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A conceptual study on impact of air pollution on migration of birds and insects

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Abstract
It's a normal feature that millions of birds migrate towards tropical countries like India, during winter seasons for various reasons, and they return back to their native habitats when temperature rises at desired levels. There are documents that birds fly through specific migratory paths, as monitored by learned ornithologists. In the context of growing number of high-rise building constructions in metropolis and the tendency of raising stag heights to reduce the impacts of air pollutants by the industries. Can ornithologists comment on the height / distance from the ground or msl of different regions of the migratory paths of the birds.

Keywords: Ecology, Pollution, Climate

1. Introduction

Weather and climate are important physical environmental factors which influences the ecosystems. The term Ecosystem deals with the biotic (living) and abiotic (nonliving) components within the environment along with the factors interacting each other. An ecosystem can be as large as an ocean or as small as a local pond.

Ecosystems provide people with food, goods, medicines, and many other products. They also play a vital role in nutrient cycling, water purification, and climate moderation. All weather and climatic parameters affect the ecosystem elements in various ways. In turn, biotic elements influence the development of microclimate in an ecosystem.

Human activities also affect weather and climate which now has come to reality leading us to the perceived global climate change. Weather and Climate have profound effects on ecosystems and the habitats that support life on earth. The variation of temperature, humidity and precipitation the quality of water, soil forming process directly will influence the floral growth and faunal composition. Even though smaller changes are taking place in weather conditions a fairly high impact may be observed on natural resources.

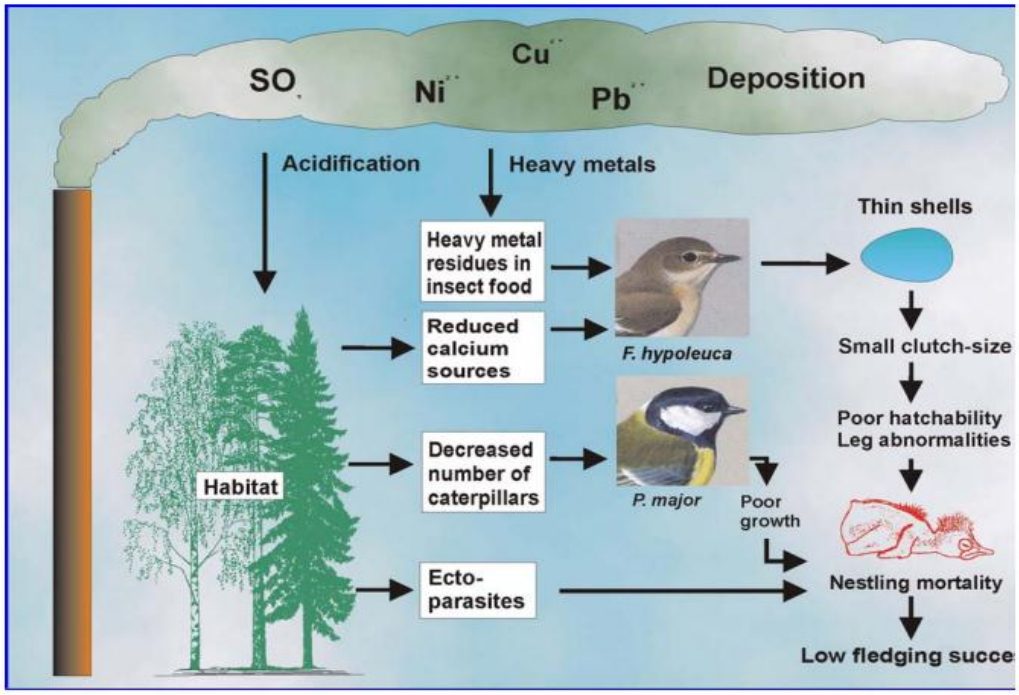
Changes are expected to alter the makeup and functioning of ecosystems, as well as some of the critical benefits that ecosystems provide to people. Fast changes in the climate can threaten ecosystems that have already been weakened by other human activities such as pollution, development, and overharvest etc. Biodiversity is the living component of any ecosystem.

