Water
WORKBOOK

HUMAN ECOLOGY PROJECT
THE PERSONAL IS PLANETARY

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The Human Ecology Project is dedicated to illustrating the connections between human actions and their effects on individual health, society, animals, and environmental impact. The unifying factor is the food we eat.

Water is our history, our past present and our future.

We live in a world of water.

All life on planet earth emerged in the nutrient water of the ancient seas. Without water earth would be a dead planet.

The oceans hold 96% of the world's water

Photosynthesis began more than 2.5 billion years ago, producing oxygen. With the evolution of plants, the atmosphere was created. This oxygen laid the foundation for the creation of an environment that could support complex life. First came single celled microbes and then more than a billion years later, complex organisms. All this exciting and miraculous creation occurred in the waters of the earth.

The modern oceans cover 70% of the surface of earth and hold about 96% of the world's waters. Water also exists within all living creatures - as vapor in the atmosphere and in the deep aquifers beneath the surface.

WATCH THE VIDEO: What About Water?
https://www.youtube.com/watch?v=xspo_Cz-9n8

Water is always moving.

Ocean currents, tidal surge, river flow, and evaporation all keep water in a constant motion. The rotation of the planet, the orbit of the moon, and the gravity of the sun all influence this movement. Together with the photosynthesis of plants this movement aerates water adding oxygen, this enlivens the water and purifys it.

Much of the purification happens as water is allowed to filter through layers of soil, sand, and rock. This is the process that has provided clean and nourishing water for centuries and sustained both plants and animals. Plankton and other sea creatures produce roughly 50% of all the oxygen on earth.[1] If the water is not allowed to complete its journey through the natural process the water is not only contaminated by chemicals but loses its vitality, represented by the levels of acids, metals and oxygen.

The ocean currents act to transport warm water from the equatorial areas of the seas and move them toward the poles. This movement of warm and cold water is a major influence on the global climate. The oceans counteract the uneven distribution of solar heat reaching the Earth's surface.[2] If we think of the soil of the planet as a huge digestive system, the forests and sea plants are the lungs, and the seas and rivers are the circulatory system.

Later we will discuss the implications of clean water and personal hydration but first we must understand the current state of water in the modern world. The body thrives on clean water, if the water is contaminated then whole organ systems fail and life is threatened.

> The important functions of water in creating a healthy planet are now being radically changed by human activity. This is a challenge that cannot be ignored.

WITHOUT WATER

The world is a Dead Planet

1 https://oceanservice.noaa.gov/facts/ocean-oxygen.html

2 https://education.nationalgeographic.org/resource/ocean-currents-and-climate/

The fact that clean water is essential to all life seems lost in the rush to misuse and monetize this valuable resource. We labour under the fantasy that water is anything that is fluid and clear, and that it is in endless supply. The simple fact is that clean water resources are dwindling, we are wasting the water available at an increased rate and that water pollution is increasingly a problem to all animal life.[3]

