



SOLID WASTE AND ITS IMPACT ON THE ENVIRONMENT IN OMDURMAN

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Abstrak

The research dealt with solid waste and its impact on the environment in Omdurman locality and it is considered a modern and contemporary subject. The aim of the research is to identify the methods related to waste, environmental pollution and to try to search for qualitative and planning criteria for the definition of solid waste in Omdurman. The researcher used several approaches to suit the nature of the research, including the historical approach to tracking the solid waste stages in Omdurman. The descriptive approach was used to describe the natural and human phenomena, as well as the analytical statistical approach (spss) to collect, arrange, analyze and interpret the data. With waste in general and solid waste in particular. The research has reached a number of results, the most important of which is: The increasing population growth has a direct relationship to increase the quantity of waste. The absence of awareness and environmental culture in the population led to the aggravation of this problem, resulted in the accumulation of waste, and spread in the streets, fields and tents throughout the study area. The absence of a private sector capable of contributing to the service of waste, where all experiences with the private sector proved their failure to achieve real support for cleaning bodies. Poor planning in the infrastructure of roads inside and outside the local.

Keywords:

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1. INTRODUCTION

The first stages of human life on the surface of the earth is to provide shelter, food and clothing, and since it was found on the surface of the earth seeks to provide the greatest comfort and luxury.

Therefore, man remained in constant conflict with the nature surrounding him in all its forms in order to survive and continue life on earth. The conflict between man and the natural environment has passed through generations as man at the beginning of his creation used simple tools in his dealings with nature. In the context of civilizational progress, the growth of human capabilities and the gradual evolution throughout the

ages, the devastating effects on the environment have appeared on the one hand, and man himself on the other. The increase in the population, high standard of living, industrial and agricultural progress and the lack of appropriate methods of collecting, transporting and treating solid waste have led to a huge increase in the amount of waste and thus pollution of the environment elements of land, water, air and depletion of natural resources in many parts of the world. All countries of the world are vital to maintaining public health and safety.

1. Research problem:

The problem of solid waste in the Omdurman municipality has been particularly acute in recent times due to:

1- The speed of accumulation of solid waste is higher than the speed of decomposition.

2. The use of glass and the production of industrial products that are non-natural and non-degradable such as plastic, synthetic rubber, metals and glass. These products are not exploited or decomposed by living organisms and the production of such non-degradable wastes has led to the rapid accumulation of these wastes, making them a severe problem requiring treatment.

2. hypotheses research

1 - Failure to respect the technical and regulatory standards used in the disposal of solid waste has exacerbated the problem of waste with the lack of environmental culture in the population and those responsible for this matter have greatly affected their management.

2 - The methods of collecting solid waste from houses or factories and various facilities and reached the containers and containers to the landfill and then transferred to the landfill of the main access to the containers have an impact on the environmental pollution resulting from these wastes.

3 - The large population increase and the urban and industrial expansion in general within the cities and the danger resulting from these wastes and their main sources has formed a great interest in the collection of these solid waste and away from the population groups and treatment, which requires the officials to follow up the matter to protect public health and protection of the environment.

3. Research methodology:

The researcher used several approaches in this research so that he can reach the

required results, the most important of which are:

- Descriptive Approach: The researcher used this method to highlight the situation of the spread of waste in the area covered by the study using several research tools including observation and accurate description and linkage to the natural and human components of the study area, reinforced by photographs.

- The historical approach: is used to track the historical development of population growth and follow the steps taken by the competent bodies to solve the problem of waste.

- Quantitative Statistical Methodology: It is used to collect information and data in the form of statistical figures and tables for analysis and use in order to reach the results and achieve the hypotheses.

- Environmental approach: This approach demonstrates the ability of man to choose what suits him as it affects the environment as it is affected, including highlighting the forms of human adaptation to the natural environment (Salah, 2011, p. 63). And its natural environment by clarifying the subordination of the person of the study area to the conditions of the natural environment and then to highlight those conditions and follow up their role in the spread of waste such as wind and rain.

- Behavioral approach: Use this approach because it focuses on the guidance, motivation and response of individuals and groups and the impact of all this on their behavior, based on two main principles: (i) Human behavior is a key factor in the structure of societies and the organization of populations and (ii) Sequentially determine the steps in the nature of human behavior in dealing with the environment in order to organize the place (Awad, 2011, p. 71). This approach was used to identify the

cultural role of the population in dealing with waste.

