

Impacts of climate change on Biodiversity and ecosystem

1 Introduction:

2 Key drivers of climate change that affect biodiversity and ecosystem:

3 Multifaceted and Interconnected impacts of climate change on biodiversity and ecosystem:

3(a) Changes in temperature affect the range and abundance of species.

3(b) Shift in temperature affect the timing of seasonal events such as migration and breeding.

3(c) Decreased precipitation leads to reduce plant growth and increased mortality.

3(d) Sea-level rise cause the loss of coastal habitat and biodiversity.

3(e) Increased acidity in ocean affect the survival and growth of marine species.

3(f) Excessive precipitation cause floods that disrupts ecosystem functioning.

3(g) Increased frequency and frequency of extreme weather events affect ecosystem processes and species interaction.

4 Potential solutions to address the impact of climate change on biodiversity and ecosystem

4a) Incorporate climate change projection into conservation planning to protect and restore habitat.

4b) Implement adaptive management strategies to respond to changes in Phenology.

4c) Invest in sustainable water management to reduce impacts of changing precipitation pattern.

4d) Reduce carbon emission to slow the rate of ocean acidification.

5 Conclusion

The Essay

Climate change is not only about rising temperature and CO_2 level, changing precipitation pattern but also turning fertile land into wasteland. It is also changing abundance into scarcity. For instance, in 2022, Pakistan has faced worst flooding because of unprecedented monsoon rain that intensify by climate change. This catastrophic event has wiped out wheat, rice, and cotton. It also disrupt global food supply chain and cause food insecurity. As the floods submerged one-third of country, destroyed over 4 million acres of crops, and displaced 33 million people. This demonstrates that climate change has become the biggest threat to global food insecurity. There are some research-based evidence which prove the aforementioned issue. As agriculture yield has been reduced because of changing rainfall pattern and increasing water scarcity. Similarly, extreme weather events and heat waves reduce productivity of agricultural land and live stock.

Rising CO_2 level and global warming also impact on nutritional content of crop and livelihood. Additionally, freshwater resources are contaminated by increasing sea level that threaten food availability. However, some effective strategies can be helpful to mitigate climate-related food insecurity. Drought tolerant crop varieties and climate change infrastructure can increase resilience against catastrophic events. Moreover, sustainable fisheries and aquaculture practices should be promoting to maintain fish population. Soil fertility and agriculture productivity can be increased by implementing sustainable soil management practices. In the nutshell, climate change has become the biggest threat to food security across the globe. However, some pragmatic measures can be helpful to lessen climate-related food insecurity.

The changing rainfall patterns have profound impact on soil quality, which in turn effect soil fertility, consequently, reduce agriculture yield. As erratic rainfall cause leaching of

nutrients, eroding of soil and decreasing moisture ~~of~~ in soil. These factors effect the soil quality and fertility in long run. Similarly, in the region, where irregular rainfall patterns occur limit the nutrients uptake and compact the soil. Ultimately agriculture yield ~~has~~ become reduce because of low soil quality. These arguments well illustrated by Financial Times report "Climate graphic of the week" which highlight the impact of changing rainfall pattern due to climate change on UK and France wheat crops. Food prices and agriculture yield has been disrupt across the globe. These factors cause food insecurity in vulnerable region. In addition to this, excessive rainfall can lead to waterlogging, depleting oxygen in soil and causing root rot. As soil fertility decline, agriculture crops reduce. Therefore, changing rainfall patterns due to climate change, disrupt soil quality, effect soil fertility and cause food insecurity.

Like rainfall patten, water scarcity is also become a pressing

issue because of prolonged drought, which effect agriculture yield. Consistent irrigation is necessary for crop germination, yield and growth. But reduced rainfall pattern disrupt the water cycle and water resources. This cause shortage of water that severely impacts agriculture, especially in region reliant on rain-fed system. Moreover, drought also force over exploitation of ground water resource which in turn increased salinization and reduced fertility. For instance, California, one of the largest agriculture producer in United state, has faced recurrent droughts exacerbated by climate change. Over the past two decade, water availability has decreased, in the result, food availability also reduced. This case study highlights how drought driven by climate change effect food security. Moreover, water scarcity also creates uncertainty because of its severe impacts on agriculture yield. Hence, water scarcity occurred by prolonged drought due to climat change cause food insecurity in whole world.

To conclude, research have proved that climate change has become the biggest threat to global food security. But, by adopting some effective strategies, it can be possible to reduce this threat.

Food security across the globe is threaten by climate change in the way ^{that} it reduces fertility of agricultural land. Moreover, climate change cause extreme weather events which damage soil structure adversely. Heat waves is also increasing because of climate change, harm livestock. In addition, rising CO₂ level to global warming is also have negative impacts on crops, fish production and other food resources.

Similarly, sea level rise is also reduced the availability of food by impacting agriculture and water resources. However, it can be possible to diminish the threat of food security ~~cause~~ occur because of climate change. Drought tolerant crop varieties should be promoted. Moreover, climate resilient infrastructure and

sustainable fisheries can protect ~~crop~~
from adverse weather events. Furthermore,
soil management practices ought
to be implemented to increase soil fertility
and productivity. As Ban Ki-moon rightly
said, "food security is climate security.
Without a sustainable environment, there
can be no sustainable food system."