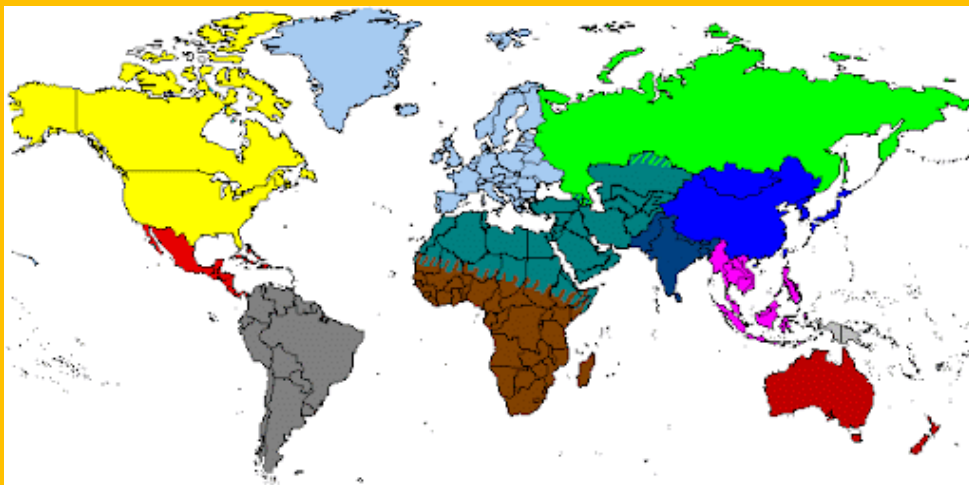


GEOG-509



WORLD REGIONAL GEOGRAPHY



**DEPARTMENT OF GEOGRAPHY AND NATURAL RESOURCE
MANAGEMENT**

**SCHOOL OF EARTH AND ENVIRONMENTAL SCIENCE
UTTARAKHAND OPEN UNIVERSITY**

(Teenpani Bypass, Behind Transport Nagar Haldwani (Nainital) Uttarakhand)

M.A /M.Sc GEOG - 509

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AND NATURAL RESOURCE MANAGEMENT
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BLOCK-1 CONCEPTUAL BASES

UNIT-1 REGIONAL GEOGRAPHY, CONCEPT, APPROACHES, METHODS & SIGNIFICANCE

1.1 OBJECTIVES

1.2 INTRODUCTION

1.3 CONCEPTS OF REGIONAL GEOGRAPHY

1.4 APPROACHES OF REGIONAL GEOGRAPHY

1.5 METHODS OF REGIONAL GEOGRAPHY

1.6 SIGNIFICANCE OF REGIONAL GEOGRAPHY

1.7 SUMMARY

1.8 GLOSSARY

1.9 ANSWER TO CHECK YOUR PROGRESS

1.10 REFERENCES

1.11 TERMINAL QUESTIONS

1.1 OBJECTIVES

After reading this unit, you will be able to:

- Understanding the concepts of regional geography.
- Learn about approaches to regional geography.
- Gain knowledge about methods of regional geography.
- Learn about the significance of regional geography.

1.2 INTRODUCTION

Regional geography, as a subfield of the broader discipline, offers a nuanced understanding of specific geographic areas by scrutinizing the interplay between physical, cultural, economic, and social elements within defined boundaries. Rooted in ancient traditions of geographical description, the discipline gained momentum during the Age of Exploration, when explorers and cartographers began to map and characterize newly discovered territories. The 18th and 19th centuries witnessed a shift towards systematic observations, with Alexander von Humboldt's holistic approach acting as a precursor to regional geography's development. Throughout the 20th century, regional geography underwent transformative phases, from the quantitative revolution to the rise of regional science and the post-World War II emphasis on area studies. The field incorporates a wide range of perspectives, including cultural, economic, and political, to unravel the distinctiveness of regions. As it has adapted to changing intellectual paradigms and societal needs, regional geography continues to be a dynamic discipline, addressing contemporary challenges in a globalized world. Today, its interdisciplinary nature enables a comprehensive exploration of regions, offering valuable insights into their complexities and significance within the broader geographical context.

The history of regional geography is a dynamic narrative that reflects the evolution of the broader discipline of geography. In ancient Greece, scholars like Strabo laid early foundations by describing and categorizing regions in their geographical context. The Age of Exploration in the 15th to 17th centuries contributed significantly as explorers and cartographers provided detailed maps and descriptions of newly discovered territories. However, it was during the Enlightenment in the 18th and 19th centuries that the discipline witnessed a shift towards systematic observations and categorizations. Alexander von Humboldt's interdisciplinary approach, particularly in his work "Kosmos," played a pivotal role in integrating physical and human geography, providing a precursor to the development of regional geography.

In the mid-20th century, the quantitative revolution marked a turning point, emphasizing mathematical and statistical methods in geography. Concurrently, the field of regional science emerged, focusing on spatial analysis and modelling. The post-World War II era saw a rise in regionalism and area studies, with geographers delving into the intricacies of specific regions,

incorporating cultural, economic, and political perspectives. The 1960s and 1970s introduced structuralism and Marxist geography, with scholars like David Harvey examining socio-economic structures influencing regional development. The late 20th century witnessed a cultural turn in geography, emphasizing humanistic approaches that focused on the subjective experiences and cultural meanings associated with regions.

