collection in Khartoum Province is irregular, ranges between once to three times a week (Table 6).

Table 6: Frequency of collection/week in Khartoum

Frequency of collection/week	Once	2 Times	3 Times	Irregular	Total
Collection Number	125	37	10	188	360
Percentage	34.7%	10.3%	2.8%	50.2%	100%

50.2% of the households agree upon the irregular weekly duration of domestic solid waste collection. Nevertheless, in many cities of the developing countries, there is an insufficient collection of the solid wastes being generated [24] [25].

According to Ahmed, In Khartoum state 55.1% of the households store the domestic solid waste in uncovering containers, and only 10.8% in covered ones [12]. Therefore, light materials such as polyethylene bags in open containers can easily float in air and water, and travel long distances causing non aesthetical impact when nested, stuck in chain, fences and shrubs (Figure 3 and Table 5).

Figure 3: Open areas with a high accumulation of plastic bag wastes in Khartoum City, Sudan

3.4 Effects of Polyethylene Bags, Refuse on Domestics Animals

In Khartoum State (Table 7), the number of foreign bodies removed surgically from domestic animals is on the increase year after year [26].

Table 7: Foreign Bodies Removed During Clinical Operation in Khartoum State

Clinical Operation	2004-2005	2006-2007	2008-2009
Foreign body	911	966	1498
Dystocia	621	325	327
Milk fistula	127	129	273
Amputation	182	155	-
Hernia	63	60	35
Tumer & Abscess	271	99	-
Others	360	365	68

Beside that Clinical Operation of Foreign Bodies recorded at the top among the other Veterinary Surgical Operations in Khartoum state (Table 7).

However, improper management of municipalities and household domestic solid waste, causing non aesthetical impact beside subject animals to foreign bodies diseases that caused by ingestion of polyethylene bags refuse (see previous section 3.3). Therefore, the above results indicated that there is an urgent need to raise the public awareness about polyethylene bags impact. This will help in the preservation and restoration of the general environment, animals' habitats and feed [26] [27] [28].

3.5. Assessment of Environmental Condition Of The Khartoum

All plastic waste materials are mixed with municipal solid wastes that are either land filled or incinerated [12] [25]. As only 35% of this solid waste quantity is transferred to landfills, while the remaining 65% is disposed of in open dumps [25], where both of them prove to be a disaster for the environment [26] [27]. Incineration leads to air pollution, whereas dumping the waste in open areas causes contamination of environment, water bodies and soil. Thus, an alternative treatment of plastic waste is required as early as possible, such as waste recycling that will satisfy all aspects of durability and appropriate use of resources. In most of the situations, plastic waste recycling could also be economically viable, as it generates resources, which is very important for most of the national and local governments.

4. Conclusion

Economic growth and changing consumption and production patterns are resulting in rapid increase in generation of plastics waste in the world. Due to population increases, the demand for plastic products has steadily increased over the last 40 years and waste plastics are becoming a major stream in solid waste, especially in developing countries [6] [26] [27] [28]. Total imports of the Republic of Sudan in Plastic and articles thereof sector were about US $280.87 million in 2009 and the share of a sector of the total Republic of Sudan's imports, in value, was 3.27 %, with 34.65% of polyethylene raw materials (Polymers of ethylene) out of total sector imports [6] [15]. In Khartoum State (with a population of approximately 5 million), the solid waste generated ranges between 0.6 and 1 kg per capita/day (totaling 3,200 tons). The environmental impacts resulting from the accumulation of plastic waste are huge and increasing [14]. Since plastics are non-biodegradable [26], they cannot be easily returned to the natural carbon cycle; hence the life cycle of plastic materials ends as waste. Nevertheless, disposal facilities polyethylene bags refuse affects wildlife, human health, and the environment [4] [12] [20].

The current study established the following:

- Absence of solid waste management, effective strategies in Sudan,
- Limited financial resources coupled with outdated machines and equipment, poor maintenance operations, and low wages,
- Polyethylene waste is the major constitute of domestic solid waste.
- The level of income of each household group determines the number of polyethylene bags used/reused per day, and the more plastic waste is generated.
- Lack of public awareness regarding polyethylene bags use/reuse problems.

5. Recommendations

Effective and efficient management of waste, including application of 3R (Reduce, Reuse, Recycle) is an essential element for promoting sustainable patterns of polyethylene bags consumption and production. There is a need to develop an integrated waste management plan for Khartoum city with a priority on plastic waste recycling to reduce the final amount of waste for disposal. Beside an environmental awareness program among citizens, workers and decision-makers on polyethylene bags refuse impacts.

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