

Fatima Anjum

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The “Evergreen” Hills

00:00:00-00:00:13

[Tranquil music plays. A sky, sun, hills, and a road are drawn. The outline of a car is drawn.

Tires, headlights and windows are added to the car. The car begins to move across the road.]

Fatima Anjum: A cool summer breeze enters through the car window as my family and I drive through the suburbs. I look at the baby blue sky and cotton ball clouds above. The land was made up of many green grass hills with not a single tree in sight.

00:00:13-00:00:26

[A drawing of a person in the passenger seat of the car. The person has long black hair and is smiling.]

Anjum: I was amazed by the view, I felt as if I could run on those hills forever without a care in the world. “Wow, look at those hills, they are so beautiful!”, I cheerfully said. My father looked out and then told me:

00:00:27-00:00:29

[The person’s mouth turns into a frown.]

Anjum: “Those aren’t natural hills.”

00:00:29-00:00:32

[The person looks confused. Their mouth opens to speak.]

Anjum: “What do you mean?”, I asked.

00:00:32-00:00:35

[The person frowns.]

Anjum: “Those hills are actually large piles of trash that have been covered up to look like hills.”

00:00:35-00:00:44

[The person’s mouth opens in shock, and then returns to a frown.]

Anjum: I was speechless, I looked out the window at those hills. I was imagining what my father said, *So this is where trash ends up?*

00:00:44-00:00:56

[Intriguing music begins to play. The screen turns to a fuzzy gray and white background. “The ‘Evergreen’ Hills” is written across the background in green. Green stripes and dots are drawn to decorate the border.]

00:00:56-00:01:06

[The intriguing music continues as the screen switches to the Google homepage. “Define Landfill” appears in the search bar. The definition of “landfill” appears on the screen.]

Anjum [reading the definition on the screen]: According to Google, a landfill is defined to be “a place to dispose of refuse and other waste material by burying it and covering it over with soil” (Google, Oxford Languages). [especially as a method of filling in or extending usable land.]

00:01:07-00:01:16

[Images appear on the screen: a square image showing an assortment of foods with an American flag stuck in the middle of a salad; a black wastepaper basket overflowing with crumpled paper; a photo of crushed and flattened plastics of various colors; a photo of a piles of batteries of various types and shapes; an image of containers of motor oil, gasoline, and household cleaners.]

Anjum: So all the trash that you produce, this includes old food, used paper, dead batteries, plastics, wrappers, household items, the list just goes on,

00:01:16-00:01:18

[An image of a dump truck overflowing with trash, dumping its contents into a landfill. Behind the dump truck, seagulls fly over a field of trash that seems to extend to the ocean.]

Anjum: are mainly thrown into these landfills.

00:01:18-00:01:26

[Parts of a flowchart appear on the screen: a digital drawing of a figure throwing a banana peel into a square trash receptacle. A red arrow points from the receptacle to a digital drawing of a drawstring garbage bag. A red arrow points from the garbage bag to an image of an overflowing recycling bin. A red arrow points from the recycling bin to the outline of a dump truck. A red arrow points from the dump truck to an image of a landfill with a machine pushing mounds of garbage.]

Anjum: So whatever we throw in our little trash can at home are just taken away to make these huge mountains of trash.

00:01:27-00:01:48

[A screengrab of a page on the “Dumpsters.comBlog. [SH1] The headline reads “Curbing America’s Trash Production Statistics and Solution.”]

Anjum: According to trash production statistics today the United States produces about 268 million tons of waste, about 140 million tons of that waste, which is 52%, is thrown into landfills (Juliana McDonald). All of that waste just builds and builds into these giant mountains of garbage, that end up covering acres upon acres of land.

00:01:48-00:02:06

[A screengrab of a page on the University of Colorado Boulder Environmental Center’s website. The headline reads “The Hidden Damage of Landfills.”]

Anjum: Kayla Vasarhelyi a graduate from the University of Colorado who wrote an article about the negative impacts of landfills, states that, “The average landfill size is 600 acres. With over 3,000 active landfills in the United States, as much as 1,800,000 acres have been lost” (KaylaVasarhelyi).