4. Waste concept:

The waste language: In: Nafah denies Nfia and Nffohh and banished and expelled and beyond. And the wind denied the dust and denied exile by opening, its framework is said to be denied the thing is not a waste and negation if it was rejected and all the rest is denied it is said of the waste of the people and their deeds, ie, their descendants (Abdeljawad, 1997, p. 27).

Waste is defined as the residues of domestic, agricultural, extractive, transformational and productive activities, ie all dispossessed dispossessed in a place, and leaving them to harm public health and safety (Essam, 2006, p. 2).

The increase in the urban population, the rise in the standard of living, and the industrial, agricultural and service progress have led to an increase in the amount of waste left by the population in a way that is difficult to get rid of. The estimated average value produced per capita per day ranges between (2-3) kg depending on the degree of industrialization, urbanization, purchasing power, community culture and other factors and factors.

Waste and garbage are those unwanted and undesirable things that no one needs. For the government, waste and garbage are a big responsibility if they do not manage well and get rid of them. They expose themselves to political and social problems, especially if the garbage is stacked in roads, streets, squares and parks. To the residents around or close to it, harms the eyes, harms the visitors, children and animals, expels tourists, restricts their entry into the area, disrupts traffic, pollutes waterways and other apparent and hidden problems.

(Ibid., P.

4. The concept of solid waste

It is the accumulation of solid state materials resulting from different human activities, which are of the same size and occupy space. This must always be done to find places to get rid of these wastes (Ghreibah and Farhan 2003, p. 16).

5. Classification of solid waste

Solid wastes can be classified by their nature, such as organic and inorganic waste, which can be rotting, non-corrosive, incinerated and incinerated, or by sources such as municipal waste (industrial, household, commercial, office) Road waste, demolition and construction waste, mining waste, agricultural waste, wastewater treatment plant waste). (Safadi and Al-Dhahir, 2001, p. 22).

6. Historical background of Omdurman

Omdurman is a historical city that dates back to the Age of Anj according to historical accounts, the capital of the Mahdia state and is now the national capital. It has many historical, historical and national monuments such as Al-Tabiya, Abdul Qayyum Gate, Sports House, Imam Al-Mahdi Dome, Officers - Al-Marikh Club - Al Hilal Club - Omdurman Scientific Institute - Sudanese Radio - TV Republic of Sudan - National Theater.



