

Psyc 434: environmental psychology

[Environment](#), [Pollution](#)



PSYC 434: ENVIRONMENTAL PSYCHOLOGY WASTE DISPOSAL WITH SPECIFIC REFERENCE TO SOLID WASTE Adeniji Ayodele (10317112) 9TH March, 2013.

With an increase in industrial development and population growing at an alarming rate, waste and for that matter waste disposal, is becoming a growing problem worldwide. This constitutes a major problem especially for most countries in the developing world as a result of inadequate mechanisms for the proper disposing of wastes. According to Narayana (2008), “ with continuous economic development and an increase in living standards, the demand for goods and services is increasing quickly, resulting in an increase in per capita generation of solid waste". Rapid population growth, urbanization, and industrial growth have led to severe waste management problems in the cities of developing countries like Ghana. The term 'waste' and the act of 'wasting' are human inventions. Waste doesn't exist in nature. Everything has a purpose in nature. Waste was created by humans for short-term convenience and profit. Since early modern times, disposing of waste has been an important concern for both individuals and community officials alike. Wasting results in long-term harmful consequences for humans, nature, and the economy such as the outbreaks of diseases (e. g. cholera, malaria, typhoid fever and so on), reduction in the earth's capacity to supply raw materials in the future, and the inability of the natural environment to absorb and process these materials. Thus, environmental sanitation is of great concern to governments and policy makers in order to prevent the occurrence of such harmful consequences. With all these said about waste, what then is waste? What constitutes waste? What are the effects of waste? What are the modern methods of waste disposal? These

are issues that will be covered in this paper with particular emphasis on solid waste. What is waste? Waste also known as rubbish, trash, junk, garbage, depending on the type of material or the regional terminology has been defined in several ways. A few would be given below. The 1995 Environmental Act of UK defines waste as “ any substance or object which the holder discards or intends to discard”. A ‘ holder’ means the producer of the waste or the person who is in possession of it. According to the United Nations (UN) Statistics Division, Glossary of Environmental Statistics wastes are “ materials that are not prime products (that is products produced for the market) for which the initial user has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he or she wants to dispose. Wastes may be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities. Residuals recycled or reused at the place of generation are excluded. ”

Waste has also been described as an unwanted or undesired material or substance. It may consist of the unwanted materials left over from a manufacturing process (industrial, commercial, mining or agricultural operations,) or from community and household activities. The material may be discarded or accumulated, stored, or treated (physically, chemically, or biologically), prior to being discarded or recycled. It is also used to describe something we use inefficiently or inappropriately. In very simple terms then, waste is regarded as any substance or object, which is disposed of or is intended to be disposed of or is required to be disposed of by the provisions of national law. It is an unavoidable by-product of most human activity.

Based on the above definitions, we can therefore say that waste constitutes of all items that people no longer have any use for, which they either intend to get rid of or have already discarded. Types of waste There are two main types of wastes. These are the biodegradable and the non-biodegradable wastes. Biodegradable wastes refer to wastes which can be broken down, in a reasonable amount of time, into its base compounds by micro-organisms and other living things, regardless of what those compounds may be. Examples can be found in municipal solid waste (sometimes called biodegradable municipal waste, or BMW) as green waste, food waste, paper waste, and biodegradable plastics. Other biodegradable wastes include human waste, manure, sewage, and slaughterhouse waste. In the absence of oxygen much of this waste will decay to methane by anaerobic digestion. Non-biodegradable wastes are wastes that will not break down (or will not for many years). These wastes are not easily affected by micro-organisms and other living things. Examples include plastics, metal and glass. Dangerous chemicals and toxins are also non-biodegradable, as are plastic grocery bags, Styrofoam (polystyrene), and other similar materials. Having given a brief description of what waste is and the two broad categories, we will move on to discussing in detail one the types — solid waste- which is our main interest. What is solid waste? Solid waste refers to any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials including solid, liquid, semi-solid, or contained gaseous material, resulting from industrial, commercial, mining and agricultural operations, and from community activities. Solid wastes have also been referred to as trash, garbage, junk, or

