Geography 122

Geography, Modernity, and Globalisation

Final Paper

The Modern Degradation

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Question 3: Discuss the relations between modernisation and environmental degradation, with specific reference to either air or ground pollution, or forest clearance.

1.0 Introduction

Modernity is a way of life. It is defined as an interlocking set of social, economic, political, and cultural processes and relationships associated with the European view of a modern society.[1] Ideas of modernity developed during the European Enlightenment, an intellectual movement where reason was chosen over tradition.[2] Intellectuals essentially believed that human progress could only be achieved through science, technology, secularism, separation of the church and state, and new market systems. Modernisation has since been a movement that has helped mankind progress on various fronts. Modern systems have improved health, food supply, connectivity, mobility, etc. For example, modernisation of the government involved the progression from monarchies to democracies. Modernisation of the economy involved the progression from the Keynesian interventions in the market to neo-liberal markets. Modernisation of our environment involved new mechanized farming practises, etc. to increase output. Hence, modernisation has led to the restructuring of human practises and systems and in turn created new and different patterns of consumption.[3]

While it is crucial to acknowledge the fact that modernisation has helped mankind cope with its needs, I believe that it has also created an ever-increasing demand for resources. This has

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[1] "Modernization." *Encyclopædia Britannica*. Encyclopædia Britannica, Inc., n.d. Web. 09 Mar. 2017. <https://www.britannica.com/topic/modernization>.
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[2] "Enlightenment." *Encyclopædia Britannica*. Encyclopædia Britannica, Inc., n.d. Web. 09 Mar. 2017. <https://www.britannica.com/event/Enlightenment-European-history>.
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[3] Ley, David. "Lecture 2: Modernisation, Globalisation, Human Geography." UBC. Feb. 2017. Lecture.

led to an increase in the consumption and exploitation of our natural resources, and has hence led to severe environmental degradation. This paper will explore the relationship between Modernisation and Environmental Degradation with specific reference to land degradation.

2.0 A Modern World

I believe that the relationship between modernisation and environmental degradation has two dimensions to it. First, how modern practises of governance, industrialization, etc. impact the environment, and second, how modernisation of the environment itself has led to environmental degradation. Soil Degradation is defined as the process of a soil losing its fertility, quality, and nutrients, turning it biologically dead. Soil degradation can have various indicators such as erosion, barrenness, aridness, etc.[4]

I believe that the change in our consumption patterns has majorly been due to overpopulation. Thomas Malthus believed that our population is growing at an exponential rate while the resource supply is growing just arithmetically[5]. I think that this still stands true as evidently, the supply side has not always been able to keep up with the growing demand from the ever-increasing population. Hence, this has also led to industries trying to maximize their production through various strategies (modernisation), that are mostly exploitative of the environment.

[4] Directorate, OECD Statistics. "OECD Glossary of Statistical Terms - Land Degradation Definition." *OECD Glossary of Statistical Terms - Land Degradation Definition*. N.p., n.d. Web. 09 Mar. 2017. <https://stats.oecd.org/glossary/detail.asp?ID=1494>.
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[5] Shah, Shelly. "Neo-Malthusian Theory of Population (Useful Notes)." *Sociology Discussion - Discuss Anything About Sociology*. Sociology Discussion, 09 May 2015. Web. 09 Mar. 2017. <http://www.sociologydiscussion.com/population/notes-on-neo-malthusian-theory-of-population/1119>.

Modernisation of industries has led to the adoption of high-yielding and yet exploitative practices. For example, the increase in demand for fossil fuels like coal has led to large scale strip-mining that has in turn led to land degradation.[6] Factories produce large amounts of waste and end up dumping these toxic chemical substances in landfills in order to cut costs. However, these chemicals intoxicate the land, depriving it of its nutrients, polluting underground aquifers, and lead to its long term degradation.

The development of nuclear technologies by superpowers to maintain global control and meet their energy needs also poses a huge threat to our environment. For example, after the nuclear melt-down in Chernobyl, the land around the plant was highly contaminated and to this day there remains a 30 km^2 exclusion zone.[7] Urbanization itself has led to land degradation; The concrete jungles that we created have stripped the land of its nutrients and vegetation, leading to degradation.