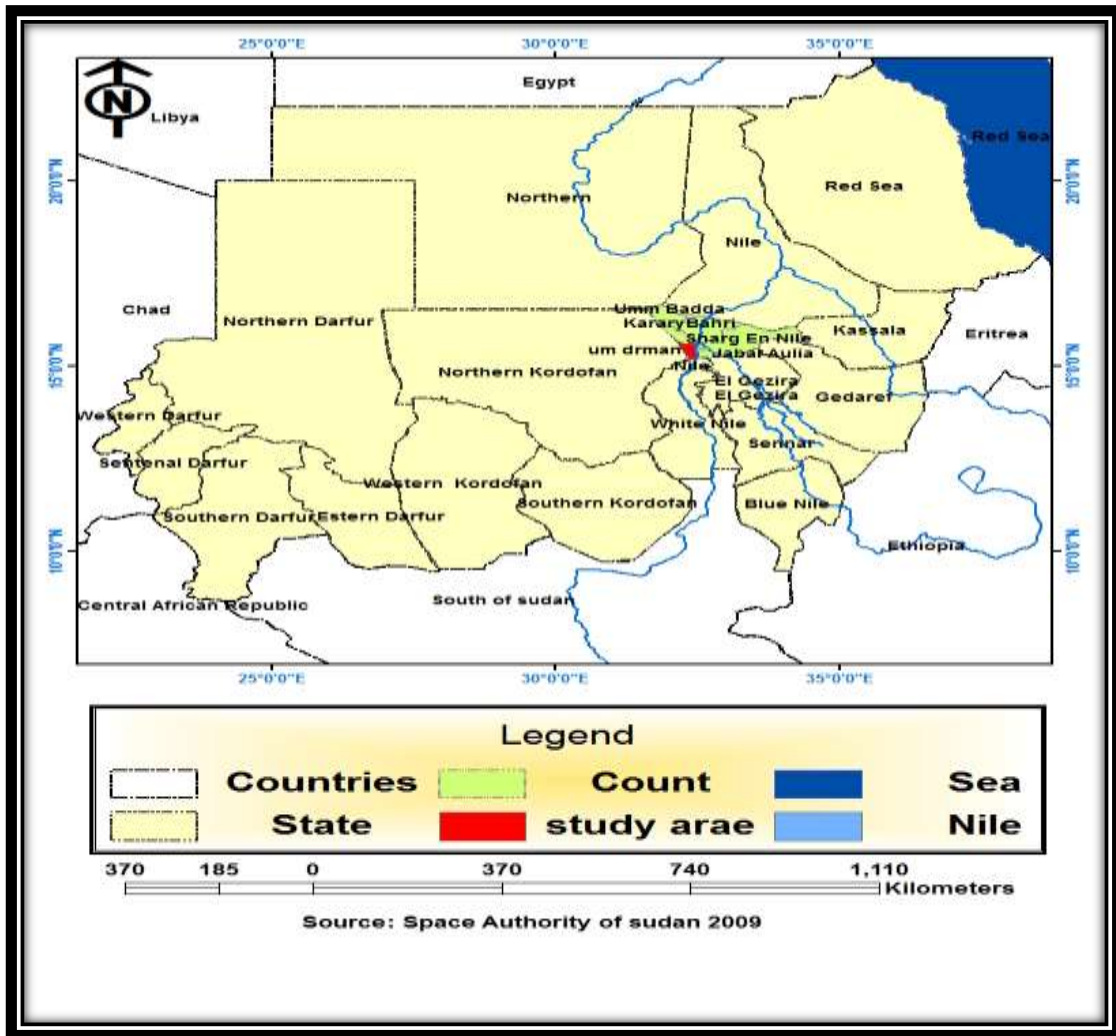
A picture showing the local Omdurman

5. Astronomical location of Omdurman
The town of Omdurman is located

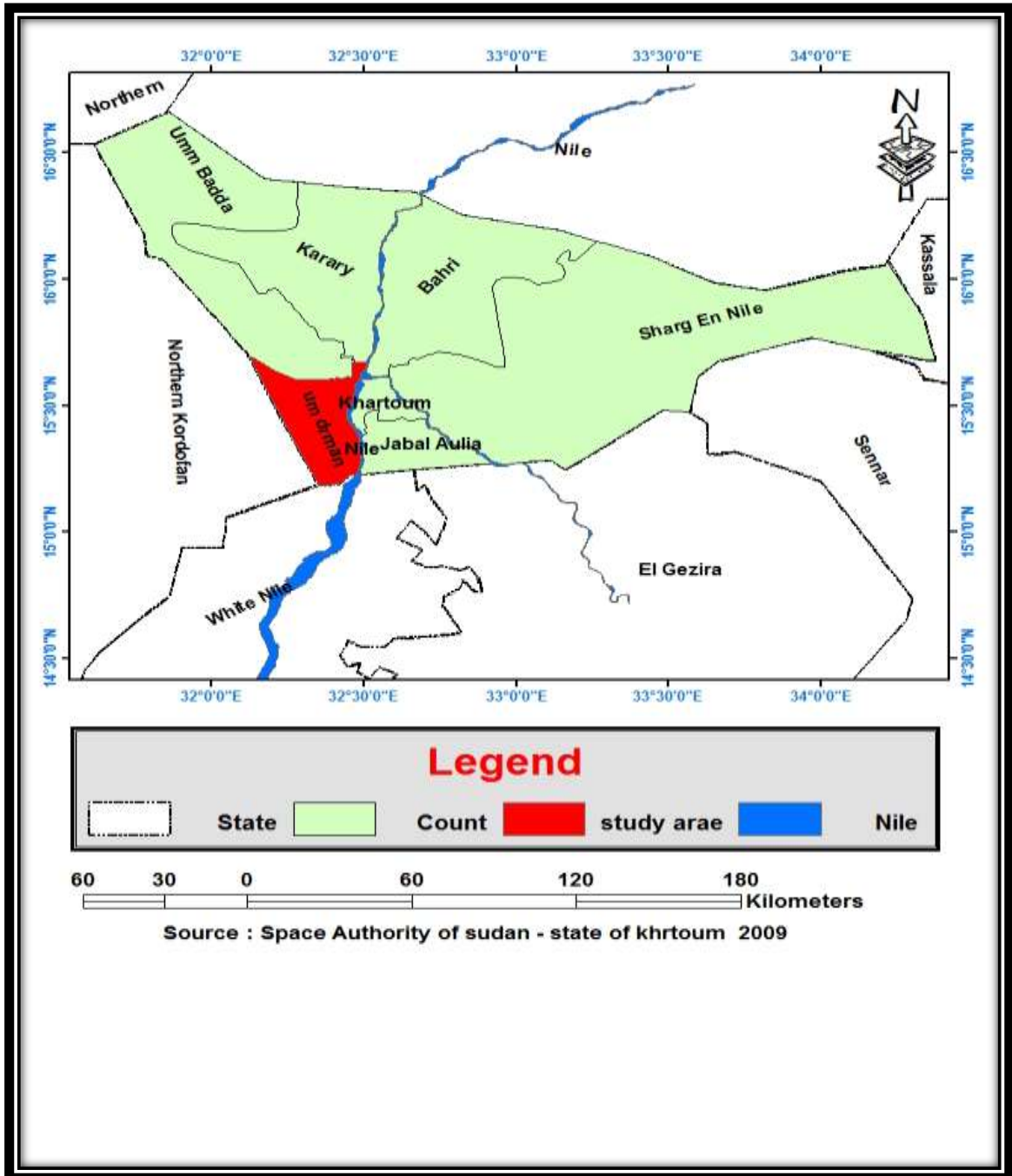
between the widths 37-31, 36.5 and 32 north, and between the longitude lines 11.5 - 15, 39.5 - 16 East on the West Bank of the White Nile, and the Nile is bordered by a local north and the western part of the town of Omdeda.

