

# Waste management strategy in the uk environmental sciences essay



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History of waste management in the UK There is no definite definition for waste as this varies from one person to another, what one person is discarding or about to discard could be a valuable resource to another. Any object or substance an individual discards or intend to discard is referred to waste (Osmani, 2012), Adam (1999) defined waste to be something that has no further use value which we intend to get rid of. Studies (Raimo, 2009) shows that waste management is a concept this is because waste cannot be prevented as human being have being dealing with waste for decades of waste now (Gentil, et la. 2011). Waste without proper management poses threat to the people's health (William and Cole, 2013) howbeit; investigations (Ying, et al. 2012; Lebersorger and Schneider, 2011) shows that non effective management revealed the low quality of life awful odour and vermin infestation caused on the environment. As a result, legislation was introduced by the UK (Martin, 2012) to combat the issue in 1875 (Ramesha and Diganta, 2012), according to Bennett (2009) Public health Acts were introduced to cover disposal and waste management; responsibilities were also designated to authorities who will be responsible for the removal disposal of waste. Because Landfill is cheaper, it was considered as a method of waste disposal and management system in the 20th century. All organic and municipal solid waste were then taken to landfill which lead to greenhouse gas as a result of the methane gas that comes out from the waste disposed at landfill (Harrison, 2003). Waste management strategy in the UK The UK strategy for waste management is based upon the concept of waste hierarchy (Paul, et al. 1999), with view of sustainability to prevent disposal of reactive waste in landfill (Juergen, et al. 2007). The United Kingdom waste management strategy is one which <https://assignbuster.com/waste-management-strategy-in-the-uk-environmental-sciences-essay/>

recognises social value (Adam, 1999) and put the needs of everyone in mind (Holt et al. 2000), it involves effective protection of the environment at large (Murray, 1997), values natural resources (Valve, 2002) and avoid the abuse of these resource and it aims at maintaining a high and stable levels of the economic growth and create employment (Cabaraban et al. 2008). Studies (Murray, 1997; William, 1993) show that the initiations of policies at international, national and local levels were introduced in order to discourage the disposal of waste to landfill and promote the alternative which was the waste hierarchy including landfill tax (Chandrappa and Das, 2012). With the introduction of EU Waste Framework Directive in 1975, to every member state (Pankhurst, et al. 2011), measures are taken to make sure that waste is recovered and also properly disposed to avoid causing harm to the environment (Ole, 1996). Gertsakis and Lewis (2003) states waste management hierarchy to be from reduce and reuse; recycling; composting down to landfill, this is supported by David (1996); Alan and David (2007). The Waste Framework Directive has being effective in the UK through the national waste management strategies (Tooraj and Rabindra, 2010), this has favourably aided in encouraging households to cooperate in sustainably manage the municipal solid waste (Christoper, et al. 2001; Massimiliano and Roberto, 2008; Haynes, 1995; Costa, et al. 2010). Nevertheless, studies Rachel and Paul (2000) shows how England and Wales waste management strategies has been developed, and policies implemented in Northern Ireland has also helped in the reduction of municipal solid waste that would have been disposed to landfill (Paul, et al. 2001). According to John et al (1998) landfill tax was established in 1996 to help promote a more sustainable way to waste management, however, it <https://assignbuster.com/waste-management-strategy-in-the-uk-environmental-sciences-essay/>