The increase in population to nearly 7 billion people has increased the demand for food. Modernisation of agricultural practises itself has also led to degradation. "Agro-industrialisation or industrial agriculture is the form of modern farming that refers to the industrialised production of livestock, poultry, fish and crops".[8] Agro-industrialization has played a key role in the shift from subsistence to commercial farming. It involves a high degree

[6] "About Coal Mining Impacts." *Greenpeace International*. N.p., 1 July 2016. Web. 09 Mar. 2017. <http://www.greenpeace.org/international/en/campaigns/climate-change/coal/Coal-mining-impacts/>. /.latest_citation_text

[7] McKie, Robin. "Chernobyl 25 Years On: A Poisoned Landscape." *The Observer*. Guardian News and Media, 26 Mar. 2011. Web. 10 Mar. 2017. <https://www.theguardian.com/world/2011/mar/27/chernobyl-disaster-anniversary-japan>.
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[8] Guinness, Paul. "Geography for the IB Diploma Global Interactions." *Bookdepository.com*. Cambridge University Press, 01 Apr. 2011. Web. 09 Mar. 2017. <https://www.bookdepository.com/Geography-for-IB-Diploma-Global-Interactions-Paul-Guinness/9780521147323>.

of mechanization, monoculture, intensive use of chemicals, etc. This increase in demand has led to more land being deforested, over-cultivated, overgrazed, and in turn degraded.

Agro-industrialization has been made possible due to a few modern strategies of agriculture that feature machine-intensive processes, genetically modified (GM) crops with high yield, strong fertilizers, insecticides and pesticides, better irrigation and transport systems, and larger, specialized farms. Although modernisation in this sector has helped sustain our population's needs, it has still led to the degradation of our environment. [8]

3.0 Case Studies

I will now look at practises of the current world by looking at 2 brief case studies of land degradation in China and Nepal. In China, environmental degradation can be directly attributed to modernisation. Nepal on the other hand is not considered modernized, and yet it faces large-scale environmental degradation. In the latter half, with respect to what has been analysed in the previous sections, the paper will outline and emphasize on the direct relations between Modernity and Environmental Degradation.

China is about 959,696,100 hectares in size. China's rapid economic growth can be directly attributed to the large scale environmental degradation that it has been witness to. It is a prime example of a nation that has lost a large portion of its land to degradation. It has about 6.4 % of the global arable area. Over 90% of the land allotted for grazing has degraded due to the increase in demand for livestock. According to an estimation, in 2003 the forest cover of China was 18.21% and it is currently just 14%. Hence, China loses about 5 billion tonnes of soil due to erosion each year. China's land degradation can be attributed to various factors like deforestation, over-grazing of animals, over cultivation, mismanagement of water,

urbanization, industrial pollution, and neglect.[9 and 10]

An article in Reuters showed how more than 40% of the arable land in China has been degraded. “Degraded land typically includes soil suffering from reduced fertility, erosion, changes in acidity and the effects of climate change as well as damage from pollutants. The country, which must feed nearly 1.4 billion people, has already outlined plans to tackle soil pollution, said to affect around 3.3 million hectares of land.”[11]

Nepal on the other hand is an example of a country that is facing large-scale environmental degradation in spite of low levels of modernisation. Nepal is approximately 14,718,100 hectares in size. Between 1990 and 2000, Nepal lost an average of 91,700 hectares of forested land a year, a deforestation rate of 1.90%. Overall, between 1990 and 2005, Nepal lost 24.5% of its forest cover, about 1,181,000 hectares. Industrial activity of Nepal is majorly based on the processing of agricultural produce that are usually cash crops. The agricultural sector employs over 80% of the population and accounts for 40% of GDP. Hence, it is appropriate to say that Nepal has boosted its GDP at the expense of its environmental health. In spite of the

[9] Berry, Leonard. "China." *Land Degradation Assessment in Drylands*. LADA, n.d. Web. 10 Mar. 2017. <http://www.fao.org/nr/lada/index.php?option=com_docman&task=doc...gid...>. /.latest_citation_text

[10] "Desertification and Land Degradation in China." *Desertification and Land Degradation in China*. GeoCases UK, n.d. Web. 10 Mar. 2017. <http://www.geocases1.co.uk/printable/Desertification%20and%20land%20degredation%20in%20China.htm>. /.latest_citation_text