6. The geographical location of Omdurman

In terms of geographical location bounded on the north by the locality of Kerry and to the south by the White Nile State, to the east bordered by the White Nile and the Nile River and the West by the locality of Omdeda. See map (1) and (2).



Map (1) shows the study area in Sudan



Map (2) illustrates the study area in Khartoum State

7. local area Omdurman

The area of the study area is about (895) km², which is the fifth in size, accounting for 4% of the total area of the state of Khartoum.

(16)administrative units including four rural units and (12) urban units and this division represents the political division of the local and to facilitate the collection and transport and follow-up, the local cleaning body divided into six sectors as per the table below.

8. administrative division in Omdurman district

Table (1) shows the number of administrative units in the study area

Service Coverage %	Type of sector	Names of administrative units	Number of administrative units	Sector Name
100%	Residential Housing	The Dnubaoy +District The Arabs	2	North
100%	Residential Housing	Supplied + Abuanjh+ engineers	3	South
100%	commercial	Omdurman Market	1	Omdurman Market
100%	Commercial and industrial	Industries + Central+ People	3	western
3 7%	residential rural	Abu Saad northSouth + Afattaa hab	3	Abu Saad
2.4%	Rural housing	Unity + Peace + signs + elite	4	the countryside

Source: Omdurman Cleaning Authority, 2017.

Table (2) shows the basic information in local.

Source: Fieldwork, 2017.

Item	number
Number of institutions	368
Number of main and subsidiary streets	172
Number of Banks	103
Number of areas and fields	81
Fowl breeding sites	411

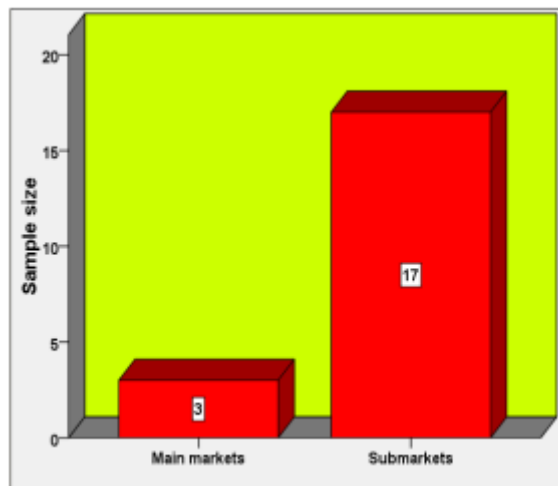


Figure (1) shows the number of markets in Omdurman

Figure (1) shows that the number of markets in Omdurman (20) market is divided into (3) main markets and (17) secondary markets.

9. Solid waste in Omdurman district. Solid waste is defined as solid materials and materials that have become irrelevant to their owners and want to be disposed of or abandoned. The National Environmental Health Act defines them as solid wastes that are undesirable resulting from human activity in housing, factories, public places or animal pens.