was implemented in the UK (Nicky, et al. 2004), and artificially it raised the cost of waste disposal (Andrew, et al. 2011) encouraging local authorities to readdress their waste management strategy to total waste reduction, reuse, recycle (Dayna, 2012) in order to discourage the disposal of waste on landfill (Klassen and Whybark, 1999). Howbeit, studies Cabaraban et al (2008), shows that the Landfill Tax Credit Scheme introduced with the aim of investing into other alternative option to landfill and increase sustainable approaches to generated waste. Reduction and Reuse Waste reduction is emphasize on the basis of using technologies and processes that require less use of materials in production (Olamide et al. 2012), the efficient utilization of resources help reduce environmental pollution (Osmani, 2012; Murray, 1997; William, 1993) where this is not effective, studies Tsia and Chou (2004); Shaukat and Kamal (2010) shows material reuse and products can be employ depending on the suitability for the same purpose or another without reprocessing of the product. Studies Henningsson et al. (2004), prevention of environmental pollution is achieved by the reduction of the source of pollution, source reduction is the highest on the waste hierarchy (Juergen, et al. 2007 and Murray, 1997). Lee (2003) shows that recycling of waste provides job, reduce pollution emission, lower council tax and saves wasting of raw materials. According to Pia (2013) recycling waste especial in the waste electrical and electronic equipment (WEEE), is a means of recovering materials, and reduction of production cost of a new product of the same kind (Simeos and Marques, 2012). In UK a programme was design to help companies to improve on environmental performance and reduce waste at the source level (Gibson, 2001) According to Holt et al. (2000) the designed programme Envirowise previously known as " Environmental <https://assignbuster.com/waste-management-strategy-in-the-uk-environmental-sciences-essay/>

Technology Best Practice Programme" was the government strategy which aimed at working closely with industries to develop an approach that will help produce and promote source waste reduction, several other studies (Valve, 2002; Murdoch, 2000; Ying, et al. 2012; Henningsson et al; Cabaraban et al. 2008) Composting is a potential element in UK's sustainable waste management (Slater and Frederickson, 2001), composting is the decomposition of organic, biodegradable waste (Hideo, 1998). Finstein and Morris (1975) describe composting to be the process where microbes degrade on organic soil materials with the involving of aerobic respiration passing through medium known as thermophilic. These biodegradable quarters of municipal solid wastes which are aerobically and anaerobically decompose are applied on lands and also sold in markets as compost (Chynoweth et al. 1992), This aspect of municipal waste management is highly recognize and economical in United State and Europe (Xin-Tao et al. 1991). The UK promotes sustainable management of biodegradable waste (Yepson, 2008), according to Holland and Proffitt (1998), in Britain municipal composting is taken seriously as a waste management option, to reduce waste which relies on landfill to produce compost for the soil in farming (Eleni et al. 2012) as well as protecting the quality of soil and preventing contamination (Smith, 2009), this is supported by studies Paola et al. (2005) the process of composting is a very useful method that stabilizes materials in other words used as a source of nutrient and conditioner for soil. Studies Garcia et al. (2000) one of the techniques used to repair a degraded soil quality is the addition of soil organic matter, according to Finstein and Morris (1975) the decline in soil fertility is caused by the decreasing of soil organic matter. In the United Kingdom, studies Yara and Gee (2012) describes urban <https://assignbuster.com/waste-management-strategy-in-the-uk-environmental-sciences-essay/>

composted waste that is added to Agricultural land is not just for waste disposal but also for land fertility. However, according to Slater and Frederickson (2001) the practice of composting which place importance on the effectiveness of organic matter of some fraction of municipal waste tends to comply with the requirement of the environmental regulation. The UK modern composting operation is describe to involve the processing of municipal solid waste (Costa et al. 2010), decomposition of the organic fraction of these waste (Finstein and Morris, 1975; Yepson, 2008), and dispatching or marketing of the final produced compost (Paola et al. 2005). As stated in Finstein and Morris (1975), Chynoweth et al. (1992) also describe composting practice as a logical principal solution continuous use of waste as feed for animals. In addition, Hideo (1998) composting provides fertilizer that is returned to soil hence, providing a life cycle benefit.

Incineration Incineration also known as energy recovery is the conversion of waste into energy (Leigh and Peter, 2012). As stated by Ayhan (2011) incineration can be described as a thermal treatment of waste material, and recovers energy as a secondary benefit (Marie and Brack, 1997). Porteous (2005) defined incineration as a form of controlling direct combustion of waste. Studies Eriksson and Baky (2010) shows that the UK considers incineration as an essential tool for sustainable waste management, because it does reduce Dioxin (Bosmans et al. 2012), argument showed that it was conducive for all other waste management option to be put into play but the refusal of energy from waste incineration cannot be ruled out (Carlo and Sorlini, 2002; Reiche and Bechberger, 2004). This was proved correct by Tooraj and Rabindra (2010) in past years waste incineration was just