rubbish, depending on the type of material or the regional terminology. In simple terms, it refers to any form of waste that is less than 70 percent water. In other words, it represents all discarded materials other than fluids. It. Examples include hazardous, municipal (household and commercial) waste, industrial and special waste. Nearly everything we do leaves behind some kind of solid waste. Although it can include a wide variety of materials and come in many forms, solid waste in general is comprised of two major components: * Municipal Solid waste and * Construction and Demolition Debris Municipal Solid Waste (MSW) refers to trash generated by residents, businesses, institutions and municipalities, but not including hazardous waste or other industrial by-products. It is the first and largest component of the solid waste stream. This type of solid waste typically contains a wide variety of discarded materials such as food scraps, yard wastes, paper and paperboard products, plastics, metal, rubber, leather, textiles, wood, glass, and other miscellaneous materials. Construction and Demolition Debris (C&D) is usually generated from the construction, renovation and demolition of buildings, roads, bridges and other structures. Examples of this type of solid waste include asphalt, brick, concrete, metal, wood, wallboard and plaster, and roofing and siding materials (such as wood and asphalt shingles). Wood waste can be painted or stained, unpainted or untreated, pressure-treated, or "engineered" (particle board, for example), and also can take the form of discarded pallets and crates. Other types of non-hazardous waste produced in our society, include non-hazardous industrial wastes and sludges, sewage sludge, junked cars, contaminated soil, medical waste, and dredge spoils. Solid Waste Disposal Waste disposal refers to the

management of the huge amount of waste from modern societies. Various methods to collect and decompose waste in an organized manner have been used, but emissions from the collected waste remain a threat. Our inability to dispose of these solid wastes or the improper deposition of such leads to some effects on the environment. Improper garbage disposal is not just an eyesore; it poses a serious threat to nature. Major threats include:

- * Soil Contamination Plastics, metals, papers and certain types of glass can all be recycled at a local recycling center. If one takes the time to send these items to recyclable locations, the items can be reused and returned to consumers rather than ending up as trash or hurting the environment. If recyclables are placed into the ground they can potentially contaminate the surrounding soil. The Western Courier shares with readers that as plastic water bottles break down they can release DEHA, a type of carcinogen (cancer causing agent) that can cause reproductive problems, liver issues and weight loss. This type of chemical can leach into the causing its contamination which can greatly affect plant and animal life as well as water sources. Also, newspapers or paper that contains ink can be toxic to the soil as well. If the garbage is dumped or not contained properly in a landfill it will contaminate the surrounding ground.
- * Air Contamination Disposing of garbage containing harmful chemicals such as bleach, acid or oil requires that it is disposed of in approved containers and labeled correctly. Paper, plastics and other materials that are burned can contaminate the air when they are burned. Over time the chemicals released can build up in the ozone layer. If they contain toxic chemicals like dioxin, they can reach the air that people breathe leading to a public health risk. The improper disposal of garbage can

also lead to the release methane gases. According to the Energy Information Administration, these gases are greenhouse gasses that can destroy the earth's ozone layer and contribute to significant climate changes or global warming. * Animals and Marine Life Human beings are not the only ones affected by improper garbage disposal, animals are too. According to Conservation International, garbage dumping and discharging raw or untreated sewage into water bodies can threaten marine life and animals who come in contact with the water. When waste forms a cluster or algal bloom, the area can suffocate and contaminate sea bottom habitats such as coral and fish reducing their numbers. This contamination not only destroys their habitat it can also affect human consumption in the sense that the fish and shellfish that were feasting off of contaminated areas get to fishermen who catch them for human consumption. Old fishing lures, plastic bottles, rope, Styrofoam, cigarette butts and fishing lines can be consumed by marine animals leading to the death of millions each year according to Conservation International. Ghana as an example of a developing country is faced with the problem associated with solid waste disposal. Key problems principally relate to * Indiscriminate dumping; * Increasing difficulties with acquiring suitable disposal sites; * Difficulties with conveyance of solid waste by road due to worsening traffic problems and the lack of alternative transport options; and * The weak demand for composting as an option for waste treatment and disposal. Generally the poor state of waste management faced by the country is clearly not only an engineering problem. Factors such as rapid urbanization, poor financing capacity of local authorities, low technical capacity for planning and management of solid

waste, weak enforcement of environmental regulations - which allow local authorities to flout environmental regulations without any sanctions - have all contributed to compound the problem

Waste Disposal Methods

Various methods of solid waste disposal have been applied over the years, among which are:

- * Landfill Landfills receive nearly 90 percent of municipal solid waste including household and commercial waste, demolition and construction debris, non-hazardous sewage sludge and industrial sludge. If the waste is dumped untreated, it can promote the proliferation of rats, flies, and other vermin (destructive animals or insects), encourage growth of disease-carrying organisms, contaminate surface and underground water, scar the land, and preempt open space. An alternative method of solid waste disposal is the sanitary landfill, first employed in Fresno, California, in 1937. The sanitary landfill is a method in which waste is spread in thin layers, each tamped compactly and covered by a layer of earth. Although more expensive than open dumping, the sanitary landfill eliminates health hazards and permits reclamation of the site for construction, recreation, or other purposes. The key disadvantages of this method are that feasible locations are relatively rare and costly and that sites must be insulated from water resources to avoid polluting them. Both open dump and sanitary landfill disposal depend on the natural degradability of wastes for an ultimate return to normal earth conditions. Decay, however, takes time. Buried paper, for example, can take as long as 60 years to decay. Many plastics and synthetic textiles do not degrade at all. The regular testing of local water sources ensure the landfill is operating correctly and regular covering of compacted solid wastes with soil helps reduce insects, rodents, odor, litter and germs. *