The accumulation of solid waste in cities and not properly disposed of in accordance with environmental requirements entails a number of health and environmental risks, the most important of which are the emission of unpleasant odors and the breeding of flies and other vector diseases such as cockroaches and rodents, causing diseases such as diarrhea, eye diseases, pollution of soil, air, water, fire and the spread of stray animals Infectious diseases in addition to what can be caused by harmful effects of aesthetic values.

Local Omdurman is the second largest local municipality in Khartoum state in terms of daily discharge of waste. The estimated number of daily roles is estimated at 250 (1000 tons per day). This quantity does not have the chance of transportation daily due to insufficient transport of waste. % To 75% at best. (Omdurman Cleaning Authority, 2017.)



Photos showing how to collect solid waste in Omdurman.

Table 3 shows the total number of homes serviced and the proportion of the service

Sector Name	Number of total houses	Number of houses serviced	Coverage ratio
North	6117	6117	100%
South	7874	7874	100%

Total	13991	13991	100%
Urban			
Abu Saad	34103	12603	37%
Southern countryside	46906	1108	2.4%
Rural areas	81009	13711	17%

Source: Omdurman Cleaning Authority, 2017

Method of delivery of local waste collection and transport service:

1-Markets: The markets represent 25% of the local administrative units and 33% of the waste disposed of locally. These are major shopping centers for each state and include many activities, which led to the containment of their waste on all kinds of organic waste, plastic, paper and industrial wastes.

The service of collecting, preserving and transporting waste in the market is done in two ways

The use of containers of different sizes for the temporary storage of waste and the transfer thereof to the intermediate station or the landfill through either roller or compressors

Collect waste from areas of excreta in the markets by manual handlers and then transfer them to the intermediate station or landfill by different types of waste trucks (compressors, skips, tractors)

The service is offered throughout the day via 3 shifts, focusing on evening shifts to avoid congestion that hinders collection and transportation.

2-Housing units: The service is provided through the combination of a house to the house and the main streets and branch rate of visit or two visits to the neighborhood in a week in the urban units covered by the service with the work of some treatments in

the form of campaigns in case of accumulation of waste due to lack or weakness of the implementation of the units units not covered by the service Or a lack of mechanisms for the transfer of waste, the collection and transfer of waste through campaigns that have been completed in coordination with the People's Committees or other civil society organizations or facades.

3- Sovereign and main streets. Waste is collected from one to three times a day, with manual labor being ensured

4-Estimated amounts of logging waste shall be transferred from the main roads, the main roads, the subways and the lanes by means of bulldozers or tractors

5-A special service shall be provided for the collection and transport of wastes of enterprises and shops with a high discharge from waste through a contract with the Commission in a circular commensurate with the size of the waste and the type of waste in various waste vehicles.

6-The negative effects of the accumulation of waste on the markets and residential sectors such as the breeding of flies and insects through a team of specialists in the field of pest control focusing on the flies through the use of different chemical control methods using pesticides or mechanical by inspecting the location of flies larvae, With the Anti-Malaria Department to conduct spraying campaigns in the market and public places when the emergence of high density of flying flies.

7 - the program of removing dust and cleaning streets The work of street cleaning depends on the basic wage workers on the basis of low wages and the absence of any other material return (for example, collecting scrap and scouring cleaners) and the nature of work classified as hard work. The number of workers currently 14 workers only They work only five days a week to clean the local streets of Omdurman. (Source: Omdurman, 2017.(Source: Omdurman Cleaning Authority, 2017)



Cleaning the street by workers and lifting the rubble (Bobcat and clogs). The work of street cleaner depends on the availability of equipment and the maintenance of part of the equipment in the warehouses to ensure continuity of work, below is a table showing the type of equipment and quantities of 100 workers.

Table 4 shows manual hygiene equipment.



Type	Quantity	Need
Brushes	100	consumed per month
shovel	50	consumed every three months
Wheelbarrow	30	consumed every six months
Reflective jacket	100	consumes every three months
A traffic cone	40	consumes every three months

Source: Omdurman Cleaning Authority, 2017



Photos showing solid waste in Omdurman and how to deal with it.

1. activating the work of the sector
First way of action: remove the dust from the street by the trailer and the removal of rubble (skips + buck loader) evening work in preparation for the work of cleaning and dust removal manually by workers.

Table (5): Current Situation of Human Resources, Mechanisms and Deficits.

