**Articles on Environmental Science**

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**1. Understanding Our Environment**

**Discussion Assignment Unit 1**

**1**. What **environmental concerns** in your local area did you learn about?

**2**. Did they **surprise** you? **Why** or why not?

According to United Nations Statistics Division, China's per capita CO2 emissions were 7 tonnes in 2011, and the number of threatened species reached 1080 in 2015 (2016). These two facts shocked me. The specific reasons are as follows: First, Although China releases a large amount of CO2 every year, the per capita CO2 emission of 7 tonnes is beyond my expectations. Second, with the improvement of environmental awareness, people are paying more and more attention to protecting the environment and wild animals. However, in 2015, 1,080 species of creatures were still on the verge of extinction, which is distressing.

**3**. **What** do you think can be done to **improve** this (these) situation(s), hazard(s), problem(s), or concern(s)?

For CO2 emissions, we can take the following measures: First, try to choose green travel methods, such as taking public transportation and cycling for short distances. Second, use green energy such as solar, wind, and hydro. Third, plant more green plants, which are conducive to absorbing CO2. To protect wild animals, we can take the following measures: First, we can establish more nature reserves to protect the habitat of wild animals. Second, develop policies to avoid over-exploitation and use of natural resources, such as controlling the amount and timing of fish caught.

**4**. Give **two interesting facts** that you learned about your country from the Environmental Snapshots page at the UN Statistics Division link.

From the Environment Statistics Country Snapshot, I got two interesting facts: First, in 2014, China's GDP growth rate from the previous year reached 7%, and the GDP per capita (at current prices - $US) was 7617, which sounds good for a developing country (United Nations Statistics Division, 2016). However, the average GPD is not a good measure of people's income because the uneven distribution of wealth is still severe. In other words, a small number of people hold most of the wealth, and many people are at low-income levels. Second, the population of China reached 1,376,049,000 in 2015 (United Nations Statistics Division, 2016), which is an exciting number because the large population provides the society with a large amount of labor and a thriving consumer market, thereby promoting economic development. However, the vast population also greatly pressures the environment and resources. Therefore, coordinating economic development, environmental protection, and social progress is essential.

**5**. What other **thoughts** would you contribute to the topic?

The thought I want to conduce to this topic is about climate extremes, and we need to take some decisive action immediately. For example, Pakistan experienced severe floods a few days ago, and one-third of the country was flooded (BBC News, 2022). Another example is last month's severe wildfires and rare drought in Chongqing, China (BBC News, 2022). Faced with these increasingly mundane occurrences of extreme weather, humans should take measures to protect the environment timely. Precisely, at the national degree, the government can specify laws and regulations and vigorously develop clean energy. At the individual level, people can choose green travel and save electricity. In conclusion, through our joint efforts, I believe that we can build a sustainable world together.

Word count: 534

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**Learning Journal Unit 1**

**1. Write a brief introduction of yourself in the Learning Journal.**

Dear Professor, I am pleased to start this exciting journey with you and all my classmates. I appreciate it. I am from Nanjing, China. My personality type is INTJ. In other words, I am an Introverted, Intuitive, Thinking, and Judging person. I have a strong interest in data science and artificial intelligence and therefore chose to pursue a degree in computer science at UoPeople. It is currently my 6th semester. In addition, I am interested in political science, especially the transition from socialism to democracy.

**2. Explain why you took this course and what you hope to learn from it**.

The reason I took this course was to learn something about environmental protection so that I could work and live sustainably. Specifically, I want to know the following knowledge: First, I want to learn about biological conservation. According to United Nations Statistics Division, China has 1080 species threatened with extinction in 2015 (2016), which is shocking and saddening. So I want to be equipped with some skills to protect biodiversity and thus do something within my power. Second, I want to master something about climate protection. Extreme weather has frequently occurred recently. One-third of Pakistan's territory was flooded a few days ago, and China's Chongqing experienced unprecedented drought and forest fires. The occurrence of these abnormal climates may be related to global warming. Therefore, I want to know how to stop or slow climate change. Third, I want to learn about sustainable development, especially how to protect the environment scientifically while promoting economic development and social progress. For example, China's GDP growth rate from the previous year reached 7% in 2014 (United Nations Statistics Division, 2016), but CO2 emission also ranks first globally. Coordinating economic development and environmental protection is an issue that the Chinese government urgently needs to solve, and it is also the responsibility and obligation of each of us.

**3. Please describe, in detail, some of the major environmental issues in your local village/community/town/region/nation. What are they? Why are they an issue? Do you know of any current actions to deal with it?**

China's most severe environmental problem is that coal-fired power plants emit large amounts of greenhouse gases and particulate matter when burning coal to generate electricity. According to Hsu, China's coal-fired power plants account for 40% of the world's total (2018). These coal-fired power plants release plenty of greenhouse gases such as CO2 and particulate matter 2.5 every year, which will cause air pollution and climate warming. Fortunately, the government has taken some steps to alleviate the problem. First, the government shut down some small coal mines and, at the same time, restricted coal consumption. For example, China has waged war on coal since 2014 (Hsu, 2018). Secondly, the government is also vigorously developing clean and renewable energy, including hydropower, wind, and solar. For example, China's hydropower and wind power account for 30% of the global total (Hsu, 2018). In conclusion, although we are facing increasingly serious environmental problems, I believe that we can build a sustainable and green world through our joint efforts.

**4. If you were to implement one, small, simple project in your local area or family in support of the environment, what would it be? Why?**

If I were to complete a project to support environmental protection, I would do a waste sorting knowledge-sharing activity. Specifically, I will print some posters explaining the benefits of garbage sorting and the ecological harm of not sorting it. Then I will promote it in the community where I live. Here's why I do this: Specifically, the community I live in has a garbage-sorting recycling facility that has different types of trash cans, such as kitchen waste, recyclables, and non-recyclables. However, because people's environmental protection awareness is not high enough, some do not sort the garbage when they throw it. Instead, they toss the garbage into the same trash can. Therefore, by sharing the knowledge of waste sorting, I can raise people's awareness of environmental protection, so that waste sorting can be genuinely done, thereby supporting environmental protection.

**5. One or two sentences of your own personal reflection on something you learned this week.**

Through this week's study, I recognized the importance of sustainable development and learned about the environmental problems and corresponding protection measures shared by students from different countries. Simultaneously, I realized the issues with China's energy system. Hopefully, shortly, we can build a sustainable world through our joint efforts.

Word count: 748

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**2. Ecology and Sustainability**

**Discussion Assignment Unit 2**

**1. Which biodiversity hotspot did you choose to write about? (Give the name)**

**2. Where is it located? (Give the world, region and country)**

After doing some research, out of 36 Biodiversity Hotspots, I chose the hotspot, namely the [Mountains of Southwest China](https://www.cepf.net/our-work/biodiversity-hotspots/mountains-southwest-china), which is the closest to where I live now. As the name suggests, it is located in China. More precisely, “it stretches from southeast Tibet through western Sichuan and extends into central and northern Yunnan” (CEPF, n.d., para. 1). Due to its unique landform, this hotspot is the temperate forest ecosystem with the most abundant plant resources in the world (CEPF, n.d.).

**3. What are two important species (give common and scientific names) that live there? Why are they important?**

According to statistics, the Mountains of Southwest China have more than 12,000 species of plants and more than 230 mammal species (CEPF, n.d.), of which the two most important are **the vulnerable giant panda (Ailuropoda melanoleuca)** and **vulnerable snow leopard (Panthera uncia)**. The reasons why they are essential are as follows: First, the giant panda and snow leopard are the world's best-known mammals (CEPF, n.d.). Especially the giant panda is not only an animal but also a symbol of the warm and friendly ordinary Chinese people. Second, like any other species, their presence is integral to biodiversity. It is the rich biological system that provides human beings with water, air, and food so that humans can survive. Therefore, the giant panda and snow leopard are essential.