[11] Patton, Dominique. "More than 40 Percent of China's Arable Land Degraded: Xinhua." *Reuters*. Thomson Reuters, 04 Nov. 2014. Web. 10 Mar. 2017. <http://www.reuters.com/article/us-china-soil-idUSKBN0IO0Y720141104>. /.latest_citation_text

decrease in the rate of deforestation in recent times, the excessive deforestation has periodically led to famine, landslides, and drought.[12 and 13]

4.1 Anthropogenic Causes of Soil Degradation

The various exploitative practises by us humans can be attributed to the large-scale land degradation that the world is now witness to. For example, overgrazing occurs when livestock is allowed to graze on a piece of land till the point where the land is left barren and vulnerable to erosion. Over-cultivation is when agricultural land is farmed on continuously for multiple seasons without letting the soil regenerate its nutrients, leading to its degradation. The use of GM crops requires high amounts of chemical fertilizers and pesticides. This intoxicates the soil and reduces its life, eventually leading to its degradation. Over-usage of water in an area can lead to degradation as well. For example, severe depletion of the water in a lake can lead to the whole region becoming arid, and in turn increasing soil erosion and hence degradation. [14 and 15]

[12] "Nepal." *Forest Data: Nepal Deforestation Rates and Related Forestry Figures*. Mongabay, 2006. Web. 10 Mar. 2017. <http://rainforests.mongabay.com/deforestation/archive/Nepal.htm>.
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[13] Stewart, Janet. "The Impact of Deforestation on Life in Nepal." *Cultural Survival*. N.p., Sept. 1986. Web. 10 Mar. 2017. <https://www.culturalsurvival.org/publications/cultural-survival-quarterly/impact-deforestation-life-nepal>.
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[14] H, Eswaran. "Natural Resources Conservation Service." *Land Degradation: An Overview | NRCS Soils*. Natural Resources Conservation Service Soils, n.d. Web. 10 Mar. 2017. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/?cid=nrcs142p2_054028>.
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[15] "Discuss Factors That Contribute to Soil Erosion and Discuss Ways That Soil Erosion Control Can Be Integrated into Forage Product." *Forage Information System*. Oregon State University, 06 Jan. 2016. Web. 10 Mar. 2017. <http://forages.oregonstate.edu/nfgc/eo/onlineforagecurriculum/instructormaterials/availabletopics/environmentalissues/erosion>.
/.latest_citation_text

Industrial pollution is another huge contributor to land degradation. Toxic chemicals, metals, etc. are usually dumped into landfills and this leads to the intoxication of the soil, leaving it degraded and unfit for future use. Chemical and biological warfare pose huge, chronic threats to our environment as well. For example, Agent Orange, an herbicidal warfare programme by the Unites States that was used to defoliate forests in Vietnam in the 1960's intoxicated the land so much that it still remains degraded to this day. [16]

Overpopulation has increased the demand for resources and hence, the pressure on industries to match supply levels with the demand. It has also increased the demand for space and led to severe deforestation. Deforestation leads to the loss of soil stability, increasing the risk of soil erosion and land sliding. Trees are also a huge source of nutrients to the soil and their absence can deplete the quality of soil.

4.2 Natural Causes of Soil Degradation

Some aspects of land degradation can also be attributed to natural factors. Although, they might indirectly be exemplified by human activity, their occurrence is still natural. At times, the weather and climate of a region itself leads to the degradation of soil. For example, in deserts, the soil is naturally arid and hence the soil is degraded/desertified. Global warming has led to change in the patterns of plant growth, water supply of regions, etc. This has in turn led to the loss of vegetative cover in many regions, increasing soil erosion and hence, land degradation. Intensifying rainfall and floods lead to the oversaturation of soil increasing runoff that erodes soil rapidly. Strong winds are also capable of large-scale surface erosion.

[16] "Agent Orange." *Wikipedia*. Wikimedia Foundation, 10 Mar. 2017. Web. 10 Mar. 2017. <https://en.wikipedia.org/wiki/Agent_Orange>.
/.latest_citation_text

4.3 Further Implications of Soil Degradation

The environmental impacts do not end at just soil degradation, there are further implications. For instance, the topsoil contains humus, a layer that is rich in nutrients. Erosion impacts the topsoil most and hence leads to a huge loss of nutrients. Desertification occurs when the soil is completely stripped of its nutrients, and becomes infertile, turning into a desert. Once a desert, dust storms can occur when strong winds lead to intense erosion of soils that are degraded. As the soil degrades, it cannot be cultivated and this would in turn reduce crop yields by increasing stress on the other supplies of land, and possibly lead to famine. The pollution of soils and natural water bodies can also lead to acid rain, further intoxicating more regions and increasing degradation.[17]