Moderator s	Strollers		Number of workers		Number of synagogue workers		Supervisors	
	exists	Shortage	exists	Shortage	exists	Shortage	exists	Shortage
mdurman Market	8	-	45	-	86	25	6	3
western	12	2	34	6	90	45	9	5
North	11	-	70	-	17	27	4	11
South	13	-	60	-	27	30	5	12
almuhand isin	7	-	43	-	16	16	1	8
Abu Saad	13	15	60	45	30	30	5	27
alriyf	5	10	15	45	14	20	2	15
total of locality	69	27	327	96	280	193	32	81

Source: Omdurman Cleaning Authority, 2017.

Table 6: Analysis of the current status of collection and transport vehicles in terms of capacity:

Source: Omdurman Cleaning Authority, 2017.

Type of vehicle	Number of vehicle	Capacity in ton	Quantity of waste in tons per floor
Tata (S) tractor	13	0.5	6.5
Chan Chan	3	2	6
Jack dump truck	3	2	6
Hino dump	7	5	35
Tata dump	7	4	28
Great pressure	20	7	140
Small pressure	5	4	20
total of vehicles	73		265.5
Roll Jack	4	1 ton × 50 container	50
Mitsubishi Roll	7	4 tons × 25 container	100
Wholesale for roller	11		150
Wholesale	84		421.5

4. RESULTS

The characteristics of the natural characteristics of the study area contribute to increasing the problem of waste, which leads to poor drainage of the rainwater, the melting of waste contents and pollution of water and soil sources.

2 - Growing population growth has a direct relationship to increase the amount of waste.

3 - Lack of awareness and environmental culture in the population led to the aggravation of this problem and resulted in the accumulation of waste and spread in the streets and fields and tents throughout the study area.

4 - Non-payment of fees from the beneficiaries for the collection and transfer of waste caused the lack of maintenance of the mechanisms, which affected the transfer process.

5 - Frequent failures in the mechanical equipment for the final disposal in the collection stations and dumps led to waste dispersal and accumulation, which leads to the emission of unpleasant odors and the breeding of flies and rodents.

6 - Shortening the authorities responsible for cleanliness in the study area and the lack of financial possibilities have led to a difference in the level of services between the neighborhoods of the region and its environs.

7 - The use of a single method of disposal of waste collection without sorting reduced the possibility of economic benefit from waste and recycling.

8 - Urban expansion led to the near dumps of residential and random areas in addition to the compensation of the implementation of the re-planning of informal areas in the region.

9- The weakness of wages for all categories (workers, drivers, supervisors, etc.) led to negative behavior on collection and transportation operations.

10. Lack of safety tools for waste collection workers for poor budget.

11 - The capacity of the intermediate station currently does not absorb the amount of waste produced in the three municipalities.

12 - The length of waiting for garbage collection vehicles in front of the intermediate station leads to a decrease in the number of roles performed daily.

13 - The absence of a private sector able to contribute to the service of waste, where all the experiences with the private sector proved to fail to achieve real support for the cleaning bodies.

14. Misplanned infrastructure in and out of local roads.

18. Recommendations:

To address the problem of waste accumulation and minimize its effects, the researcher recommends the following recommendations:

1- Educating the population about the dangers of waste and its effect on the health of the environment.

2 - not to get rid of waste by traditional methods because of its negative effects on the health of citizens and the environment in the long term.

3. Provide sealed containers to prevent waste from spreading on the sides of the road and the emission of unpleasant odors during the transfer process with the obligation to transport daily.

4 - Training and rehabilitation of workers in the field of waste management.

5 - Control the work daily through inspection and follow-up and evaluation

on a permanent basis and report to the competent authorities.

6 - Follow-up and implementation of legislation and laws that prevent the burning of waste in central or near residential neighborhoods to avoid the emission of gases harmful to the health of citizens.

7. Implementation of waste sorting and recycling programs.

8. Develop methods and techniques for waste treatment and management in landfills.

9. Opening the door for international companies to introduce waste transfer technology for energy and production of methanol gas and the use of organic waste.

10. Disseminate environmental awareness in schools and universities to include proper handling of waste in school curricula.

11. Issuing environmental publications such as magazines, posters, pamphlets, publications, stories and films for children that show interest in the health of the environment with the preparation of video and audio programs in the media that increase the awareness of the citizen, using the popular committees in the neighborhoods.

12 - Increasing the green areas around the city and attention to the maintenance of rain banks and the water network.

13. Establish strict laws prohibiting the dumping of waste and punish the violating government by paying fines or imprisonment.

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