

Environmental studies assignment essay example

[Environment](#), [Environmental Study](#)



Question 1: What is the difference between a positive and negative feedback loop? Describe and discuss one example of each feedback loop not discussed in the text or the course lecture.

Answer: Positive feedback loop increases the size of the state variable, whereas a negative feedback loop decreases its size (Cunningham & Cunningham, 2011). Further, positive feedback loop, if unchecked, may lead to instability of the system, while a negative feedback loop helps the system to maintain a constant state (Cunningham & Cunningham, 2011).

An example of positive feedback loop is the role of water vapor in global warming. Global warming leads to a rise in temperature of Earth's atmosphere, the state variable in this case. The rise in temperature increases the rate of evaporation from water bodies, which in turn, increases the moisture content of the air (Booth, 2013). The water vapors absorb more energy from the sun and acts as a greenhouse gas (Booth, 2013). It further increases the temperature of the atmosphere, and, amplifies the impact of global warming.

An example of negative feedback loop is the absorption of carbon dioxide by oceans due to global warming. As the global levels of carbon dioxide increase, oceans absorb more of this greenhouse gas and become more acidic. The increased acidity of oceans in turn reduces their capacity to absorb the carbon dioxide (Booth, 2013). The increase in temperature of oceans also decreases the capacity of oceans to act as carbon dioxide sinks (Booth, 2013). So the absorption of carbon dioxide by oceans is limited by increasing temperature and carbon dioxide concentration, and, results in a stable state of the oceans, the state variable in this case.

However, it would be interesting to note that both the examples lead to increased global warming, and illustrate that even the unfathomable oceans have limited capacity to act as sinks for human disturbance.

Question 2: Describe the basic steps of the scientific method. In what ways do you think this model oversimplifies how scientists work, or how you approach scientific problems in your workplace? Discuss one example of how you have solved the problem (preferable, one related to environmental science). Did you follow the steps of the scientific method? Where did you find that you had to deviate from the basic steps? If you did not have to deviate, where in the process did you come the closest to doing so? Support your answers.

Answer: There are five steps associated with the scientific method – observing, proposing a testable hypothesis, developing a test of the hypothesis and predicting the outcome, gathering data and interpreting the results (Cunningham & Cunningham, 2011).

For scientists, though the steps remain the same, the difficulties at different steps are magnified. First, the practical aspects of scale at both the spatial as well as temporal level are not always possible to achieve to observe a phenomenon, for example, for studying evolution (Cunningham & Cunningham, 2011). Second, sometimes there are limitations over testing the hypothesis, for example, in case of medicine studies (Cunningham & Cunningham, 2011). Third, the proof may be an anticipated outcome and not absolute, for example, the environmental services provided by natural systems (Cunningham & Cunningham, 2011). Fourth, the outlier effect, if the study is carried out on an outlier population, the results and interpretations

would not be reproducible (Cunningham & Cunningham, 2011). So, there is a need of testing the hypothesis at different geographical locations and on different populations. Fifth, the scientists rely on observed trends to interpret the results, therefore, peer review, and, consensus building to interpret the results and test the proposed hypothesis, are important tools in scientific studies (Cunningham & Cunningham, 2011).

I got the opportunity to solve a problem at my workplace, where I manage the recycling program. The facility produces various types of recyclable material, such as, paper and plastics, metals such as steel, aluminum, copper wire, and, wood products. Several months ago we observed that some of these materials were disappearing, especially the steel and copper wire. I brainstormed, discussed with some fellow managers and proposed a hypothesis that it happened due to a lack of proper containment. We developed a testable hypothesis and predicted that if we use a dumpster with locks, the material would not disappear. We gathered data by contacting a local company to bring in these dumpsters and provided training to the work force in the proper disposal of these materials, and then checked whether the material disappeared after this step. We interpreted the results that since after employing dumpsters, the material did not disappear, and, we were able to increase our revenue for recycled materials, our hypothesis was correct. We did not deviate from the scientific method in the process. Question 3: What is sustainability? Do you think that it is possible for a growing human population to live sustainably and still provide a standard of living that would be acceptable to most individuals? Why, or why not? Answer: Sustainability is the use of natural resources in such a way

that it ensures the progress of the present generation of humans without compromising the existence of our future generations (Cunningham & Cunningham, 2011, pp 8).

