developed countries in the field of waste recycling such as Sweden, Germany, Holland and China and attracting businessmen from these countries to invest in Iraq.

Providing governmental funding to support this sector and provide all the necessary supplies to maintain its sustainability because of its great importance of the preservation of the environment.

[1] There are a total of 73 landfill sites designed and approved by environmental protection departments and 163 sites not designed and approved by environmental protection departments

Establishing of a national institute specialized in the management of researches, studies and consulting in the field of innovation in waste recycling processes and sustainable development and the provision of databases on the growth of waste problem and its danger to public life, both healthily and economically.

Adopting a national public opinion campaign to demonstrate the extent and seriousness of the continuation of the absence of an integrated sector for the recycling according to scientific visions and try to make the citizens and institutions an active part in the system of waste recycling.

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