Although species have adapted to environmental change for millions of years, a quickly changing climate could require adaptation on larger and faster scales than in the past. Those species that cannot adapt are at risk of extinction. Even the loss of a single species can have cascading effects because organisms are connected through food webs and other interactions. The timing of many natural events, such as flower blooms and animal migrations, is linked to climate factors such as temperature, moisture availability, and amount of daylight.

Changes in weather patterns and extreme events associated with climate change can disrupt these natural patterns. These disruptions, in turn, can affect seasonal behavior and interactions among species. For example, if birds migrate and lay eggs too early, hatchlings might not have an adequate food supply. While some animals and plants will successfully adjust life-cycle patterns to changing weather pattern cues, others might not be so successful.

Climate change can alter where species live and how they interact, which could fundamentally transform current ecosystems. Impacts on one species can ripple through the food web and affect many organisms in an ecosystem. India's weather and climatic conditions are naturally controlled by its geographical locations and hence the parameters of weather vary from place to place. Due to such variations the vegetation type, soil quality and water quality also vary from place to place.

Weather and Climate variability have various significant parameters such as Rain, Temperature, Wind and Humidity that inflict impact on the abiotic and biotic nature on earth. These parameters have effect on the occurrence, abundance, seasonality and behavior of living organisms as well as quality of air, water and soil. It has direct or indirect effect on the various ecosystems. When some of these ecosystems are available everywhere in India some will be restricted to very specialized locations.



2. Research Study

Weather and climate variability affect the phenology of plants, occurrence of various floral and faunal elements populations of different species and in the manifestation of many behavior of animals. The consequences of climate variability disasters also such as floods, droughts, unprecedented rains, inconsistencies in seasonal temperature etc on various ecosystems. We need to understand and observe the changes biotic and abiotic parameters weather/climate on ecosystems.

For example in pond ecosystem the intensity of rain will change the level of water, change the pH level, turbidity and so on which in turn influence the activities such as growth of grass, flowering, behave in different ways. Weather and climate variability affect the phenology of plants, occurrence of various floral and faunal elements populations of different species and in the manifestation of many behavior of species. The consequences of climate variability at a macro level could be manifested as floods, droughts, unprecedented rains, inconsistencies in seasonal temperature etc on various ecosystems.

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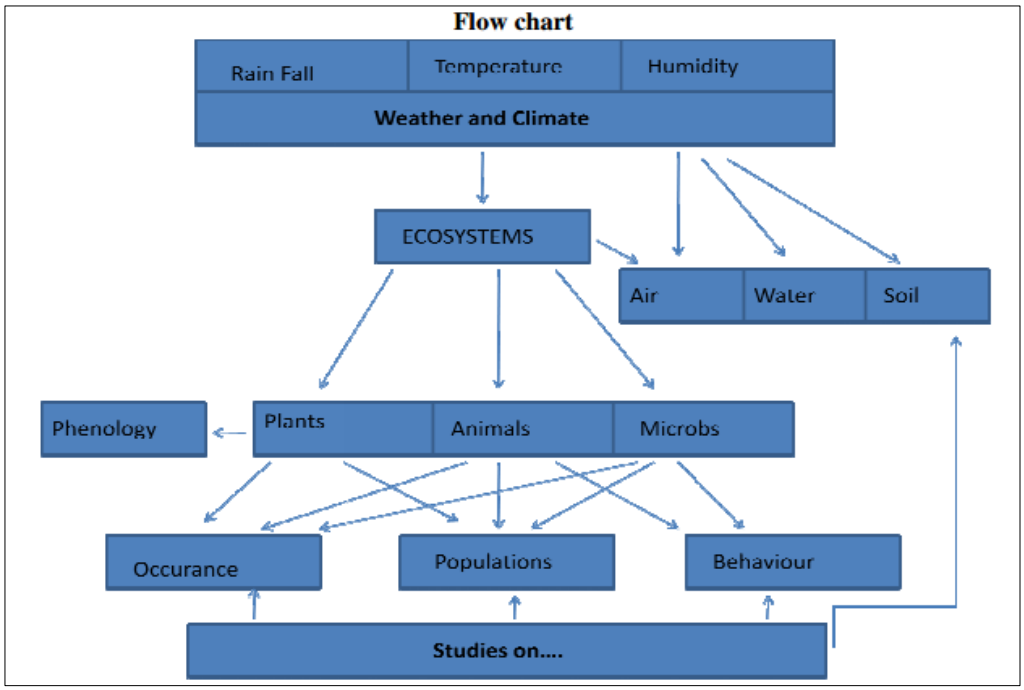