**4. What is one endangered species (give common and scientific name) that lives there? Why is it endangered?**

According to CEPF, the Chinese forest musk deer (Moschus berezovskii) is endangered for two main reasons (n.d.). First, illegal hunting and the trade of wild animals are important reasons. Specifically, the Chinese forest musk deer has been subjected to many unlawful killings due to insufficient funds for many protected areas and law enforcement units, resulting in the inability to effectively enforce wildlife protection laws (CEPF, n.d.). Second, excessive logging leads to habitat fragmentation and degradation. Concretely, before logging was banned, the residents collected the fuelwood from the local area, and "the average household required 10-30 cubic meters of fuelwood per year" (CEPF, n.d., para. 8 ). Therefore, logging has caused unavoidable damage to the habitats of animals.

**5. List three other interesting facts that you have learned about this place.**

According to the CEPF report, I found the following three interesting facts. First, the Mountains of Southwest China have more than 12,000 plants, accounting for 40% of the species in China (n.d.), which surprised me. Second, more than 230 kinds of rhododendrons are found here, accounting for more than a quarter of the world's rhododendron species. Remarkbaly, some rhododendrons can grow to 20 meters or more (CEPF, n.d.). Third, some amphibians here live at very high altitudes. For example, the Xizang alpine toad (Scutiger boulengeri) lives more than 5,000 meters above sea level (CEPF, n.d.), which is surprising.

**6. List one thing you feel could be done to help save it.**

Establishing "effective nature reserve and community resource management" (CEPF, n.d.) is one way to save them. Specifically, nature reserves can provide animals with suitable habitats and minimize the impact of human activities on them. Simultaneously, community resource management can regulate the development and collection of local natural resources and avoid over-exploitation leading to resource depletion and habitat degradation, thereby protecting them.

Word count: 569

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**Learning Journal Unit 2**

**1. Are any of these options and/or types of programs available in YOUR local community/village/town? Which ones? Explain.**

In the community I live in, there is a program about reuse. Precisely, recycling bins for old clothing are placed in the community. After residents put unwanted clothes into the boxes, relevant personnel will sort them and distribute them to those in need. As a result, the program can help people who need these closes and “reduce the amount of waste that needs to be recycled or sent to landfills and incinerators” (Environmental Protection Agency, 2022, para. 2).

**2. What about in your home? Explain.**

At home, I can use the following tips to reduce, reuse, and recycle materials to support the environment. First, it is a good attempt to turn off unnecessary lights promptly and avoid turning down the air conditioner too low on hot days, as it saves energy. Second, rechargeable batteries or disposable ones with low mercury content are also good options (Environmental Protection Agency, 2022). If used batteries are not handled correctly, they will pollute water resources. Therefore, avoiding using batteries with high mercury content can reduce environmental pollution, especially water contamination. Third, I will take only the amount I need when using cleaning products. In addition, for the rags and sponges used in the kitchen, I will try to buy reusable ones (Environmental Protection Agency, 2022). Fourth, saving water is never out of date. For instance, I would adopt the faucet with a more soothing flow and apply the water used to wash vegetables to irrigate flowers.

**3. If none are used in your local town or home, which could be? Explain.**

Although in my community and at home, there are already some measures of reducing, reusing, and recycling, it is not enough, and we can do better. For example, a good recycling measure in our community is classifying garbage. Still, people do not put the trash into different garbage bins according to the categories or don't sort the waste properly at home. As a result, all kinds of garbage are mixed, which is inconvenient to handle and recycle. There are two main reasons why people do this. First, they do not realize the benefits and importance of garbage sorting. Conversely, they may feel that sorting garbage is a bit troublesome. Second, people are not motivated to sort their waste because sorting or not has little effect on them. Therefore, we can promote garbage classification from the following aspects. First, government departments or community management committees should strengthen publicity and education to cultivate everyone's awareness of garbage sorting. Second, establish reward and punishment measures. Give specific encouragement and rewards to those who are actively classified to mobilize everyone's enthusiasm.

**4. Please outline in your own words, one new thing you learned this week in the course. How does it apply to your life?**

An interesting new thing I learned this week is how to compost at home. Environmental Protection Agency (EPA) says we can do backyard or indoor composting. Remarkably, "a properly managed compost bin will not attract pests or rodents and will not smell bad" (2022, para. 8). Specifically, a good compost pile requires three essential ingredients: Browns, Greens, and Water. To be more specific, Browns refer to dead leaves, branches, and twigs, and they can provide carbon for compost piles; Greens include grass clippings, vegetable waste, and fruit scraps, and they can offer nitrogen for compost piles; Water supplies moisture for decomposing organic matter (EPA, 2022). we should note that not all items can be composted. For instance, the following items are not suitable—first, dairy products, such as milk, yogurt, and eggs. Second, fats, grease, lard, or oils. Third, meat or fish bones and scraps. All the matters will produce unpleasant odors and attract pests such as flies (EPA, 2022).

**5. Tell me, the professor, how this course is going for you so far? How do you find the material?**

So far, my experience with this course has been pretty good. First, the reading materials in the class were all great, and I learned a lot of new knowledge. Specifically, in the first week, I learned about sustainability and the UN sustainable development goals. Through the discussion assignments, I learned about the specific environmental problems faced by different countries. In the second unit, I learned about hotspots and how to protect the ecology of these places. Second, the professors of the course also gave a lot of support. For example, the video provided in the comments section of the first week was beneficial and made me realize the shortcomings of China's energy system. In short, through the reading materials provided by UoPeople and the videos supplemented by the professor, I have a deeper understanding of environmental protection and want to work and live sustainably.

Word count: 716

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**3. Evolution and Sustaining Biodiversity**

**Discussion Assignment Unit 3 - Evolution and Sustaining Biodiversity**

**1. What did you choose to cover? Please list the main link to the park/reserve/organization**.

**2. Where is it located?**

I chose [Hongshan Forest Zoo](http://www.njhszoo.com/) in Nanjing, China, which is closer to where I live. Here is the link to the website：<http://www.njhszoo.com/> . As the name suggests, this zoo is located in Nanjing, China, covering an area of 68 hectares, with a green coverage rate of 85% and more than 260 species of rare animals.

**3. What is its mission?**

Hongshan Forest Zoo's purpose is to educate the public and contribute to society (Hongshan Forest Zoo, n.d.). Specifically, Hongshan Forest Zoo not only does an excellent job in conserving wild animals in the park but also actively carries out the shelter and rescue of wild animals in the surrounding areas. In addition, Hongshan Forest Zoo is a popular science education base in China. It actively pursues various public education projects to cultivate people's empathy, love, and gratitude for nature and life and enhance the public's awareness of protecting wild animals and the ecological environment (Hong Forest Zoo, n.d.).

**4. Is there a sustainability development program in your local area that you are aware of? Describe the protected areas that are covered in such programs if any.**

Chinese environmentalists launched a project called Conservation of Fireflies in Nanjing, China, and established a firefly sanctuary in Nanjing's Zijin Mountain. Specifically, due to the good ecological environment of Nanjing Zijin Mountain, many fireflies will shine in the forest every summer. It seems to be in the fairy tale world described in Hayao Miyazaki's cartoons at night. However, as more and more people come to Zijin Mountain to watch fireflies, human activities significantly impact them. For example, the light source people carry affects their breeding activities at night, and the behavior of children catching fireflies also affects them. As a result, many environmental enthusiasts and relevant government departments established firefly sanctuaries and took some necessary protection measures to protect these fireflies.