Incineration This is a disposal method in which solid organic wastes are subjected to combustion so as to convert them into residue and gaseous products. It reduces the volume of solid wastes to about 20 to 30 percent of the original volume. Incinerators convert waste materials into heat, gas, steam and ash. It is recognized as a practical method of disposing of certain hazardous waste materials (such as biological medical waste). Incineration is a controversial method of waste disposal, due to issues such as emission of gaseous pollutants. This is a common technique employed in Japan where there is scarcity of land, as these facilities generally do not require as much area as landfills. Waste-to-energy (WtE) or energy-from-waste (EfW) are broad terms for facilities that burn waste in a furnace or boiler to generate heat, steam or electricity. Combustion in an incinerator is not always perfect and there have been concerns about pollutants in gaseous emissions from incinerator stacks. Particular concern has focused on some very persistent organics such as furans may be created which may have serious environmental consequences. * Recycling This is a resource recovery practice that deals with the collection and reuse of waste materials such as empty beverage containers. The materials from which these items are made can be reprocessed into new products. Material for recycling may be collected separately from general waste using dedicated bins and collection vehicles are sorted directly from mixed waste streams and are known as kerb-side recycling which requires the owner of the waste to separate it into various different bins (typically wheelie bins) prior to its collection. Common among the consumer products recycled include aluminum such as beverage cans, copper such as wire, steel food and aerosol cans, old steel furnishings

or equipment, polyethylene and PET bottles, glass bottles and jars, paperboard cartons, newspaper, magazines and light paper, and corrugated fiberboard boxes. Prevention and Reduction This is one of the best methods, if not the best method of managing waste which can be achieved in a number of ways like making use of secondhand items, repairing broken items instead of buying new ones, designing products to be refillable or reusable (such as cotton instead of plastic shopping bags), encouraging consumers to avoid using disposable products (such as disposable cutlery), removing any food/liquid remains from cans, packaging, and designing products that use less material to achieve the same purpose (for example, of beverage cans). More recent techniques include the intensified combustion of wastes to produce heat for generating power, pyrolysis - the thermal decomposition of wastes in controlled amounts of oxygen to produce valuable petrochemicals; the residue is an inert char of little bulk, replacing polystyrene packaging with less bulky wrapping made largely of paper. Wider application of such processes is being advocated for not only to diminish pollution of the environment by solid waste, but also to conserve natural resources. In, conclusion, waste has been described as any substance or object, which is disposed of or is intended to be disposed of or is required to be disposed of by the provisions of national law. It is an unavoidable by-product of most human activity. There are two broad categories of wastes. These are the biodegradable and non-biodegradable. Solid waste which is an example of biodegradable waste refers to any form of waste that is less than 70 percent water. In other words, it represents all discarded materials other than fluids and examples include hazardous,

municipal (household and commercial) waste, industrial and special waste. The two main types of solid wastes are municipal solid waste and construction and demolition debris. Solid waste disposal poses some threats to the environment including soil contamination, air contamination, and finally a threat to animal and marine life. Various methods employed in the disposal of solid waste include landfills, recycling, and incineration. More modern techniques include the intensified combustion of wastes to produce heat for generating power, pyrolysis - the thermal decomposition of wastes in controlled amounts of oxygen to produce valuable petrochemicals; the residue is an inert char of little bulk, replacing polystyrene packaging with less bulky wrapping made largely of paper. Wider application of such processes is being advocated for not only to diminish pollution of the environment by solid waste, but also to conserve natural resources. Ghana is one of such nations facing these problems with waste disposal due to a number of reasons including indiscriminate dumping, increasing difficulties with acquiring suitable disposal sites, Difficulties with conveyance of solid waste by road due to worsening traffic problems and the lack of alternative transport options; and The weak demand for composting as an option for waste treatment and disposal The Ghanaian experience shows that within the existing socio-economic context, manual systems are appropriate. The challenge therefore is to develop and promote disposal systems that require a minimum level of mechanical equipment. REFERENCES Boehlke, J. (2010). The Effects of Improper Garbage Disposal. <http://www.livestrong.com/article/124375-effects-improper-garbage-disposal.htm> Mensah, A., & Larbi, E. (2005). Solid Waste Disposal in Ghana. <http://www.lboro.ac>.

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