



Simplified Biogeography

SIMPLIFIED

BIOGEOGRAPHY

GEOGRAPHY OPTIONAL SPECIAL

A COMPREHENSIVE WORK

FOR UPSC CSE

AND OTHER COMPETITIVE EXAMINATIONS

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The Geocologist

ABOUT THE AUTHOR

Dr. Krishnanand is highly proficient scholar in the field of research and academics in Geography and environment. He graduated from Shaheed Bhagat Singh College, University of Delhi. He was awarded “**best student of the college across all disciplines**” in 2009 and “**Gold medal**” in 2010. He completed his Ph.D from Department of Geography, Delhi School of Economics, University of Delhi. **He has a teaching experience of over a decade in the field of Geography for UPSC, State PCS , UGC NET and other competitive examinations.**

He is an avid field researcher and photographer with two Geographical Documentaries on YouTube Channel- TheGeoecologist, to his credit - **Exploring Ladakh- A Geoecological Perspective and Spiti Valley Project.** His areas of interest include Geomorphology, Geoecology, Geotourism, Environmental Geography, Geodiversity, Geomorphosites, Fossil park, Geoparks, Field Work and Documentary Making in Geography, Remote Sensing and Geographic Information System (GIS) and GPS. **He has published three books and six articles at National and International levels.**

This E-book by Dr. Krishnanand is a Simplified Compilation on BIOGEOGRAPHY along with detailed explanations available through his YouTube lectures of the same.



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Biogeography is the study of the distribution of species and ecosystems in geographic space and through geological time. Organisms and biological communities often vary in a regular fashion along geographic gradients of latitude, elevation, isolation and habitat area. Phytogeography is the branch of biogeography that studies the distribution of plants. Zoogeography is the branch that studies distribution of animals. Mycogeography is the branch that studies distribution of fungi, such as mushrooms.

Biogeography is an integrative field of inquiry that unites concepts and information from ecology, evolutionary biology, taxonomy, geology, physical geography, paleontology, and climatology. Modern biogeographic research combines information and ideas from many fields, from the physiological and ecological constraints on organismal dispersal to geological and climatological phenomena operating at global spatial scales and evolutionary time frames. The short-term interactions within a habitat and species of organisms describe the ecological application of biogeography. Historical biogeography describes the long-term, evolutionary periods of time for broader classifications of organisms.

This E-book aims to facilitate the young and budding **UPSC CSE aspirants** as well as geographers and research scholars especially in the field of geographical studies to understand the conceptual framework of the subject matter of Biogeography in a comprehensive manner.

Dr. Krishnanand

CHAPTER 1

INTRODUCTION TO

BIOGEOGRAPHY

Biogeography is the study of the distribution of species and ecosystems in geographic space and through geological time. Organisms and biological communities often vary in a regular fashion along geographic gradients of latitude, elevation, isolation and habitat area.

Phytogeography is the branch of biogeography that studies the distribution of plants. **Zoogeography** is the branch that studies distribution of animals. **Mycogeography** is the branch that studies distribution of fungi, such as mushrooms.

Knowledge of spatial variation in the numbers and types of organisms is as vital to us today as it was to our early human ancestors, as we adapt to heterogeneous but geographically predictable environments. **Biogeography is an integrative field of inquiry that unites concepts and information from ecology, evolutionary biology, taxonomy, geology, physical geography, paleontology, and climatology.**

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Early scientists, beginning with **Carl Linnaeus**, contributed to the development of biogeography as a science.

The scientific theory of biogeography grows out of the work of **Alexander von Humboldt** (1769–1859), **Francisco Jose de Caldas** (1768-1816), **Hewett Cottrell Watson** (1804–1881), **Alphonse de Candolle** (1806–1893), **Alfred Russel Wallace** (1823–1913), **Philip Lutley Sclater** (1829–1913) and other biologists and explorers.

The patterns of species distribution across geographical areas can usually be explained through a combination of historical factors such as: **speciation, extinction, continental drift, and glaciation**. Through observing the geographic distribution of species, we can see associated variations in sea level, river routes, habitat, and river capture. Additionally, this science considers the geographic constraints of landmass areas and isolation, as well as the available ecosystem energy supplies.

Over periods of ecological changes, biogeography includes the study of plant and animal species in: their past and/or present living refugium habitat; their interim living sites; and/or their survival locales.

As writer **David Quammen** put it, "*...biogeography does more than ask Which species? and Where. It also asks Why? and, what is sometimes more crucial, Why not?.*"

Modern biogeography often employs the use of **Geographic Information Systems (GIS)**, to understand the factors affecting organism distribution, and to predict future trends in organism distribution. Often mathematical models and GIS are employed to solve ecological problems that have a spatial aspect to them.

Biogeography is most keenly observed on the **world's islands**. These habitats are often much more manageable areas of study because they are more condensed than larger ecosystems on the mainland. **Islands are very diverse in their biomes**, ranging from the tropical to arctic climates. This diversity in habitat allows for a wide range of species study in different parts of the world.

One scientist who recognized the importance of these geographic locations was Charles Darwin, who remarked in his journal "**The Zoology of Archipelagoes will be well worth examination**". Two chapters in *On the Origin of Species* were devoted to geographical distribution.