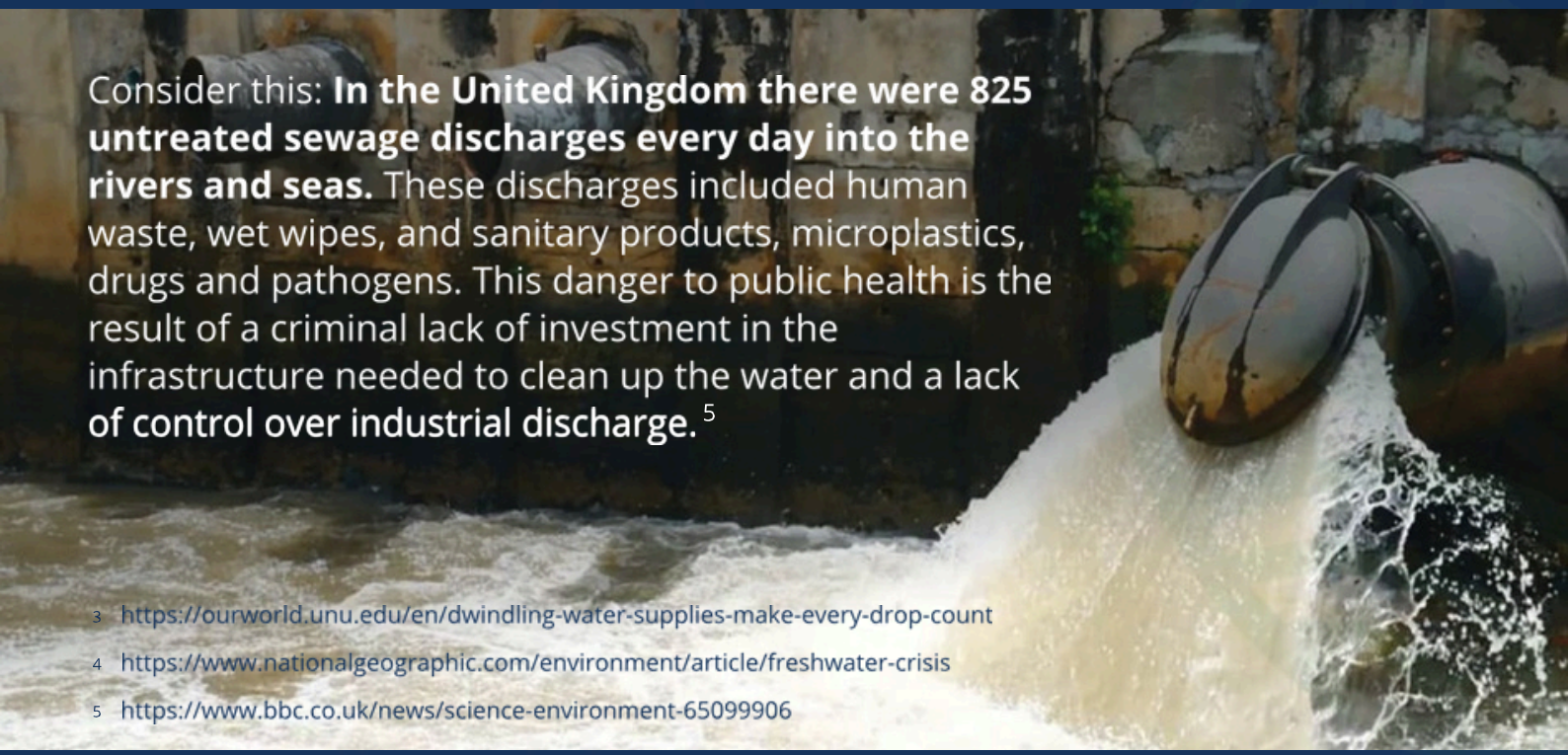
Water pollution occurs when any harmful substance, either chemical or biological degrades the water making it toxic. The incidence and impact of this pollution is vastly under reported.

Our assumption is that this is only a problem of poor countries with an inadequate infrastructure and poor public hygiene, this is a mistake. The issue of clean water is rising in all societies around the world.

Drinkable water sources are finite, only 1% of the worlds freshwater is accessible to us and the danger to this supply is rising at a fast rate.[4]

The most important sources of water pollution are the treatment of human waste, industrial effluent, and agricultural wastes.

The number of people who die from drinking polluted water exceeds the number killed by war and all forms of violence.