00:02:06-00:02:22

[A drawing of a red barn and grain silo appear. A drawing of a blue house appears. A drawing of a gray commercial building appears. A drawing of a burgundy shop with a white-and-burgundy awning appears. A drawing of a hospital appears. A drawing of a yellow school bus with black tires and a black stripe appears. A green vine is drawn around the bottom and right side of the screen, and green leaves are added.]

Anjum: Basically, we are losing almost 2 million acres of land from our own landfills. These lost lands could have been used for farming, housing, companies, stores, health facilities, schools, or even left alone for ecosystems to flourish.

00:02:22-00:02:36

[The complete flowchart of the person throwing away their banana peel leading to the image of the landfill, reappears on the screen.]

Anjum: This method of discarding trash has been used by the United States for decades as a way to keep society clean and safe from waste contamination related issues, such as disease, poisoning, and bacteria. But let’s think,

00:02:36-00:02:44

[A drawing of a person shown from the waist up appears. The person has long black hair and a pink shirt. The person's arms are held up to their shoulders in a quizzical posture. Pink and black question marks are arranged around their head and torso.]

Anjum: Is this method truly beneficial? Does this method of disposing waste benefit us and the environment?

00:02:44-00:02:54

[A digital drawing of a mound of garbage appears. The top of the mound is a lighter color from the bottom of the mound. At the bottom of the mound, trash bags can be seen. Green oozes out of the bottom of the mound and is labeled "Leachate" in black letters. Gray plumes of smoke billow from the top of the mound and are labeled "LFG" in black letters.]

Anjum: Landfills produce two dangerous byproducts: Landfill gas LFG and Leachate. Both of these byproducts are quite harmful to the environment and us.

00:02:54-00:03:15

[A photograph of a landfill appears. Gray gas rises from the surface of the landfill. Above the image, a header in black letters reads "Landfill Gas: LFG")

Anjum: Landfill Gas LFG. As organic wastes, such as thrown out food, decay in landfills they produce LFG, a natural byproduct of the decomposition of organic material. LFG contains roughly 50% methane and 50% carbon dioxide, two major factors contributing to global warming.

00:03:15-00:03:36

[An image of a pie chart, with segments in various shades of blue, appears. The header reads, "2021 U.S. Methane Emissions, by Source."]

Anjum: From information collected by the Environmental Protection Agency “landfills are the third-largest source of human-related methane emissions in the United States” (EPA). Based on their data collected from 2020 about 17% of methane emissions in the United States are from landfills.

0:03:36-00:03:54

[A graphic image titled “Global warming and the greenhouse effect” appears. A graphic of the sun radiates three arrows directed towards an image of earth’s atmosphere and the earth. One arrow changes direction after reaching the earth’s atmosphere; another arrow changes direction after reaching the earth; a final arrow bends after reaching the earth. There is one arrow radiating from the earth; it does not change direction, but points directly out of the atmosphere.]

Anjum: With landfills being such large contributors of methane and carbon dioxide, air pollution is increasing, along with global warming. As more heat-trapping gasses are being produced, this leads to climate change. More sunlight and solar radiation that should bounce off the Earth are being trapped in our atmosphere. (Natural Resources Defense Council).

00:03:54-00:04:09

[The screen is filled with a grid of 9 images arranged in three rows of three: a forest fire seen from the highway; a lightning storm; a desert with a cracked landscape; an aerial photo of a hurricane; a dust storm; a forest fire seen from the side of a cliff; a tornado; a car in a floodplain; and palm trees bent over in heavy wind.]

Anjum: This causes abnormal changes in temperatures and extreme weather. Overall, these landfills are polluting our air with LFG and harming our environment. People alone have also faced health consequences from this gas.

00:04:09-00:04:39

[An image of a website appears; four headers read: "Movement of Landfill Gases into Buildings" "Odors from Landfill Gas; "Health Effects of Ammonia and Hydrogen Sulfide"; and "Methan Safety Hazards." "Health Effects of Ammonia and Hydrogen Sulfide" is highlighted.]

Anjum: LFG carries gaseous chemicals including ammonia and hydrogen sulfide, all of which are harmful gaseous substances to human health. In 2019 the New York State Department of Health conducted studies on communities living near landfill sites and collected information on health occurrences associated with LFG, "The reported health complaints included eye, throat and lung irritation, nausea, headache, nasal blockage, sleeping difficulties, weight loss, chest pain, and aggravation of asthma" (New York State Department of Health).