Fireflies in Zijin Mountain (Chen, 2018)

**5. How are human actions related to the problems they are working on?**

Environmentalists have taken many measures to protect these fireflies: First, plant firefly-friendly plants in reserve, such as low grasses. Doing so can provide a suitable living environment for fireflies. Second, limit vehicles entering the reserve during the firefly blooming season. Doing so will prevent vehicle lights from interfering with firefly reproduction. Third, water the environment where the fireflies grow during the dry season. This is because fireflies mainly feed on earthworms and snails, but these animals only appear in humid climates. Therefore, in the season of continuous drought, proper watering can let these small animals out, and the fireflies can find food.

**6. In what ways could You participate in this project/reserve/organization you are reviewing?**

To protect these fireflies, I can do the following things. First, try not to disturb them during their breeding season. The primary reason for the sharp decline in fireflies is the interference of human activities. Hence, reducing the impact of my actions on them is a protective behavior. Second, I will not turn on the light source when viewing them. In reserve, some tourists may turn on their mobile phones or electric lights, and these light sources will cause damage to the fireflies. Therefore, avoiding turning on my phone and flashlight is also necessary protection for these pixies. Third, I will help spread knowledge about protecting fireflies. For example, blogging and sharing relevant knowledge online can increase people's awareness and protection of fireflies.

Word count: 586

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**Learning Journal Unit 3**

**1. Of the different kinds of ecosystem services you learned about, discuss two that are important in your local area, village, forests and/or nation.**

According to the Ecological Society of America (ESA), ecosystems provide us with many invaluable services that humans take for granted, including "pollinating crops and natural vegetation, purifying the air and water, controlling agricultural pests, mitigating drought and floods, detoxifying and decomposing wastes, moderating weather extremes and their impacts, etc." (n.d., para. 3). For the city I live in, purify the air and control pests are paramount. Specifically, in the autumn and winter every year, there will be smog in the city where I live. Thanks to the air's ventilation and the air's purification by the green vegetation in the city, this smog will disappear after some time. Therefore, the air purification service provided by the ecosystem is essential for us. In addition, my city has many artificial green forests. However, these plantations have single vegetation and are prone to insect pests. However, thanks to the release of some birds, the infestation is rare. Therefore, controlling pests is also a vital ecosystem service for us.

**2. How are these services endangered and what economic costs to society do you foresee with their loss?**

In recent years, the ability of ecosystems to purify air and control pests has deteriorated. First, due to the city's continuous expansion, much original vegetation has been replaced by buildings, leading to the decline of green vegetation coverage and the weakening of the air purification ability. For example, plenty of small particles are suspended in the air every autumn, and many people have to buy air purifiers, which they did not need before. Therefore, people plant many trees on both sides of urban roads to increase the city's greening, thereby improving the air quality. Second, the original vegetation was destroyed, and the artificial greenery planted later was of a single type, leading to insect pests. For example, my community has a road full of camphor trees. However, the trees were overgrown with pests, and they almost gnawed the tree leaves last summer. Moreover, the excrement of insects covered the roads on both sides under the trees, causing great trouble for pedestrians. Therefore, people put a lot of birds in the area, hoping to alleviate the damage caused by insect pests.

**3. What is one action that people could take to help protect these services?**

One of the most straightforward measures to protect these services is to care for animals and plants, which can be done from the following aspects. First, grow green plants. Green plants can absorb carbon dioxide and release oxygen, significantly improving air quality. Second, caring for animals and rejecting illegal capture and trade. For example, do not catch and harm birds. Because these birds can catch pests, they are the right hand in pest control. Third, raise awareness of caring for animals and plants. People can continue to enrich their knowledge in this area and help others develop such a concept. As a result, everyone can work together to protect the ecological services to work and live sustainably.

**4. One or two sentences or your own personal reflection on something you learned this week.**

This week I learned the mechanics of evolution, the importance of biodiversity and its threats, and the ecosystem's invaluable services to humanity (UoPeople, n.d.). Remarkably, humans would lose all kinds of these precious ecosystem services without biodiversity. In this case, the water, air, and food will also disappear. Therefore, protecting biodiversity is essential for the sustainable development of human beings.

Word count: 593

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**4. People and the Environment**

**Discussion Assignment Unit 4**

**1. What is this report about?**

As the report's title suggests, the report is about the Millennium Ecosystem Assessment, which assesses the impact of ecosystem change on human well-being and specifies how to take actions to protect ecosystem services for sustainable development. Specifically, it includes the following four aspects. First, it introduces various ecosystem services and explains why ecosystems are important to human well-being. Second, it describes ecosystem changes and their impact on human health. Third, it suggests actions that people can take to address the impact of these changes on human health and proposes the priorities for these actions. Fourth, it includes the policy implications of ecosystem changes threatening health (World Health Organization, 2005).

**2. List two new things you learned from reading this report. What are they? Explain them.**

I am impressed with these two new things learned in the report. First, the ecosystem includes services regulating infectious diseases. Specifically, infectious agents, such as viruses, bacteria, and parasites, are "usually constrained geographically and seasonally by ecosystems and ecological relationships in nature" (World Health Organization, 2005, p. 4). In other words, ecosystems have a moderating effect on disease infection. However, "human-induced changes in the ecosystem and physical environmental conditions can alter these natural effects on the range and activity of infectious agents" (World Health Organization, 2005, p. 4). As a result, these infectious agents may be transmitted to humans. Hence, protecting the ecosystem is critical. Second, there are two ways to deal with ecosystem changes: mitigation and adaptation. Concretely, mitigation means "reducing or reversing the change process, while adaptation implies taking advantage of the beneficial consequences of these changes" (World Health Organization, 2005, p. 4). Mitigation is vital, but adaptation also plays an important role in handling ecosystem change.

**3. What two actions would you take to reduce the threats to human health and life from one of the infectious diseases listed in Table 1.1 (page 24)?**

I can see from the table that schistosomiasis is distributed in America, Africa, and Asia and correlates significantly with ecological change. According to CDC, one can take two effective steps to prevent schistosomiasis, including drinking safe water and avoiding swimming in freshwater where schistosomiasis occurs (2020). Therefore, I would take the following two actions to reduce the harm of schistosomiasis to people's health. First, I will spread knowledge about preventing schistosomiasis, such as telling people to boil water and cool it before drinking it. Second, I will help clean up snails from polluted water sources, as they are the intermediate hosts of schistosomiasis.

**4. List one question that you would like to have answered as a result of reading this report.**

One question I want to answer is: Why is the ecosystem important for human health? Specifically, ecosystems provide human beings with various ecological services, including fresh water, food, timber, fiber, fuel, and biological products. Additionally, ecosystems can supply cultural, spiritual, and recreational services. Furthermore, it is vital in regulating infectious diseases and climate (World Health Organization, 2005). Therefore, ecosystems are important for human well-being, and we need to improve the sense of protection and work and live sustainably.

Word count: 517

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**Written Assignment Unit 4: Reduce Impacts on the Carbon Cycle**

University of the People

ENVS 1301 Introduction to the Environmental Sciences

Lizbeth Gonzalez-Gomez, Instructor

September 28, 2022

Written Assignment Unit 4: Reduce Impacts on the Carbon Cycle

The carbon cycle is one of the most common cycles in nature. For instance, plants convert carbon dioxide gas into organic carbon through photosynthesis, and biological respiration consumes organic carbon and releases carbon dioxide gas into the atmosphere (Doršner, 2020), thus forming a typical carbon cycle. However, with the increasing frequency of human activities, such as the massive exploitation and combustion of fossil fuels, a large amount of organic carbon is turned into carbon dioxide and released into the atmosphere, which has a great impact on the carbon cycle, global climate, and human lifestyle.