5.0 The Future

As evident, environmental degradation is now a growing problem with huge implications. People are now starting to become aware of the fact that we have exceed the carrying capacity of our earth. Many NGO's, Governments, Environmentalists, and other interest groups have started promoting various conservation strategies to tackle the issue. Crop rotation is a farming method that involves changing the kind of crop grown on a piece of land every season in order to keep the soil healthy. Fallow periods are also crucial as they allow the soil regenerate its nutrients by allowing it to rest.[18]

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[17] "Soil Erosion and Degradation." *WWF*. World Wildlife Fund, n.d. Web. 10 Mar. 2017. <http://www.worldwildlife.org/threats/soil-erosion-and-degradation>. /.latest_citation_text

[18] " Conservation Strategies." *Greenfieldgeography*. IB Geography, 2011. Web. 10 Mar. 2017. <http://greenfieldgeography.wikispaces.com/conservation+strategies>. /.latest_citation_text

Erosion can be prevented by ploughing land with respect to its shape. This helps direct water flow naturally and reduces erosion by water. E.g. Terracing and Contour ploughing. Natural barriers such as trees around a farmland also help reduce the erosion around it as the vegetation increases soil stability. [19]

Interventionist actions by governments or interest group by making/calling for strict laws and their enforcement can make a huge difference in protecting our environment and regulating waste disposal. For example, limiting how much animals are allowed to graze, how many seasons a land can be used for, the quantity of chemicals that can be used on a farmland, etc. by implementing quota systems will help reduce land degradation. [20]

By controlling urbanization, we can ensure that land is kept forested in equal proportions to the built up areas. Land reclamation is the process of reclaiming land, usually from the water in order to increase the amount of healthy land available to farm on. This way, we could probably expand into the sea and help save forests. Although, if we are able to control our population, then we can directly reduce the stress on our environment, as the balance will make our practises comparatively sustainable. Ignorance is one of the biggest issues with regard to any problem at hand. It is important to educate people about the implications of overpopulation, environmental degradation, modernisation, etc. [21]

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[19] " Soil and Change." *Greenfieldgeography*. IB Geography, 2011. Web. 10 Mar. 2017. <http://greenfieldgeography.wikispaces.com/Soil+and+change>. /.latest_citation_text

[20] "Conservation Strategies." *Greenfieldgeography*. IB Geography, 2011. Web. 10 Mar. 2017. <http://greenfieldgeography.wikispaces.com/conservation+strategies>. /.latest_citation_text

[21] "Degradation through Raw Material Production." *Greenfieldgeography*. IB Geography, 2011. Web. 10 Mar. 2017. <http://greenfieldgeography.wikispaces.com/Degradation+through+raw+material+production>. /.latest_citation_text

6.0 Conclusion

If modernisation was solely looked at as an aid to human progression, then it has definitely improved lives to a great extent. For example, in India, modernisation of villages by the building of better infrastructure, increased connectivity, open markets, improved healthcare, etc. has undoubtedly improved millions of lives.

Perhaps colonialism and capitalism are to blame for environmental degradation. Maybe the previous, pre-modern model of subsistence worked best with high efficiency and minimal impact on the environment. After all, colonization led to the classic international division of labour where colonial countries specialised in manufacturing and colonies in the production of primary goods. This majorly led to the modernisation of framing practises in the colonies, by forcing the shift from subsistence to commercial farming.

Although, at this stage, it is nearly impossible to go back to our old practises. We do not have any alternatives that can meet the demands of our current world as modernisation has. We need to find more efficient and sustainable ways to meet current demands with minimal damage. Robert Waller says, "In farming, efficiency has become a catchword. It has become a business now; it is not a way of life anymore."[22] This shows how our goal has become to maximize output and meet our own needs irrespective of the impact we have on our environment. Hence, modernisation has been heavily dependent on our environment to progress. I believe that it is crucial for us humans to become aware of our wrongdoings and for us to adopt a non-human

[22] Robert Waller, chapter 3, *Britain's Farm Policy*, p.47.

centric outlook of the world in order to develop an environmental consciousness and make our planet more sustainable.

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22) Robert Waller, chapter 3, *Britain's Farm Policy*, p.47.

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