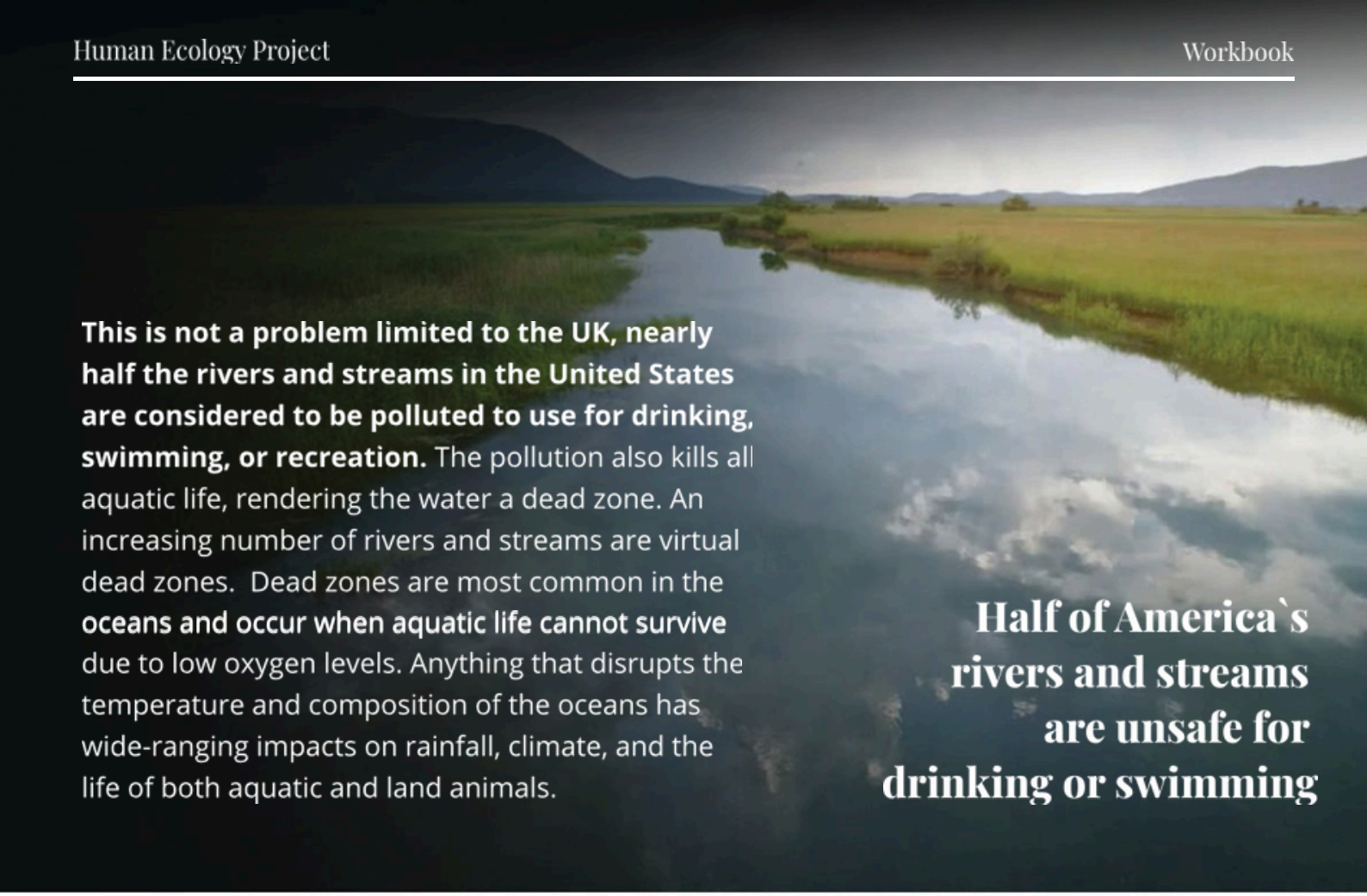


Consider this: **In the United Kingdom there were 825 untreated sewage discharges every day into the rivers and seas.** These discharges included human waste, wet wipes, and sanitary products, microplastics, drugs and pathogens. This danger to public health is the result of a criminal lack of investment in the infrastructure needed to clean up the water and a lack of control over industrial discharge.[5]

3 https://ourworld.unu.edu/en/dwindling-water-supplies-make-every-drop-count

4 https://www.nationalgeographic.com/environment/article/freshwater-crisis

5 https://www.bbc.co.uk/news/science-environment-65099906



This is not a problem limited to the UK, nearly half the rivers and streams in the United States are considered to be polluted to use for drinking, swimming, or recreation. The pollution also kills all aquatic life, rendering the water a dead zone. An increasing number of rivers and streams are virtual dead zones. Dead zones are most common in the **oceans and occur when aquatic life cannot survive** due to low oxygen levels. Anything that disrupts the temperature and composition of the oceans has wide-ranging impacts on rainfall, climate, and the life of both aquatic and land animals.