Systematic observations, measurement and analysis make you understand the functioning of ecosystem in better way. To understand the effect of Weather and climate variability affect the phenology of plants, occurrence of various floral and faunal elements populations of different species and in the manifestation of many behavior could be manifested as floods, droughts, unprecedented rains, inconsistencies in seasonal in weather parameters as well as the changes in around us.

This will enable us to study the effect of the climate. For example in pond ecosystem the intensity of rain will change the pH level, turbidity and so on which in turn influence the biological birds. Measurement and analysis make us effect of weather and climate on the life on the surrounding or vice versa the children's projects should begin with asking significant questions to that effect.

The physical processes that cause climate change are scientifically well documented: both human activities and natural variability are contributing to global and regional warming. According to the Intergovernmental Panel on Climate Change, whose documents are considered the most authoritative source for information on the "state of the science" on climate change, it is very likely that most of the observed warming over the past 50 years is the result of increased greenhouse gases generated by human activities.

3. Significance of the Study

Numerous expert reports from the National Research Council have supported this conclusion as well. The release of greenhouse gases has increased significantly since the Industrial Revolution, mostly from the burning of fossil fuels for energy, agriculture, industrial processes, and transportation. Carbon dioxide, a major greenhouse gas, is increasing in the atmosphere faster than at any time measured in the past, having grown by about 35 percent since 1850.

Two other greenhouse gases, methane and nitrous oxide, are present in the atmosphere at much lower concentrations than carbon dioxide but have increased rapidly. Methane has increased by 150 percent; in addition, it is 25 times more effective per molecule at trapping heat than carbon dioxide. Nitrous oxide, nearly 300 times more effective, has increased by more than 20 percent.

Living things are intimately connected to their physical surroundings. Even small changes in the temperature of the air, the moisture in the soil, or the salinity of the water can have significant effects. Each species is affected by such changes individually, but those individual impacts can quickly reverberate through the intricate web of life that makes up an ecosystem.

In particular, two important types of ecological impacts of climate change have been observed across the United States: shifts in species' ranges (the locations in which they can survive and reproduce), and shifts in phenology (the timing of biological activities that take place seasonally). Examples of these types of impacts have been observed in many species, in many regions, and over long periods of time.

4. Conclusion

Climate change is also driving changes in the timing of seasonal biological activities. Many biological events, especially those in the spring and fall, are based on seasonal cues. Studies have found that the seasonal behaviors of many species now happen 15–20 days earlier than several decades ago. Migrant birds are arriving earlier, butterflies are emerging sooner, and plants are budding and blooming earlier.

If all of the species in an ecosystem shifted their seasonal behavior in exactly the same way, these shifts might not create problems. But when a species depends upon another for survival and only one changes its timing, these shifts can disrupt important ecological interactions, such as that between predators and their prey. For example, a small black-and-white bird called the European pied flycatcher has not changed the time it arrives on its breeding grounds even though the caterpillars it feeds its young are emerging earlier. Missing the peak of food availability means fewer chicks are surviving, in turn causing the flycatcher's population to decline.

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