Sustainability is a greater issue when we take into account the inequitable access to resources across the nations and the income groups. The GDP varies and hence the income level of an average individual in a developed nation is 100 times than that of one in least developed nation (Cunningham & Cunningham, 2011). The residents of most developed nations have access to 100 % improved water and sanitation, these figures for least developed nations are just 61 % and 23 % respectively (Cunningham & Cunningham, 2011). The threats to sustainability are: hunger (850 million undernourished people), access to clean water (1. 1 billion people lack access to drinking water), water pollution, air quality (release of two billion metric tons of air pollutants excluding carbon dioxide and takes three million lives every year), biodiversity loss (800 species have disappeared and 10000 considered threatened), and, depleting marine resources (one billion people depend on seafood in developing countries) (Cunningham & Cunningham, 2011).

However on the other end, population is predicted to stabilize by 2050 to 8. 9 billion people from the present 7 billion. Life expectancy has doubled and the number of people facing food insecurity decreased by about 40 million since 1990s. There is awareness on renewable energy sources, such as, wind, solar, wave and tidal energy. The rate of deforestation decreased in Asia from 8 % in 1980s to 1 % in 1990s. There is greater protection of marine resources, such as Apo islands (Cunningham & Cunningham, 2011). With the advent of technology and increased education levels, creating

awareness about the environmental issues, and paying attention to our resource use, it is possible to live sustainably (Cunningham & Cunningham, 2011).

Question 4: Discuss a workplace situation in which you used some of the steps of critical thinking to solve a problem. If you do not have a workplace scenario to use, discuss how you used critical thinking to identify your position on a recent news story. Moving forward, how will you use critical thinking to assess environmental news you see in the media?

Answer: Recently I came across a news story by Environment California (2014) on the proposed limits on carbon pollution from power plants by EPA. Critically analyzing the article, I realized that, the article lacked any facts and values, and, failed to build the basis, how the action by EPA would benefit the California population, and it was difficult to conclude the article. First, the article didn't mention what were the limits being contemplated, whether they were good enough to bring any change from the earlier scenario. Second, the article mentioned about improving the health, but did not establish a relation between pollution and health of people. At another place too, the relation between pollution and global warming and rising sea levels was missing. Third, it mentioned that businesses wanted these emission cuts, which contradicts the fact that, pollutant emission limits add cost of installing pollution controlling devices, which takes a pie out of business profit. Fourth, the reporter paraphrased himself in the whole article, and did not include the response of any expert from the policy arena, industry or scientific community. Fifth the concluding paragraph was a direct attack on the energy intensive companies saying they were "dirty."

Though the role of air pollution in exacerbating global warming is well established, but here in the article it appeared that the author had just one agenda that the industry was bad for the environment. It could have been more interesting, if the article had built the relations. For example, the gases the power plants emit and their relationship with global warming, and, the impacts on natural and human systems. How the air pollution led to respiratory diseases, and, if hospitals in California have observed a rise in patients with respiratory diseases over a period? The article could use the results of surveys or scientific studies that established the impact of global warming on sea level rise, the process and the numbers. The databank and reports by Intergovernmental Panel on Climate Change (IPCC) or, Environmental Protection Agency (EPA) could have been used to give weight to the claims. Further, the article could include the response of power plants if they were happy with the news, and if not why, how are they going to achieve the proposed limits and, the stand of the Government if there would there be any penalties for the defaulters.

Environment California is a non-profit political organization that lobbies with the US State legislature for environmental issues. This article conforms to their agenda of creating awareness, but basing arguments on facts and figures would increase the credibility of the news as well as the organization. From now onwards, I would use the steps of critical thinking in the same way I did for this article.

References

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