Unexceptionally, how I live daily greatly impacts the carbon cycle. First, I need to consume some carbohydrates daily for energy and release a certain amount of carbon dioxide through respiration. Second, the daily electricity I use for lighting and heating will also increase carbon dioxide emissions. Specifically, most of China's electricity comes from coal-fired power plants (Hsu, 2018), and the combustion of these fossil fuels converts long-term organic carbon stored in the ground into carbon dioxide gas. Third, I consume water daily when washing clothes, cooking, and bathing. Before this water enters residents' homes, it needs to be purified and disinfected by water plants, which also consumes a lot of energy and increases carbon dioxide emissions. Fourth, the means of transportation I travel every day also need to burn a lot of gasoline, which releases a lot of gas, including carbon dioxide. Among these behaviors, I think electricity consumption and burning fossil fuels in transportation greatly impact the carbon cycle.

I can make the following changes to reduce my carbon footprint and thus reduce my impact on the carbon cycle. First, save electricity, such as turning off unnecessary lighting, and don't adjust the air conditioner's temperature too low in summer. In this case, I can reduce the carbon dioxide released by generating electricity. Second, adopt a green travel mode. For example, short trips can be made by bicycle, and long trips can be made by public transport instead of a car. As a result, the carbon dioxide released by burning gasoline can be reduced. Third, save water. For instance, when washing dishes, I will not turn on the faucet all the time. Instead, I will only open it when needed. I will also reuse the water used for washing vegetables instead of dumping it directly. Fourth, avoid food waste. Because food production, transportation, and sales consume a lot of energy, which will also increase carbon emissions. Fifth, classify waste objects and recycle some reusable items. For instance, I will not throw away disposable plastic bags after shopping, and I can use them again the next time I trade. By practicing these actions, I believe I can live in a more environmentally friendly way, thereby reducing my negative impact on the carbon cycle.

While reducing the impact on the carbon cycle is necessary, balancing personal choices with environmental considerations requires some effort. First, sometimes it's more convenient to drive a car than public transportation, such as a bus or subway. Because taking public transport often takes a while to wait, and driving yourself can go at any time. However, to reduce my carbon footprint, I will try to choose a green way to travel. Second, when reusing some waste items, I must resist the temptation of new products. For example, when a new iPhone is launched, some people will choose to replace the old phone, even though their phones are still functional. However, I will try to consume rationally and avoid unnecessary expenditures. Third, saving electricity can sometimes be a bit of a challenge. For example, when it is very hot in summer, people tend to adjust the air conditioner's temperature lower to enjoy the coolness and comfort. Nevertheless, I will try to set the temperature to a suitable value to save energy and reduce carbon emissions. In short, although reducing the impact on the carbon cycle requires us to make some changes in our lifestyles, these adjustments are worthwhile because they can help us work and live sustainably.

In conclusion, the daily lighting, heating, shopping, and travel will all impact the carbon cycle, and reducing these influences requires us to replace some of the original lifestyles with green habits. Although these changes can sometimes cause some inconvenience, to alleviate the increasingly serious environmental problems, I am willing to start by myself, work and live in an environmentally friendly way, and thus contribute my share. I believe that through our joint efforts, we will build a green and sustainable world.

Word count: 753

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**Learning Journal Unit 4 - People and the Environment**

**1. What kind of labels are listed here? Why?**

The author lists 9 of the most reliable and respected ecolabels, including USDA Organic, Fair Trade Certified, Marine Stewardship Council, Green Seal, Energy Star, Forest Stewardship Council, LEED, Rainforest Alliance Certification, and Certified Wildlife Friendly. Specifically, some ecolabels are for food safety, such as USDA Organic for organic food. Besides, some ecolabels are used to certify environmentally sustainable development. For example, Marine Stewardship Council certifies seafood from sustainable fisheries, and the Forest Stewardship Council certifies products that do not damage forests’ biodiversity and productivity (Cho, 2011). Furthermore, there are also ecolabels for energy saving, such as Energy Star, which certifies energy efficiency products.



Nine of the most reliable and respected ecolabels (Cho, 2011)

**2. How do your consumer (buying) choices affect biodiversity?**

Biodiversity is vital to humanity because it provides invaluable ecosystem services, including water and food. My purchasing choices below are conducive to protecting biodiversity. First, buy items with biodiversity-friendly labels (UNCTAD, 2019). As shown in the image above, these labels indicate that these products are organic, fair trade, or environmentally friendly. Therefore, purchasing these products is beneficial for protecting biodiversity. Second, avoid endangered species products. Specifically, when buying, identify the source of the product's ingredients and ensure that the product is not made from protected animals and plants—for example, purchasing products with the [CITES](https://cites.org/eng/disc/how.php) permit and other relevant permits (UNCTAD, 2019). Third, cut back on meat and dairy foods. Because "90% of the world's rich biodiversity lands will be cleared for agricultural purposes due to increased demand for meat and dairy" (UNCTAD, 2019, para. 11). Therefore, eating less meat and dairy products can preserve biodiversity.

**3. Pick one of these methods that you feel would be usable in YOUR city/village/town. How? Explain.**

In my city, perhaps the most effective biodiversity-saving purchase option is to reduce meat and dairy consumption. The specific reasons are as follows. First, due to the lack of awareness of biodiversity protection, many of our products do not have ecolabels, so it is not easy to select products based on ecolabels. Second, consumer products generally do not involve goods made from protected or endangered species, so avoiding consuming such items is not very helpful. Third, in daily life, most people consume meat or dairy products every day. According to UNCTAD, reducing the consumption of these foods can prevent biodiversity lands from becoming agricultural fields (2019), thus preserving biodiversity.

**4. One or two sentences or your own personal reflection on something you learned this week.**

This week I learned more about the invaluable ecological value that ecosystems provide to humans and the impact of ecosystem changes on human health. In addition, I comprehend the implications and values of biodiversity and ways to protect it. Finally, I understand the factors that affect food safety and some agricultural biotechnology, such as genetic engineering.

**5. How is the class going so far for you?**

So far, the course experience for me has been excellent. Specifically, the readings in the discussion and written assignments were helpful and expanded my understanding of the subject. For example, the report of the Millennium Ecosystem Assessment in this week's discussion assignment gave me a solid understanding of the impact of ecosystems on human health. Additionally, thanks to weekly discussions, written assignments, and learning journals, I could document my thoughts in writing, which deepened my understanding of the topics of each unit. Finally, reading submissions from fellow students and the feedback from the professor broadened my horizons and helped me do better reflection. Overall, the course experience is highly satisfactory. I appreciate it.

Word count: 598

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**5. Sustaining Energy Resources**

**Discussion Assignment Unit 5**

**1. What does the term “renewable” mean?**

According to the office of Energy Efficiency & Renewable Energy (EERE), renewable energy is a naturally replenished and inexhaustible energy source. Therefore, renewable means not running out or can be replaced. Common renewable energy includes bioenergy, geothermal energy, hydrogen, hydropower, marine energy, solar energy, and wind energy.

**2. Which two renewable energy forms did you choose?**

I choose wind and solar energy. Both wind and solar energy are sustainable energy sources that can be converted into electricity. Specifically, wind energy can be converted into electricity by wind turbines, and sunlight or solar radiation can be converted into electricity by photovoltaic (PV) panels.