considered as a strategy and technology to reduce the large volume of  
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harmful substances to prevent health threat, studies Sylvain et al. (2011); Lund (2009) shows that in this present days waste incineration also combine with recovery of energy. However, in the UK, the local authorities are responsible for waste management; they consider it best to move up to waste minimisation rather than waste disposal (Juergen, et al. 2007). Currently, there exist about 13 incinerators in the UK which processes capacity of 2.9 million tonnes of waste in a year (Sylvain et al. 2011). This technology makes it easier for volume of waste to reduce a great deal (Lipp, 2007) and at the same time inorganic contaminants (Eriksson and Baky, 2010) are captured in the heat turning them into ash residue which is reused in some allotment programmes (Stehlik, 2009; Porteous, 2005; Finstein and Morris, 1975; Perry et al. 2008; Hartenstein and Horvay, 1996). Waste Management Problems in Nigeria Waste contributes a lot to public health nuisance in both rural and urban areas in Nigeria (Sule, 1981). According to Arisukwu (2011), the state of population determines the rate of waste generated per capita, Mbande and Blight (1996) supported by stating that the aggregate number of people settling in a particular area determines the amount of solid waste produced. Cities in Nigeria among the fast growing cities in the world are faced with solid waste generation which is attracting great concern globally and locally (Basse et al. 2006) of which little or no attention is given (Ogbonna et al. 2002), supported studies Aziegbe (2007) demonstrate how different streets experience continuous litters of waste from industries and individual household Babayemi and Dauda (2009) the rate at which solid waste in Nigeria increases is very alarming due to lack of modern technology for a sustainable management. One of the major

challenges facing Nigerian cities is the management of solid waste  
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(Olubosede et al. 2012) compared to the UK, where the collection, transfer and disposal of municipal solid waste has been technically dealt with by the government (Paul, et al. 1999) through the implementation of international policies (Tooraj and Rabindra, 2010). This problem is as a result of rapid urbanization in many cities in the country (Clark et al. 1976), the conspicuous weakness of planning agencies responsible for urban development (Aruna, 1986), private sectors lacking interest in investing in the service (Adewole, 2009), lack of facilities to aid institutional processes (Yusuf et al. 2008; Ogwueleke, 2009), nonchalant attitude of waste producers (Hassan, 2004) and poor management information (Wilson, 2007). Studies Ojoawo et al.(2011) shows that it is a very common thing for one to see heaps of refuse dumps on every street, market places and open places in the different states in Nigeria. However, cities like Abuja, Lagos, Port-Harcourt, Calabar, Uyo, Warri, Ibadan, and several others have had the opportunity to improve on their waste management crisis (Imam et al. 2008) unfortunately, excessive migration leading to rapid urbanization exceeded the provision for the plan (Agunwamba, 2003 and Clark et al. 1976). The large volume of waste generated in Lagos state highly unavoidable (Arisukwu, 2011), Studies Olamide et al. (2012) states that only Lagos state generate about 3, 066, 762 tonnes of waste every year

**Municipal Solid Waste:** Municipal solid waste is mainly referred to as garbage which consists of all our daily items we use and intend to throw away (U. S EPA, 2012). According to Ole (1996), municipal solid waste comprises of household waste and some industrial and commercial waste. As these wastes continue to increase every day, safe treatment is becoming increasingly important (Tooraj and Rabindra, 2010) especially in developed countries such as

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Nigeria, just as in the United Kingdom (Paul, et al. 1999) in order to move towards a refreshing sustainable environment. Municipal solid wastes are generated in the course of production and distribution of products and the household consumption (Sabbas et al. 2003), studies Gordon (2002) shows that as the daily demand of the society generate waste in large quantity as the standard of living increases, giving rise to landfill waste disposal as a result not considering the amount of resources that can be generated as in the case of Nigeria (Aruna, 1986). It is very efficient to reduce landfilling in favour of energy and material recovery to obtain a sustainable environment (Olamide et al. 2012). In spite of the advantage Nigeria have to learn and take example from the developed countries (Haynes, 1995), in managing municipal solid waste in a more sustainable and environmental friendly (Roberto, 2008) and cost effective way (Paul, et al. 1999), to avoid landfilling, Nigeria still have a very low performance level (Sule, 1981). However, studies Olubosede et al. (2012) prove that waste composition examinations are not often carried out in Nigeria, Sule (1981) and Agunwamba (2003) the management of municipal solid waste in Nigeria is become a very complex situation that requires the adoption of a developed countries technology and policies. Eriksson et al (2005) this adoption requires the participation of different parties like the local authorities, industries and the communities. Energy from Waste: Converting waste to energy is an important strategy of waste management to reducing the amount of waste that is supposed to go to landfill (Norbu et al. 2005). This technology is incineration in which the treatment involves quite a number of heating, electrical power and biogas (Eriksson and Baky, 2010) not neglecting the safety of the environment and the economy. Studies Harrison <https://assignbuster.com/waste-management-strategy-in-the-uk-environmental-sciences-essay/>