Half of America`s rivers and streams are unsafe for drinking or swimming

Eighty percent of this ocean pollution is delivered primarily from the rivers and streams that originate from land based human activities. Most arrive in the ocean following runoff from rain and snow as well as direct dumping. Some of the heavy metals such as mercury, lead, pesticides, and pharmaceuticals contaminate water supplies and enter the food chain through aquatic life. Long term exposure to these chemicals can result in hormonal issues, reproductive problems and damage to our nervous systems and kidneys.

The runoff from agriculture should worry us greatly and make us rethink the foods we choose. The concern is with the pesticides, herbicides and chemical fertilizers used in conventional farming, and the waste products of the 80 billion animals raised yearly for human consumption as well as the excessive and wasteful use of water.

Over 3 billion tons of animal manure are produced each year.

This excrement is a major pollutant to both air and water. All this must go somewhere, it doesn't magically disappear, it is flushed in the streams, or it is buried into the soil. The value of this excrement as a fertilizer for plant growth is hampered by the large percentage of pathogens it can contain, these include Salmonella, E. coli, and Listeria monoctogenes. These toxic products are routinely discharged in rivers.

It turns out that human excrement is even more contaminated. It contains the products of unhealthy gut bacteria, pharmaceuticals such as birth control, hormones, drugs, and antibiotic resistant bacteria. Water companies in England discharged raw sewage into rivers on more than 200,000 occasions last year, according to data obtained by the Guardian newspaper.[6]

One of the laws of ecology is that everything goes somewhere. It seems we feel that contaminants such as these examples simply disappear by magic.

As one of the foundational elements of a healthy environment, the relationship between clean water and personal health needs to be appreciated. We are nurtured in our mother's womb, the environment we float in is like the ancient seas we evolved out of. For the first months of our life, we only drink our mother's milk, we are ushered into the world by the waters of life.

Water is an essential nutrient for the body, among its functions are transporting nutrients and oxygen throughout the body, regulating body temperature, controlling heart rate and blood pressure, lubricating joints, protecting organs and tissue, creating saliva, and removing waste and toxins.

Drinking adequate amounts of clean pure water is the best way to receive the best results from a good diet. If the diet lacks proper water, then the kidneys and liver suffer. These organs are also at risk if there is an abundance of either organic or inorganic toxins. As part of the filtering process these organs become a storage for toxins that can produce disease.

Let's start at the beginning with the impact of water on gut health. Since a proper balance of water in body chemistry is so vital, it is important that we understand that simply drinking fluids is not going to provide the best results. Recent research has shown that water is a main contributor to assisting diversity in the gut biome. This is an indicator of greater gut efficiency. The studies went on to show that the source of the water affected the presence of diverse microorganisms.[7]

6 https://www.theguardian.com/environment/2021/apr/19/sewage-island-how-britain-spews-untreated-waste-rivers-sea

7 https://pubmed.ncbi.nlm.nih.gov/34642755/

Plain water is the healthiest option

Pure well water had the most profound influence. Those who drank well water had a more diverse gut biome compared to those who drank bottled, tap, or even filtered water. It seems that drinking plain water is beneficial to the digestive tract as opposed to drinking other fluids. The popular idea that drinking smoothies, flavoured drinks, or tea, coffee or fruit juice for hydration is off the mark. We need water.