**3. For each, describe two benefits**.

Wind and solar energy have many advantages. For wind energy, it has the following two outstanding benefits. First, it is a clean and renewable energy source because using wind energy to generate electricity does not produce air pollution. According to EERE, using wind energy reduces the burning of fossil fuels, which helps reduce emissions of 329 million metric tons of carbon dioxide annually in the United States (n.d.). Second, wind energy is cost-competitive. For instance, the price of energy produced using utility-scale wind turbines is lower than that of many conventional energy sources (EERE, n.d.). For solar energy, it has the following two salient pros. First, solar energy is also a renewable and clean energy source. As long as the sun exists, people can use solar energy to generate electricity anywhere in the world. Second, the maintenance cost of a solar system is low. According to Vourvoulias, the solar system only needs to be cleaned a few times a year, and there is no need to replace parts because there is no wear and tear (2022). Therefore, the solar system requires low maintenance costs, which is a spotlight of wind energy.

**4. For each, describe two drawbacks.**

Wind and solar also have some disadvantages. For wind energy, it has the following two cons. First, ideal wind farm sites are usually located in remote areas, with certain challenges in transmitting electricity from wind farms to densely populated areas. Second, wind farms can affect local wildlife. Although rational wind farm site selection can reduce the impact on wildlife, influences still exist. For solar energy, it has the following two drawbacks. First, it is weather-dependent. Specifically, there is less sunlight on rainy, cloudy, or nighttime days, so the solar system's efficiency decreases (Vourvoulias, 2022). Second, solar energy storage is expensive. Concretely, solar energy needs to be used immediately. If one wants to use solar energy at night, a feasible method is to store the solar energy generated during the day into a battery and use it in the evening. However, storage batteries are also expensive (Vourvoulias, 2022).

**5. Which of these you feel would best serve your community? Why? Explain.**

Solar energy is supposed to serve my community the best. The specific reasons are as follows. First, the place where I live has sufficient sunlight every year. If installing the solar energy system, one can utilize the solar energy efficiently. Second, the maintenance cost of the solar energy system is very low. Therefore, after installing it, the community does not need to worry too much about subsequent repairs and maintenance. Third, there are many scenarios in the community that are suitable for utilizing solar energy. For example, the squares and roads of the community are ideal for installing solar panels so that solar energy during the day can be converted into electricity for lighting at night. In addition, many residential buildings have solar water heaters installed on the roof so that people can heat that water for showering, washing, etc.

**6. According to the WWF Energy Report prepared by WWF and Ecofys, “by 2050, we could get all the energy we need from renewable sources.” What is your response to this statement?**

It is exciting and aspirational to see the statement that it is possible to use only renewable energy by 2050. Specifically, before 2050, if traditional power cannot be replaced by renewable energy, the escalating adverse effects of climate change on humanity will be inevitable (WWF, 2011). Fortunately, the transition to a fully renewable energy supply is achievable technologically and economically, although humans must overcome many challenges. Therefore, it is hoped that the government and businesses will pay more attention to the transition from traditional energy to clean energy and work together to overcome these difficulties and create a sustainable future.

Word count: 744

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**Learning Journal Unit 5**

**1. Summarize, in Your own words (do not copy from the website) two of the methods for sustainable agriculture from “**[**Solutions: Advance Sustainable Agriculture: Using science-based practices, we can produce abundant food while preserving our soil, air and water**](https://www.ucsusa.org/food/sustainable-agriculture#.Vjs4KijGbnc)**” including all hyperlinks used.**

Many science-based practices can help achieve sustainable agriculture. These approaches aim to improve soils and increase diversification (Union of Concerned Scientists, 2022). Therefore, I summarize a typical method of improving soil and a standard way of growing diversity. First, planting cover plants during the off-season benefits soil health. Specifically, the cultivation of cover crops, such as clover, can avoid soil leakage during the off-season, thereby avoiding soil erosion, maintaining nutrients, and keeping soil healthy. Second, intercropping is beneficial for increasing diversification. Concretely, growing multiple crops in the same area can help reduce pest infestations and generate economic benefits. For example, in my hometown, people put watermelons in cotton fields, and both crops grow vigorously, adding income and increasing diversification simultaneously.

**2. List one method that you think would work well in your local village/town/region. Why would it work well? Explain.**

Crop rotation might be the best option here. Because crop rotation has many advantages, it can help farmers overcome the difficulties of achieving sustainable agriculture. First, in my region, people generally rely on chemical fertilizers for planting, which increases the cost of planting and sometimes causes water pollution, such as the eutrophic oxidation of rivers due to rich phosphorus. Remarkably, proper crop rotation can replenish soil nutrients, such as planting corn and then soybean, which can reasonably maintain the balance of soil nitrogen (Rodale Institute, n.d.). Second, people are highly dependent on pesticides when planting. While pesticides can get rid of pests, they can also harm some beneficial insects. Fortunately, crop rotation is pest-resistant because rotating different plants avoids a single plant environment providing a long-term paradise for specific pests. In addition, crop rotation can also be rich in biodiversity, attracting some beneficial insects, such as pollinators (Rodale Institute, n.d.).

**3. Please outline in your own words, one other new thing you learned this week in the course. How does it apply to your life?**

One of the new things I learned this week is that by 2050 it is theoretically possible to use renewable energy sources to replace conventional energy sources, which is encouraging completely. Below are 10 suggestions for achieving a 100% renewable energy supply summarized by WFF, which are instructive.

|  |  |
| --- | --- |
| 1 | **Clean Energy**: Develop existing or new renewable energy sources |
| 2 | **Grids**: Share and exchange clean energy through gird and trade. |
| 3 | **Access**: End energy poverty by providing clean electricity and promoting sustainable practices |
| 4 | **Money**: Invest in renewable, clean energy and energy-efficient products and buildings. |
| 5 | **Food**: Stop food waste. |
| 6 | **Materials**: Reduce, reuse, and recycle. |
| 7 | **Transport**: Provide incentives to use public transportation and support research on clean energy for shipping and aviation. |
| 8 | **Technology**: Develop national, bilateral, and multilateral action plans to promote research and development in energy efficiency and renewable energy. |
| 9 | **Sustainability**: Develop and enforce strict sustainability criteria that ensure renewable energy is compatible with environmental and development goals. |
| 10 | **Agreements**: Support ambitious climate and energy agreements to provide global guidance and promote cooperation on renewable energy and efficiency efforts. |

“Ten recommendations for a 100% renewable energy future” (WWF, 2017, p. 8)

Personally, I can apply some of the above advice to my life in the following ways. First, reduce food waste, such as ordering moderate amounts of food during meals. Second, practice reducing, reusing, and recycling in daily life. Third, try to take public transportation as much as possible and choose consumer goods that only require short-distance transportation.

Word count: 610

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**6. Sustaining Environmental Quality**

**Discussion Assignment Unit 6**

**1. What is this report about**?

This report describes the impacts, risks, and potential benefits of climate change and explains how to address these impacts and risks through adaptation and mitigation (IPCC, 2014). Specifically, the report is divided into three sections. First, section A of the report introduces observed impacts, vulnerability, exposure and adaptation experience. Second, section B summarizes the future risks of climate change and the potential benefits. Third, section C further illustrates how to manage these risks through effective adaptation and mitigation to establish climate-resilient pathways (IPCC, 2014).