00:04:39-00:04:51

[An infographic by the University Van Pretoria titled "Health Effects of Air Pollution" appears. Subheadings read: "Who is More Affected"; "Short Term Effects"; "Long Term Effects."]

Anjum: In trying to keep communities clean and safe from trash, some people are still facing health issues especially in breathing due to the air toxins these landfills are releasing.

00:04:51-00:05:26

[A photograph of a dirt-covered landfill, with gray smoke rising in plumes from its surface.]

Anjum: Recently on March 2nd, NPR reported about a landfill fire in Alabama.

Clip from the NPR report: "You know that smell when you're passing by and somebody's burning trash in their backyard. I can remember the first time I ever smelled it, it's memorable. And apparently it happens on a giant scale at landfills. Thousands of landfills catch fire across the United States every year. And some of those fires last days. Some of those fires last weeks. And in Alabama, one landfill has been burning for more than three months" (Mary Scott Hodgins).

00:05:26-00:06:11

[The image of the landfill with the title “Landfill Gas (LFG)” reappears.]

Anjum: Landfills are a collection of all kinds of waste and often contain flammable substances including LFG, chemicals and decomposing organic matter which spontaneously ignite. The smoke consists of carbon monoxide, methane, hydrogen sulfide and other air toxins as well as dust, causing residents respiratory issues as the LFG and smoke fill the air. During the Alabama landfill fire, many residents suffered from congestion, headaches, throat and lung irritation and other respiratory related issues due to a blanket of LFG and smoke created from the burning landfill. These landfill fires tend to be underground or hidden, and only noticed by the smoke released from the landfill. LFG is harmful to human health and it needs to be taken care of.

00:06:11-00:06:26

[An infographic appears. It shows a landfill atop soil and the groundwater table, with various types of runoff and pollution. An image of a person is shown also being affected by the pollution.]

Anjum: Leachate. Leachate is a liquid formed when water from rainfall or soil moisture filters through landfills. This liquid carries organic material, heavy metals, synthetics and chemicals, viruses and diseases from the waste.

00:06:26-00:07:01

[A screengrab of a page from the IOPScience website is shown. It shows an article titled “Types of Contamination in Landfills and Effects on the Environment: A Review Study.”]

Anjum: Leachate easily passes through and contaminates soil, harming soil ecosystem and water supply. According to a review study done by Irvanian and Ravari, “penetrating leachate to the soil increases soil DOM and causes imbalances in the soil ecosystem. DOM is transported to

water sources through the soil and affects water photochemistry, biological activity, pH of the water”(A Iravanian and Sh O Ravari). DOM stands for dissolved organic matter that exists in leachate, it consists of organic materials derived from decomposed soil matter, plant residues, and...

00:07:01-00:07:16

[An image of a retention pond filled with brown water.]

Anjum: ...matter released by living organisms. When DOM enters soil and water it disrupts the balance in ecosystems and ruins soil and water compositions, such contamination makes the soil and groundwater unusable for agriculture and water supply.

00:07:16-00:07:31

[The screengrab of the page from the IOPScience website is shown again.]

Anjum: The heavy metals in leachate also pose harm to the environment and us, and can be produced “by disposing of various materials such as batteries, consumer electronics, ceramics, light bulbs, and glass...plastics used for food packing or other purposes” (A Iravanian and Sh O Ravari).

00:07:31-00:07:43

[An image of a white pipe. A brown liquid is spilling out of the pipe onto the sloped side of a body of water.]

Anjum: The majority of these heavy metals come from manmade materials, and these heavy metals cause toxicity in the soil and water we use, this poses threat to both the environment and human health.

00:07:43-00:08:03

[The screengrab of the page from the IOPScience website is shown again.]

Anjum: Leachate also contains synthetic substances and chemicals which often come from, “household and industrial chemical wastes such as personal care products, pharmaceuticals, industrial, pesticides, and medicines wastes...food additives such as stabilizers, antioxidants, pigments, as well as food packaging materials” (A Iravani and Sh O Ravari).