Eating a plant-based diet, such as our Human Ecology Diet, adds another link to the issue of gut health and water. Having abundant fibre in the diet allows water to be stored in the intestines, making it easier for the body to self-regulate water needs. Water absorbed by fibre also lubricates the gut and helps in the formation of healthy stools for excretion.

Some common drinks that are problematic to hydration are those that are diuretic, in other words that increase the release of fluids through urination. More than a couple of cups of coffee a day can irritate the kidneys, bladder and increase urination. The most common diuretic consumed is alcohol. Aside from the fact that alcoholic drinks have a high concentration of sugars they are diuretic and undermine good hydration if consumed daily or in excess. [8]

A good thing to know is that proper hydration does not happen in direct relationship to thirst. The most important aspect of hydration happens at the level of the cell. Many people are well along the path to dehydration without being thirsty.

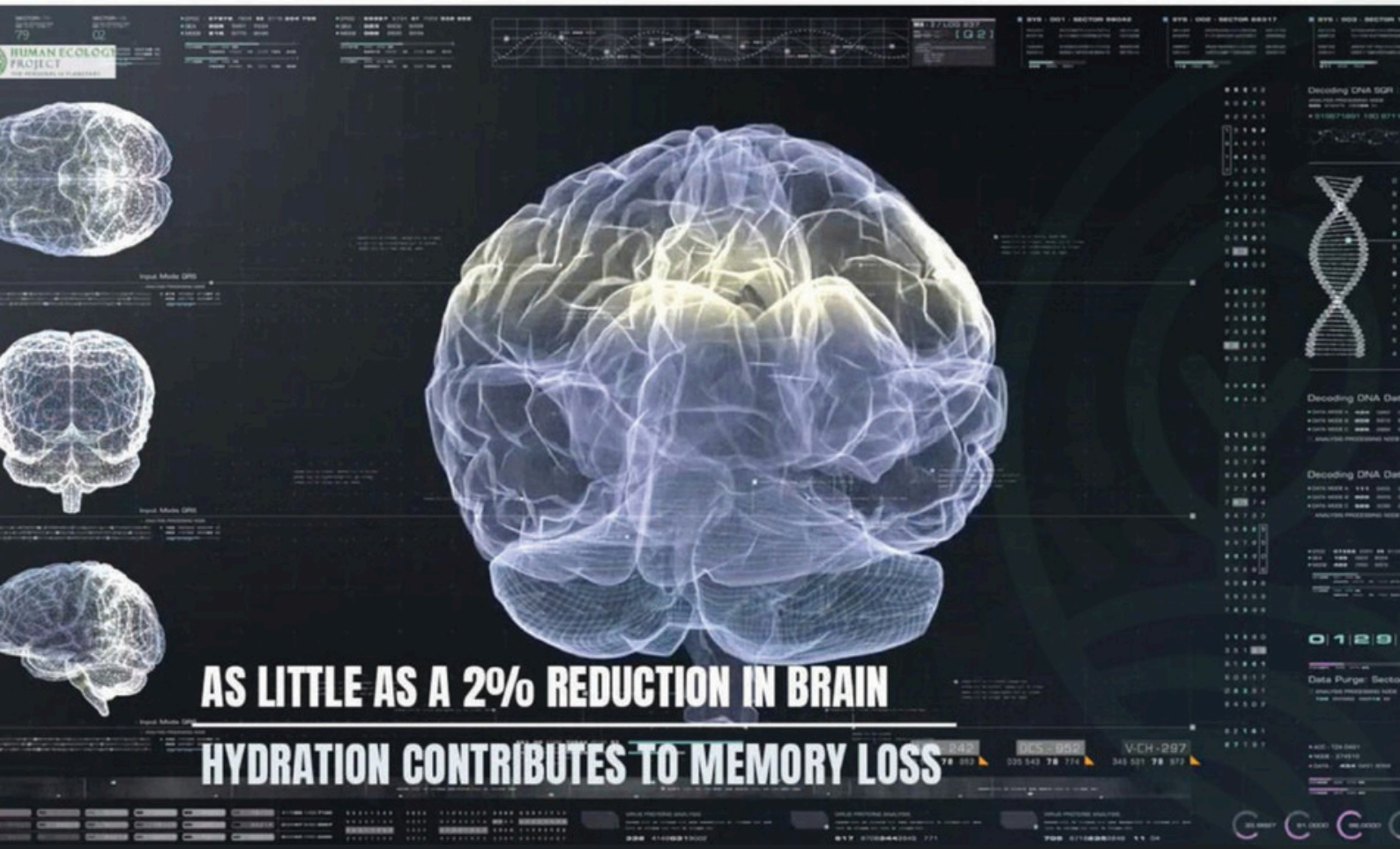
8 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5537780/