**2. What climate change vulnerabilities are identified for your region?**

**3. Did they surprise you? Why or why not?**

According to IPCC, Asia has three climate change vulnerabilities. First, flood damage to infrastructure, livelihoods, and settlements is increasing. Second, people's lives are increasingly threatened by heat-related events that lead to increased mortality. Third, drought-related water and food shortages cause people to suffer from malnutrition (2014). These vulnerabilities don't surprise me, as floods and drought events are becoming more frequent in my country due to climate change. For example, recently, there was a rare drought-induced forest fire in Chongqing, China (BBC, 2022). Similarly, this summer, Sichuan, China experienced a long-term drought, resulting in insufficient hydropower generation, many factories had to shut down, and even residential electricity was limited. Therefore, the damage to infrastructure, livelihoods, and settlements from the side effects of climate change is becoming more apparent, and I can feel these effects in my daily life. Hence, it's not surprising to see these vulnerabilities.

**4. Describe (in your own words) three adaptation measures that have been proposed for addressing global climate change in your region.**

**5. In your opinion, which one is the most important? Why?**

The Chinese government has adopted the following three adaptation measures to deal with global climate change. First, they have reduced coal-fired power generation for a while to reduce carbon emissions, given that thermal power accounts for a large proportion of China's energy system. Second, they vigorously develop clean and renewable energy, such as wind, solar, etc. Third, they actively promote new energy vehicles, such as electric vehicles, and provides tax subsidies. Developing new renewable energy is the most important among the above measures. The specific reasons are as follows: Although the restriction of coal-fired power generation can result in fewer carbon emissions in the short term, this is not sustainable because after the restriction of coal-fired power generation, the production of enterprises and the lives of residents have been seriously affected, and economic development has been seriously limited. The sustainable method is to develop new energy sources to gradually replace traditional energy sources, which can solve the problems of fossil energy depletion and excessive carbon emissions, thereby alleviating global warming.

**6. Outline two steps you could take to lower your climate impact. Check** [**the Union of Concerned Scientists**](https://www.ucsusa.org/climate#.VgUisyhUTnf) **for some ideas.**

I would take the following two measures. First, I will actively promote the right message about climate change. According to the Intergovernmental Panel on Climate, “misinformation on climate change and the deliberate undermining of science have contributed to misperceptions of the scientific consensus, uncertainty, disregarded risk and urgency, and dissent” (n.d., para. 1). In other words, online disinformation hinders people from forming consensus and delays their actions. Therefore, it is necessary to help disseminate knowledge related to climate change. Second, I will actively practice reducing, reusing, and recycling in my life to save energy and reduce emissions, thereby working and living sustainably.

Word count: 579

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**Written Assignment Unit 6**

Air pollution refers to gaseous and particulate pollutants in the earth's atmosphere. Common air pollutants include ground-level ozone, particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), and lead (Doršner, 2020). Air pollution seriously affects people's health. According to Stanway, in 2015, the deaths from air pollution-related diseases in China and India reached 2.2 million, accounting for half of the global air pollution deaths (2017).

Air pollutants in China are mainly particulate matter. According to the University of Chicago, China ranks 9 out of 240 for pollution, with particulate pollution of 31.6 µg/m3, more than six times the WHO guidelines (n.d.). There are three main reasons for particulate pollution in China. First, burning coal releases a lot of solid particulate matter. Specifically, China's coal-fired power plants account for 40% of the world's total (Angel, 2018), releasing a large amount of solid particulate matter yearly. Second, industrial production causes significant pollution. Specifically, China's steel, cement, and other coal-using industries emit a large amount of solid particulate matter yearly. Third, plenty of vehicle exhaust is also one of the main causes of particulate pollution. Currently, the number of cars in China has reached 302 million (Wikipedia, 2022), and car exhaust is the main cause of air pollution in some cities. Therefore, particulate pollutants from coal-fired power plants, coal-using industries such as steel and cement, and motor vehicles are China's major components of air pollution.

Although the pollutants are all particulate matter, the sources of pollution in different cities in China are distinct because of their different industrial structures and economic development levels. Specifically, in the case of Nanjing, China, where I am located, the particulate pollutants mainly come from coal burning because Nanjing is a place where energy-intensive and high-polluting industries such as steel, cement, and chemical industry are concentrated (BBC, 2015). On the contrary, the particulate pollutants in Beijing, Hangzhou, Guangzhou, and Shenzhen in China mainly come from motor vehicles because these cities have relatively few industries related to coal burning. Still, the number of motor vehicles is huge, releasing a large amount of vehicle exhaust yearly (BBC, 2015). In addition, the particulate pollutants in Tianjin, Shanghai, and Ningbo in China mainly come from dust and mobile sources such as buses, boats, trains, and industrial production (BBC, 2015). Therefore, while all are particulate matter, the sources of particle pollution in my community and elsewhere are different.

There are many skills to improve air quality in my community, and I'll choose three methods below. First, I try to avoid driving in the community because it not only emits car exhaust but also creates dust on the streets. Conversely, I try to walk or bike instead of driving. Second, support the work of community properties and actively pay taxes. At the same time, supervise their work and give them some suggestions to help improve the air in the community. For example, let them arrange for staff to clean up the garbage in the community on time, clean the road regularly, and sprinkle the road with appropriate water in dry weather to avoid dust. Third, I would call for a green roof or balcony. Specifically, planting green plants on the balcony or roof can purify the air, reduce outside noise, and insulate heat in summer. Fourth, I will actively help those who are troubled by air pollution. For example, some people's houses in the community are close to the road, and a lot of dust enters the house daily. Besides, the pollen of some plants will also enter the room in spring. A good practice is installing screens on the windows and appropriately increasing the indoor air's humidity, such as using an air humidifier, which can effectively reduce indoor air particles. Fifth, I will enthusiastically share knowledge about the harm of air pollution and ways to improve air quality to raise people's awareness of protecting the environment. I believe that if these methods are implemented, the community's air quality will be better.

In conclusion, air pollution has increasingly threatened people's health. China's particulate pollution from coal-fired, motor vehicles, steel, cement, and other industrial production is very serious, and it is necessary to take measures to alleviate it. Reducing driving, cooperating with property cleaning, promoting green roofs and balconies, helping people in need, and sharing knowledge about air pollution are effective ways to improve the community's air quality. With everyone's joint efforts, I believe people will have a clean, green, and sustainable environment.

Word count: 741

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**Learning Journal Unit 6**

**1. This link covers many of the myths about climate change. List two of the myths that you found most interesting. Outline what each myth is, and what the right answer to that question or item is.**

I found the following two myths the most interesting, and their answers are illuminating. First, one of the myths is "Climate scientists are in it for the money" (Skeptical Science, n.d., para. 1). The correct answer to this question is that what climate scientists do concerning climate change has nothing to do with money. Timmer says most climate scientists work in academic departments or government agencies, earning between $70,000 and $120,000, which is not a lot. Instead, they can make more money in other fields, such as the oil industry (Skeptical Science, n.d.). Second, the other myth is that "CO2 limits will hurt the poor" (Skeptical Science, n.d., para. 1). The right answer to this question is that the places with the fewest greenhouse gases emissions are most affected by climate change (Skeptical Science, n.d.). Specifically, the scientists compared the global map of climate vulnerability to a global map of carbon dioxide emissions. They found that highly vulnerable regions include central South America, and the Middle East, which emit less carbon dioxide. Conversely, less vulnerable regions, including the northern part of the Northern Hemisphere, release relatively more carbon dioxide (Skeptical Science, n.d.).