00:08:03-00:08:13

[A close up of a pipe from which a brown liquid flows into a larger body of water.]

Anjum: Synthetic substances and chemicals are unnatural and unsafe for the environment and our bodies, so when these enter the soil and water, ecosystems and human health are both at risk.

00:08:13-00:08:28

[The screengrab of the page from the IOPScience website is shown again.]

Anjum: Finally, due to various bacteria, microorganisms and parasites that exist amongst landfills, leachate can contain pathogens and diseases which can infect animals that roam amongst the trash and the people who live nearby.

00:08:28-00:09:12

[An infographic from the Landfill Outreach Methane Program appears. It shows how gases from a specialized landfill can be captured and put to various uses, including electricity, pipeline gas, industrial use, arts and crafts, and vehicle fuel.]

Anjum: Today new technologies are being developed to better waste management at landfills and protect our environment and communities. At some landfill sites, instead of allowing LFG to escape into the air, it is being treated and used as renewable natural gas for energy projects. The Environmental Protection Agency says that this gas is used for projects like electricity, heating, greenhouses, auto manufacturing, chemical production, food and beverage processing, pharmaceuticals, cement and brick manufacturing, wastewater treatment, consumer electronics

and products, as well as paper and steel production (EPA). This use of LFG reduces greenhouse gas emissions and reduces air pollution, making the air more clean and safe for the environment and us.

00:09:12-00:09:36

[An image of a landfill site with industrial storage containers and trucks.]

Anjum: For leachate, some landfill sites transport the hazardous liquid to waste water treatment plants to clear it of harmful contaminants. Now these are solutions that are being used and implemented by the waste management department, but what can we do as individuals? On the individual level, by improving our trash disposal habits...

00:09:36-00:10:06

[An image of four color-coded recycling bins for Paper, Plastic, Glass, and Organic materials.]

Anjum: ...we can help solve this problem too. Recycling is a good step for managing your own trash. At home, recycle your papers, plastics, metals, and glass materials. When you are out make sure to use the recycling and trash bins properly by disposing the right materials into their own bins. This will help prevent reusable items from entering landfills and being wasted. You can also make compost at home...

00:10:06-00:10:54

[An image of a gray bucket from which spill kitchen scraps like banana peels, potato peelings, and egg shells.]

Anjum: by simply disposing of organic waste like branches, dead plants, animal waste and food into an area of dirt. Over time the organic waste will decompose naturally and can then be used to improve soils. There are also ways you can help decrease the total amount of trash created by the country by simply decreasing the amount of trash you produce. You can use reusable items

rather than use-and-throw items. For example, instead of using plastic eating utensils, use metal eating utensils from home. You can also decrease the amount of food you throw away by simply keeping leftovers for later, like bringing them home and putting them in the fridge, rather than dumping them out when you cannot finish. You can also decrease the amount of hazardous substances in your waste by using eco-friendly products. These tend to have green cycle symbols on their packaging.

00:10:54-00:11:00

[An image of two children next to a container labeled with the green recycling symbol. The children are placing recyclable materials, including a plastic water bottle and cardboard, into the container.]

Anjum: These are just some of the many solutions that can be implemented into our daily lives to help solve our landfill problem.

00:11:00-00:11:25

[Images previously introduced now appear on the screen: The flowchart of the person throwing away their banana peel leading to the image of the landfill, reappears on the screen in stages; it is replaced by the digital drawing of the mound of garbage with LFG fumes and green Leachate;

Anjum: The United States has used landfills to make society more sanitary and safe, but the landfills themselves are harmful to the environment and people. Aside from simply taking up space, these landfills create harmful substances such as landfill gas and leachate. These harmful substances cause air, soil, and water pollution, as well as health consequences.

00:11:25-00:11:44

[The digital drawing of the person in the passenger seat of the car reappears.]

Anjum: I know it might sound like I am proposing the removal of landfills, but I am not.

Removing all landfills which in total take up about 2 million acres is rather difficult and a long process, I mean where are we going to take all of that trash? Instead I propose that we improve our landfill systems and individually commit ourselves to better disposing habits.

00:11:44-00:11:47

[The words “Thank you!” are drawn across the screen in purple letters. A smattering of purple is drawn above and below these words in a border.]

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