The concentration of soluble nutrients in the blood are determined by the level of water. If there is adequate hydration the cell can absorb water to maintain its shape and function.

This has important implications to both body and mind.

- **85% of your brain tissue is water.**
- **2% decrease in brain hydration can contribute to short term memory**
- **Both appetite and thirst may diminish with age**

If you're dehydrated, both your body and your mind will be stressed. Cellular dehydration is most common as we age. As little as a 2% decrease in brain hydration can contribute to short term memory loss and a lack of cognitive function. Both appetite and thirst may diminish with age. Even when your body is craving fluids you might not be aware of it. This is a natural process of ageing. When we start life we have a higher percentage of water, as we age it decreases, we dry out. It is important to keep hydrated for a long and healthy life.



Given the importance of water to our life and the health of the planet we need to be mindful of how **we can help in the conservation and sustainability of this precious resource.** Even though humans around the world need clean water to survive only 1 in 9 people around the globe get it. As far back in 2010, the United Nations recognized that more people were dying from lack of water than from acts of violence including war.[9] The UN declared that "water was a basic human right and that the International Community should" provide safe, clean, and affordable drinking water and sanitation for all" The tragic truth is that water is being **monetised to meet human greed with no thought to the future. One aspect of this threat is** corporate.

The biggest part of the **world's water problem is scarcity**. Of all the water that exists on earth only **2.5 % of that water is drinkable.** Places like Africa struggle to find the monies even to start the necessary infrastructure it would take to distribute sources of water to the people that need it the most. In the United States each person on average uses about 150 gallons of water daily while in **Kenya millions of people survive on less than 5 gallons a day.**[10]

9 https://news.un.org/en/story/2010/03/333182

10 https://www.theworldcounts.com/stories/average-daily-water-usage

TOXIC TAP WATER

Inside Flint`s Lead Poisoning Disaster

Big business has found out that water is the new oil. The valuable resources of water that lie beneath the earth in vast aquafers, are being bought, sold, and drained at a record speed. It is another example of seeing a natural resource as simply a source of financial reward. Researchers found that 44% of all aquifers globally will be fully impacted and depleted because of climate change in the next 100 years due to changes in the intensity and pattern of rainfalls.[11] The largest aquafer in North America is the Ogallala reserve. This vast underground sea stretches from South Dakota into Texas.

In Kansas, about 30% of the aquifer is already depleted, within 50 years it is expected that 70% will be used up. Government policies are encouraging farmers to over produce through the incentive of subsidies. Experts estimate that it would take 6000 years for the Ogallala to be refilled.

Another example of corporate greed eclipses social needs is the city of Flint, Michigan. The citizens of Flint only use tap water to flush their toilets. **The tap water is over 800 times the limit for lead poisoning.** This toxic water greatly impacts not only physical health but also mental functions. It is well known that lead poisoning creates learning difficulties that are not reversible.[12]

Less than 100 miles away, the city of Evart pays the multinational Nestle Company $200 a year to pump the water to fill millions of plastic bottles to sell on the open market. It is important that as individuals we do all we can to keep water under local control and hold services to provide a clean product. [13]

11 https://earth.org/are-we-running-out-of-water/

12 https://www.smithsonianmag.com/innovation/whistleblowers-marc-edwards-and-leeanne-walters-winner-smithsonians-social-progress-ingenuity-award-180961125/

13 https://fortune.com/2017/06/01/nestle-michigan-well-bottled-water/

Of course, the most important way we can affect water availability daily is to look at our personal use of water consumption and particularly the foods we choose to eat. Water is a primary ingredient in the production of all foods whether it is used for growing plants, given to animals, or used in processing. This measurement is called virtual water.