(2003) shows that emission of toxic gases occurs from municipal solid waste disposed at landfill; this is a serious threat to the health of citizens in a country (Beckfriis et al. 2001). However, in years to come because of indiscriminate felling of trees (Ojo, 2004; Baccini et al. 2008; Ogbonna et al. 2002), destroying of forest to secure a dumpsites for waste (Smit and Nasr, 1992) leading to scarcity of land and ineffective environmental policies (Ferris et al. 2002), the cost of landfilling waste will drastically increase thereby making the recovery of energy from waste more costly (Reinhart et al. 2012). Nigeria as a country produces more than 100 million tonnes of waste in 2006 (Ogbonna et al. 2007; Afon and Okewole, 2007), studies Nicky et al. (2004) shows that this quantity is suitable for anaerobic digestion every year. Nevertheless, this can generate about 20-30 TWh of heat and electricity to people (Larjola, 1995; Vatani et al. 2012; Sylvain et al. 2011; Raven, 2007; Munster and Lund, 2009). At this point incineration is the best option and alternative to landfill (Carlo and Sorlini, 2002), Hunsicker et al. (1996) supports the fact that waste to energy by the use of incineration technology is suitable for sustainable waste management, supported by Cherubini et al. (2009), Ulgiati et al. (2011), Amutha et al. (2008). In the UK and across the European countries, incineration is proven to be effective in converting waste to energy (Alter and Dunn, 1980; Hartenstein and Horvay, 1996; Faaji, 2006; Arnulf et al. 2011; Gohl). Studies Lipp (2007) shows that Denmark, Germany and the UK and Martin, 2007K proves to be leading countries that have experience the use of this technology, having their policies as a motivating factor to their success (Mitchel, 2004). According to European Communities (2005) Denmark a good example country that relies 56 per cent on incineration, the United Kingdom has the one of the best

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renewable energy resource in Europe (Connor, 2003) especially in Scotland. This is because the United Kingdom made raised a well funded commitment policy to increase their energy resource (Reiche and Bechberger, 2004). More so, German government have different measures put in place for electrical energy from waste (Agnolucci, 2006), according to Perry et al. (2008) in Germany efficiency method of energy is applied in all sector where energy gain is used in residential home, work places and industries. Strategies applied in the integrated processing industries are successful (Hartenstein and Horvay, 1996) However, Stehlik (2009) shows that recent technologies have caused improvement in the thermal process of municipal solid waste and other types of waste. Cleary (2009) Municipal waste environmental performance can be evaluated by using life cycle assessment tool. Life cycle analysis the current scientific evidence, proofs that anaerobic food waste digestion is an environmentally friendly (Norbu et al. 2005) option in place of other waste management options like the recovery and composting Lee (2003) because there is are significant outputs like biogas (Tooraj and Rabindra, 2010), and the remaining materials after the anaerobic digestion known as digestate which turns out to be fertilizer and source of energy Stehlik (2009) are reusable. There is need for an effective waste management strategy that has helped the developed countries to be applied in Nigeria, the Giant of Africa, hence this study the application of modern incineration mechanism in Nigeria. A pragmatic design is required; this design and management technology will enhance sanitary of the landfill and will also minimize the emission of green house gas and methane, the release of leachates from landfill that contaminates underground water body will

also be reduced to minimal. This technology will go a long way to helping the electric energy crisis in Nigeria; this will be further discussed in details.