5-1 Conclusions

Khartoum MSW:

1. The value of 0.58 kg/capita/day is adopted for the year 2013 and increases at the net rate (growth rate less waste reduction rate) of the expected GDP increase of 2.7% per year. And 0.60, 0.62, 0.64, 0.66 and 0.68 kg/capita/day for years 2014, 2015, 2016, 2017 and 2018 respectively.
2. A ratio of (0.59) was obtained from 30 samples were taken from different houses in the localities of Shareq- Alneel and Khartoum for 7 consecutive days which is less than the rate adopted in 2017, then the suggested landfill areas will be satisfactory for future beyond 2018.
3. With 6,809,046 population size in year 2014, daily waste generated about 4,085 ton/day and about 1,491,181 ton/year. With population growth reaching about 7,993,851 at 2018, expected waste generation of 5,436 ton/day and about 1,984,074 ton is generated in this year.
4. The predicted values of generation rate indicated are overall average values. Variation in the waste generation rates is expected by locality, by income level and over time. Values for the population and therefore overall values for total daily waste generation are dependent on the accuracy of the population estimates.
5. With MSW Discarded density 160 kg/m^3 that concluded, daily waste volume in year 2014 was about 25,531 and 9,319,881 m^3 expected in year. Waste volume is expected to increase in 2018 to reach 33,975m^3/day and 12,400,463m^3/year.
6. Using normal compaction operation of MSW disposal into landfill to reach compaction factor 1.94 the MSW compacted density that we conclude to be 609 kg/m^3. Therefore, daily waste volume is about 6,708 m^3 in 2014 and

2,448,573 m^3 per year. In year 2018, the increase in waste volume is to be 8,926 m^3 per day and 3,257,921 m^3 per year.

7. Cumulative compacted waste volume disposal in to landfill in 5 years duration is 14,216,731 m^3 and when we compare to the area of sanitary landfills obtained in sufficient.
8. If proper recycling operation is used, it can be achieve overall waste reduction about 46%. That means this study gain a paper investment to enhance solid waste management of Khartoum state to be more efficient.

Landfill Site Selection:

1. The area for the establishment of sanitary landfills, which carry grades 5,6 about (1244.8 km^2), reaching areas represented by class 5 space (1213.8 km^2), while the regions represented by the Class 6 space (31km^2), which divided these sites into eleven districts which can be valid for the establishment of sanitary dumps in them to suit the health conditions .
2. The study resulted in a database can be a key building block for the benefit of other geographic research and studies coming, as they leave a wide range of principles and criteria for the planned waste dumps it was not there before, and that could be the next studies build on it in the selection of the most suitable landfills positions in Khartoum State
3. The Landfills sites existing in Khartoum State are not suitable except Hattab landfill because Teiba landfill located within agricultural lands and near from urban area and Abu Walidat landfill in the nearby of housing compounds and rural area .

5-2 Recommendations

Based on previous results some recommendations that would raise the solid waste management in Khartoum state level are stated below:

1. The necessity of activating the role of GIS in the field of solid waste management and environmental planning, because of the technique from a large role in facilitating the planning and selection of the best sites process, especially after being used in many countries since the last century; because of their ability to deal with a wide range of standards through give it a proper ranks, and therefore the selection of appropriate sites with a high degree of Accuracy.
2. The study recommends the need to develop legislation in the field of solid waste management, making it clear the responsibility of each party and their role in the waste management process, as well as the development of deterrent penalties for both violates the guidelines and instructions of the sound management of solid waste, whether it is a private institution or public, individual or group responsible or citizen normal.
3. Encourage industrial, commercial and professional institutions as well as citizens on the need to follow the health foundations in the waste disposal process, as well as to encourage them on the need to reduce the amount of waste generated, and re-use that can be used, and recycling; access to healthy society based on the three principles Reduce / Reuse / Recycle (3R), because the choice of landfill sites process is not an easy process; because of limited arable land for that, and the prohibitive cost required by the selection, design and operation of the landfill.
4. The need to carry out public awareness, and dissemination of knowledge and education risks and damage caused by environmental pollution and the

consequent health and environmental risks of potentially significant impacts on humans and the environment.

5. The need for this study follows other studies are based on the best locations in the container communities planning, as well as the unification of these containers sizes, and standardize the types of mechanisms for waste collection, and the design and planning of a private respective paths, linking these cars programs and new technologies to access the integrated management of solid waste in the state of Khartoum.
6. Encourage researchers and research centers to conduct similar studies in this area; to determine the risks posed by landfills and planning better based on modern technologies such as GPS and GIS and RS (Remote Sensing).
7. Further studies are needed to find the exact waste generation rate and GDP increase per year for all localities in Khartoum State.