The largest single component of virtual water in our food supply is in the production of animal sourced meat, eggs, and dairy.[14]

Consider these examples:

- **15,400 litres** of water to produce one kilo of beef.
- **1,000 litres** of water to produce one litre of milk
- It takes over **3,000 litres** of water to make a hamburger with cheese, tomato, and lettuce.
- Compare this with **2,400 litres** of water to produce 1 kg of rice – enough to feed eight people.
- Most vegetables use only **300 litres** of water per kilo of food

So once again we see that the food, we choose to eat has a fundamental impact on the health of society and the environment. This is simply another reason why, if we are concerned with the future of the natural world, we want to help create a sustainable environment **for future generations, we need to stop** the killing of non-human life. **70% of freshwater use is for agriculture, we need to pay attention.**

1kg of beef = 15,400 litres of water

14 https://www.statista.com/chart/9483/how-thirsty-is-our-food/

One person who goes vegan can save approximately

219,000 gallons of water a year.[15]

The water that two people could save every year would come very close to filling this tank by simply avoiding the consumption of animal food. Notice how small the people in the picture are.

There are actions to clean up our water supplies that must be done by government and business. We should all be alert and do our best to influence those decisions. Usually, we are told that it is water use in the home that is the problem, that is not the case.

It is food that make the biggest difference.

15 https://www.peta.org/blog/how-to-save-219000-gallons-water-year/

A 1 litre bottle of water takes 5 litres of water to produce

THERE ARE SO MANY ACTIONS WE CAN TAKE DAILY TO HELP
conserve the water resources we have.

WHAT WE CAN DO:

- We have already discussed our water footprint on the food we eat. The solution is simple, remove all meat, dairy and eggs from your diet. You can reference our website for information on eating a healthy vegan diet.
- Let our friends and families know about the changes that need to happen to clean up our water, buy a filter for home use. They come in a variety of construction, price, and effectiveness. Ideally you want one that removes viruses, pharmaceuticals, herbicides, and pesticides as well as heavy metals and foul tastes.
- Buy a portable bottle and take your own water with you. Don't buy plastic bottled water. The amount of water used to pump, manufacture, and distribute means that a one litre bottle of water takes 5 litres of water to produce.
- Try and eat seasonal and local, organic foods as much as possible. Organic and veganic growers do not use the toxic chemicals that leach into local water. Seasonal food saves extra transportation costs.
- Be careful not to flush medications, or household chemicals down the drain or toilet.

- Avoid the use of toxic herbicides and pesticides in home and garden.
- Use biodegradable products for household tasks such as washing dishes and clothes.
- Cleanliness is important but long showers and baths are simply wasteful.
- Our water footprint is impacted by most purchasing decisions we make. Almost all manufactured goods require water use in source materials and manufacturing. The more we disengage from the consumer driven world the more we help in the conservation of our living environment.
- Never pour toxic chemicals or automotive fluids into the storm drains or dump them on the ground.

The undeniable result of our exploration of this issue is that food is central to all the personal, social and environmental problems we face. **The Personal is Planetary is our motto at the Human Ecology Project.** There is much good work to be done and establishing our health makes the work easier and frees up the energy we all need to help in the creation of a healthy planet for humans and non-humans alike.

Possible Discussion Topics

1. **What is your water footprint?**

2. **What actions can you take to save water in your daily life?**

3. **How would you best communicate saving water without being preachy?**

4. **How can you best check the water quality in your city?**

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Human Ecology Project

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