**2. Has your view on climate change evolved since before taking this course? Why or why not?**

By taking this course, I have a deeper understanding of climate change. First, I have a more concrete sense of the harm that climate change may bring. Specifically, the increasingly frequent global extreme climate events, such as wildfires, droughts, and floods, are more or less related to climate change. And if the trend of climate warming does not change, by 2050, 15%-37% of species will be permanently extinct (WWF, 2011), and the rising temperature will seriously damage ecosystems. As a result, the valuable ecological services they provide to humans will become unsustainable. Second, fortunately, I realized climate warming is not irreversible. People still have the opportunity to use renewable energy to completely replace traditional fuels by 2050 (WWF, 2011), thereby mitigating or reversing the trend of climate warming.

**3. Choose one the Review Questions from this week’s readings and answer it in full.**

I chose the question: “What are the major air pollution sources” (Doršner, 2020)? The answer to this question is as follows: The sources of air pollution are divided into 4 major categories, namely Stationary and Area Sources, Mobile Sources, Agricultural Sources, and Natural Sources. First, a Stationary Source is also called a point source, which refers to those sources that do not move, such as factories, power plants, etc.; Area Sources are nonpoint sources, including dry lake beds, landfills, etc. Second, Mobile Sources refer to sources that can use their power to move, including vehicles, boats, planes, and trains. Third, Agricultural Sources refer to pollution sources generated by agricultural operations, such as restricted areas where animals are raised, and the feces of animals produce ammonia gas. Fourth, Natural Sources refer to sources of pollution unrelated to human activities, such as wildland fires, dust storms, and volcanic activity, which release large amounts of gases and particulate matter into the atmosphere (Doršner, 2020).

**4. Please tell me how the course is going for you so far? Is it hard, “just right”, or easy?**

For me, this course is just right. First, the course's weekly workload is moderate, allowing me to finish this course's homework calmly while considering other courses. Second, the questions in the discussion assignments, written assignments, and learning journals are of suitable difficulty, and I can answer them after reading some materials and making some summaries. It is worth mentioning that these questions have helped me to think critically about the weekly topic and reflect deeply. Overall, the workload and difficulty of the course are just right, and I am satisfied and grateful.

Word count: 661

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**7. Soil, Pest and Water Management**

**Discussion Assignment Unit 7**

**1. Please list two bits of information, statistics or facts that you found at some of these links which interested and/or surprised you?**

The following two facts surprised me. First, “2 million tons of sewage are discharged into the world's waters every day” (UNDESA, 2014, para. 8). This huge number made me realize the seriousness of water pollution. Second, “by 2025, two-thirds of the global population could be living in water-stressed conditions, and more seriously, 1.8 billion people will be living in places with absolute water scarcity” (UN DESA, 2014, para. 6). While I know that many areas are facing water stress, the sheer number of people facing water scarcity is beyond my expectations.

**2. Explain, in your own words, what the difference is between water quality and water quantity?**

Water quality refers to some physical or chemical characteristics of water that determine whether water is suitable for a specific purpose, such as drinking, recreational or industrial production. Water quantity refers to the amount of water measured by volumes, such as cubic meters, or weight, such as kilograms.

**3. Is water quantity or quality the biggest issue in your local village/town/city? Why? Explain.**

The amount of water in my city can meet the needs of people's daily life and industrial and agricultural production. Because the city is closely adjacent to the Yangtze River, the largest river in China, which provides enough water resources for the city. However, the government can still improve the water quality. For example, the water in residents' homes comes from the water treatment plant, but the purification is incomplete, so residents cannot directly consume it. Even if it is boiled and cooled, it will have some special taste. Therefore, many households are equipped with water purifiers to purify the water further.

**4. Are there disputes, violence or wars over water in your local village/town/city?**

Because the city's water resources are relatively abundant, there is no conflict caused by competition for water resources. However, natural water plants are controlled and operated by the government, and sometimes there is a problem of illegal charging, and relevant departments need to strengthen supervision and management.

**5. Look up what IWRM is: define it.**

IWRM, namely Integrated Water Resources Management, is a process to develop, allocate and monitor water resources sustainably based on carefully considering the relationship between various water resources to maximize social, economic, and environmental benefits. This integrated management model contrasts sharply with how various sectors manage water resources independently for different purposes. It effectively avoids the incoordination of water resource development and management and the waste of water resources (CIDA, 2005).

**6. Would IWRM work to help water issues in your local village/town/city?**

IWRM has helped resolve water issues in my city. Specifically, Nanjing has a population of more than 9 million, and the daily water consumption of the residents is huge. Additionally, Nanjing has a large number of industries that require a lot of water. Furthermore, there is also some agriculture in the surrounding areas of Nanjing, which also require a lot of water for irrigation. But overall, water resources are limited. Through IWRM, the relevant departments can rationally arrange the distribution of water resources to maximize the benefits and achieve sustainable management and utilization of water resources while meeting various needs as much as possible.

Word count: 549

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**Learning Journal Unit 7**

**1. Choose one of the main water systems you have learned about that is also in your country (do you have a lake, river, coast, or coral reefs in your country?).**

**2. Research that item in our Textbook, and look online to study the environmental issues associated with it in your nation. Then list what you consider to be the two (2) main environmental problems associated with it. Please do not forget to list the references you used.**

The Yangtze River is the largest in China and is famous for its abundant water resources. But in recent years, it has faced many serious environmental problems, two of which are serious water pollution and biodiversity degradation. First, due to the discharge of industrial wastewater, some areas in the middle and lower reaches of the Yangtze River are seriously polluted. According to statistics, in 2018 alone, more than 1,300 cases of illegal discharge of hazardous waste. These illegally discharged industrial wastes have polluted the water quality in the middle and lower reaches of the Yangtze River to varying degrees, resulting in even water shortages in some areas along the river (Gao, 2019). Second, hundreds of species in the Yangtze River are at risk due to overfishing, human activities, and habitat loss (CNN, 2022). For example, IUCN updated the Red List of Threatened Species just two months ago, declaring the Chinese paddlefish and the Yangtze sturgeon extinct (Baxter, 2022). Therefore, water pollution and biodiversity shrinkage are major environmental problems in the Yangtze River Basin.

3. In what ways do these issues affect you and your family directly?

The water environment problem in the Yangtze River Basin, especially the water pollution problem, directly impacts us in the following aspects: First, water pollution leads to increased pressure on domestic water. According to Gao, Nanjing's industrial, agricultural and municipal water consumption accounts for more than 90% of the available local water resources annually (2019). In the case of water pollution, the amount of domestic water available to residents is reduced. Second, the quality of domestic water has declined. The tap water in our house comes from the local waterworks. They purify the river water and send it to residents' homes. However, this water cannot be drunk directly; even after it has been boiled and cooled, it will still have a special taste. Therefore, most residents' homes have to install water purifiers to purify the water further.

**4. In your own words, please describe one way you think those problems could perhaps be reduced or alleviated?**

An effective way to solve the above problems is for the government to strengthen the construction and implementation of corresponding rules and regulations. Specifically, China's environmental protection policies lag significantly behind economic development guidelines. Therefore, the rapid economic development in the past few decades was also accompanied by serious natural environmental problems. Regarding the problem of biodiversity degradation, relevant departments need to improve the lake recuperation system and resolutely crack down on illegal fishing to restore aquatic biodiversity effectively (NDRC, 2021). In terms of water pollution, the government needs to strengthen the governance of urban sewage and waste, chemical contamination, and agricultural non-point source pollution (NDRC, 2021). In conclusion, constructing and implementing relevant rules and regulations effectively alleviates current environmental problems.

5. Please outline in your own words, one other new thing you learned this week in the course. How does it apply to your life?

A new thing I learned this week is Integrated Water Resources Management (IWRM). Specifically, IWRM allows one to consider the relationship between various water resources and then develop, allocate and regulate water resources to meet the needs of various parties, thereby maximizing social, economic, and environmental benefits (CIDA, 2005). For example, my city uses this approach to coordinate industrial, agricultural, and domestic water use to improve water efficiency and relieve water stress. Likewise, I can use the knowledge of IWRM to manage my various water needs in an integrated manner. For example, I can use the water from the shower to flush the toilet instead of using separate water for these two purposes. In conclusion, IWRM contributes to the sustainability of water resources and is worth practicing.

Word count: 692

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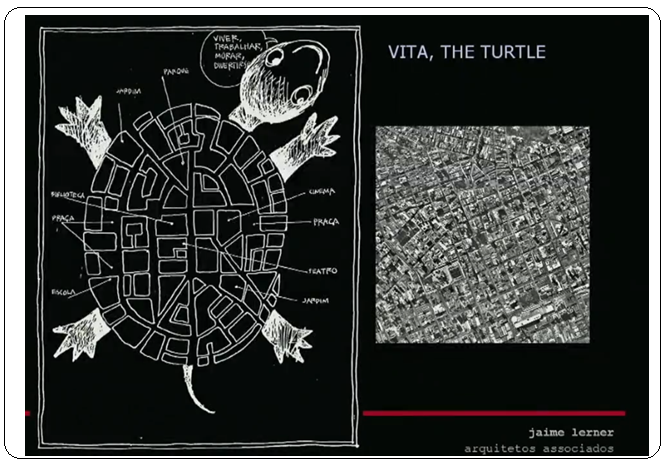
https://my.uopeople.edu/pluginfile.php/1605440/mod\_book/chapter/364704/IWRM-Plans-English.pdf

**8. Sustaining Human Societies**

**Discussion Assignment Unit 8**

**1. What is the most significant change or project in the city of Curitiba that you feel has influenced it becoming more livable, clean, or sustainable?**

Although Curitiba has a lot of significant changes, such as improving public transportation, promoting housing development, and enhancing waste management, I think the public transportation program is the most critical project. Specifically, they established the Bus Rapid Transit System (BRTS) with a radial linear-branching pattern, like a giant turtle shell style. Such a developed bus system has two significant benefits. First, cars on the bus rapid transit lines are as fast as subways, which significantly facilitates people's daily travel and trade in goods, thereby helping economic development. For example, "the per capita income loss due to severe congestion in Curitiba is 11 and 7 times lower than in Sao Paulo and Rio de Janeiro, respectively" (DESA, n.d., para. 3). Second, the construction cost of the BRTS is only one-eightieth of the subway (Mikesh, n.d.). As a result, this program has resulted in significant savings in public finances, allowing the government to spend more on other projects, such as improving housing, and managing waste. Therefore, the development of public transportation is crucial to the change in Curitiba.



Curitiba's public transport system (Lerner, 2007)

**2. What do you think the future steps in Curitiba should be? For example, what would be a good 'next project' to continue their movement forth in sustainable development and quality urban planning?**

If there is anything Curitiba can do to promote sustainable development further, it is to help boost the energy transition by using clean, renewable energy to replace traditional fossil energy gradually. Specifically, Curitiba's excellent public transportation system, high greenery coverage, outstanding waste management, and well-developed housing development make Curitiba a model for sustainable cities. However, the negative impact caused by climate warming has become increasingly prominent. The transition from traditional fossil energy to clean energy has become an urgent issue faced by many, including some developed countries. Therefore, Curitiba can continue to develop new clean and renewable energy, achieving another important milestone.

**3. Do you feel that any of the planning, projects, policy, education programs, and/or changes they have made would work well in your own city? Which one, and why? Explain.**

Curitiba has a lot of things worth studying. What impresses me most is the respect for people behind their policies, which is worth learning. For example, their garbage recycling policy and housing improvement projects deeply reflect the humanistic care behind the policy. First, the Curitiba government encourages people in slums to collect rubbish where they live, which they can exchange for food or bus tickets. This method dramatically reduces waste and improves people's living environment. Second, the government actively builds housing for people in slums and gives them low-interest loans to buy this housing, which significantly enhances people's living conditions. Third, the government helps these people in slums train new skills, making them a large part of the labour force, greatly enriching the labour market and promoting employment. The above government measures have made me genuinely feel their respect for people and the kindness in their hearts. These warm and wise policies have brought people together to turn Curitiba into a sustainable, clean and, most importantly, heart-warming city.



“we have all the problems than any big city has, but I think in this city there is a **one thing that makes a difference** is **the respect given to people**” (Lerner, 2007)

Conversely, in the city where I live, many policies lack the slightest respect for the people, and even some interest groups will use these policies to exploit and oppress the people in disguise. So when I saw Jaime Lerner in the video saying that one difference in Curitiba is respect for people, I was blown away and moved to tears. I have a dream: One day, I hope my city or country can also become a place full of humanistic care, and I will make unremitting efforts for this.

Word count: 663

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**Learning Journal Unit 8**

**1. Reflect on environmental issues you learned about in this course so far. What have been the most important decisive experiences or convincing arguments in shaping your own attitudes?**

Three convincing points made me realize the necessity and feasibility of environmental protection. First, the side effects of climate warming have strengthened my awareness of the need to protect the environment. For example, extreme climates, such as floods, droughts, and high temperatures, occur more frequently and seriously impact economic activities and people's lives. Therefore, protecting the environment is vital and imperative. Second, nature provides humans with invaluable ecological services, strengthening my feeling of environmental protection. Specifically, nature provides humans with fresh water, food, timber, fiber, fuel, and biological products (World Health Organization, 2005). However, according to WWF, if the warming trend does not change, by 2050, 15%-37% of species will be permanently extinct (2011). In this case, the ecosystem may become fragile or disintegrate, and the related ecological services may cease to exist. Therefore, it is urgent to protect the environment. Third, by 2050, humankind is expected to replace fossil fuels with clean and renewable energy, making me realize the feasibility of environmental protection. Specifically, WWF states that, despite the challenges, by 2050, it is theoretically possible to replace traditional fossil fuels with renewable energy sources completely (2011). They give a detailed theoretical basis and specific implementation suggestions, helping me rebuild my confidence in overcoming global warming.

**2. Given that, respond to this scenario: you are in charge of your own city. List three strategies to make you city more environmentally sustainable. Explain each strategy.**

I would take the following three strategies to make my city more environmentally sustainable. First, I will follow Curitiba's waste management program. Specifically, residents can get corresponding government shopping vouchers or points they can exchange for gifts after sorting their garbage into designated garbage recycling locations. This method can mobilize people's enthusiasm for garbage sorting, cultivate garbage management habits, and solve garbage disposal problems. Second, I will gradually develop clean, renewable energy sources and increase their share in the energy system. Specifically, the city where I live mainly relies on coal-fired power generation, which emits a large amount of solid particulate matter and greenhouse gases yearly, causing air pollution and climate warming. Therefore, by increasing investment in renewable energy sources and gradually replacing traditional fossil fuels, the government can alleviate air pollution problems and increase energy security. Third, the most urgent and important point is that I will lift the strict control and release the market's vitality. Specifically, the Chinese government has carried out a long-term lockdown due to the epidemic, resulting in many enterprises' closures and numerous people's unemployment. As a result, economic activities and people's lives have been seriously affected. If I were to manage the city, I would lift the lockdown, allow people to return to normal lives, and help businesses resume work and production. Because the experience of epidemic prevention and control around the world has proved that the epidemic will not pose a serious threat to life, and strict closure and control will only cause people and the country to suffer greater losses, and this behavior is unsustainable.

Word count: 527

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