Postmodern and critical geography in the late 20th century challenged traditional approaches, emphasizing the fluid and contested nature of regions. In the 21st century, regional geography has evolved into an interdisciplinary field, integrating insights from environmental science, political science, and economics to address contemporary challenges such as globalization, climate change, and social justice. Today, regional geography continues to adapt and remain relevant, contributing valuable perspectives to the understanding of diverse regions and their complexities in an ever-changing world.

Alexander von Humboldt (1769–1859):

Humboldt, a German geographer and naturalist, emphasized the interconnectedness of physical and human phenomena. His work laid the groundwork for regional geography by integrating diverse aspects of geography. He viewed regions as dynamic entities shaped by complex interactions between natural and cultural elements.

Paul Vidal de la Blache (1845–1918):

Vidal de la Blache, a French geographer and one of the founders of modern geography, emphasized the importance of the "genre de vie" or way of life in defining regions. According to him, regions are not just physical entities but are characterized by the distinctive cultural practices and lifestyles of their inhabitants.

Carl O. Sauer (1889–1975):

Sauer, an American geographer, contributed significantly to cultural geography. He emphasized the cultural landscape and how human activities leave imprints on the environment. For Sauer, regions were not just natural entities but cultural landscapes shaped by human activities over time.

Jean Gottmann (1915–1994):

Gottmann, a French geographer, made significant contributions to the study of urban geography and regional development. He defined regions as functional entities, emphasizing the

role of transportation and communication networks in connecting different areas and fostering regional integration.

Peter Haggett (born 1933):

Haggett, a British geographer, is known for his work in quantitative geography and spatial analysis. He views regions as spatial units characterized by certain homogeneities in terms of physical, economic, or social attributes. His work has contributed to the understanding of spatial patterns and regional differentiation.

Doreen Massey (1944–2016):

Massey, a British social geographer, contributed to feminist geography and critical regionalism. She challenged fixed and static notions of regions, advocating for a more dynamic understanding. According to Massey, regions are not bounded entities but are continually shaped by social relations and interactions.

Characteristics of Regions

Physical Characteristics:

Physical characteristics of regions encompass the natural features and environmental attributes that distinguish one geographic area from another. These characteristics play a crucial role in shaping the landscape, climate, and ecosystems of a region. Here are the key physical characteristics of regions:

Climate:

Regions exhibit distinct climate patterns, such as tropical, arid, temperate, or polar climates. Climate influences temperature, precipitation, and weather conditions, affecting vegetation and human activities.

Topography:

The topography of a region includes landforms such as mountains, hills, valleys, plains, plateaus, and coastal features. Topography influences drainage patterns, soil types, and the suitability of land for various purposes.

Geology:

The geological composition of a region, including types of rocks and soils, contributes to its physical characteristics. Geological features like mountains, plains, and geological formations are essential components.

Soil Types:

Different regions have varying soil compositions based on factors like climate, parent material, and vegetation. Soil types influence agriculture, land use, and ecosystem dynamics.

Vegetation:

The types of vegetation, including forests, grasslands, deserts, and wetlands, contribute to the physical character of a region. Vegetation is influenced by climate, soil, and ecological processes.

Hydrology:

Hydrological features, such as rivers, lakes, and oceans, shape the water systems of a region. River networks, water availability, and drainage patterns impact both natural ecosystems and human settlements.

Cultural Characteristics:

The cultural characteristics of regions are diverse and multifaceted, encompassing a wide range of elements that define the unique identity and social fabric of a particular geographic area. Here is a detailed exploration of cultural characteristics:

Language and Dialects:

The linguistic diversity within a region involves the languages spoken by the population, including any regional dialects. Language is a key component of cultural identity and communication.

Religious Practices:

The dominant religions, belief systems, and religious practices shape the cultural norms and values of a region. Religious institutions, rituals, and celebrations contribute to the cultural landscape.

Festivals and Celebrations:

Specific festivals and celebrations held in a region provide insights into cultural traditions, historical events, and communal bonds. These events often involve music, dance, food, and rituals.

Cuisine and Culinary Traditions:

The local cuisine and culinary traditions reflect the region's geography, climate, and historical influences. Food preparation methods, ingredients, and traditional dishes contribute to cultural identity.

Traditional Arts and Crafts:

Artistic expressions, including traditional arts, crafts, and craftsmanship, showcase the creativity and cultural heritage of a region. These may include painting, sculpture, pottery, and textile arts.

Economic Activities:

Economic activities within regions are diverse and multifaceted, encompassing a spectrum of sectors that collectively contribute to the development and prosperity of a geographic area. In the agricultural domain, regions engage in crop cultivation, livestock farming, and agribusiness, influencing food production and rural economies. The industrial sector, including manufacturing industries, produces a wide array of goods, from textiles to machinery, playing a pivotal role in driving economic growth. The services sector, comprising retail and wholesale trade, hospitality, and financial services, is integral to the functioning of regional economies, providing essential commercial and financial activities.

Natural resource extraction, encompassing mining, forestry, and fishing, contributes significantly to regions endowed with abundant natural resources. Energy production, whether through renewable sources like wind and solar or non-renewable sources like oil and gas, is a crucial economic activity. Transportation and logistics infrastructure, including roads, railways, and ports, facilitates the movement of goods, supporting regional trade and commerce. Real

estate and construction activities, involving property development and infrastructure projects, stimulate economic growth and urban development.

Political Characteristics:

Political characteristics of regions encompass the governance structures, political dynamics, and administrative features that define the political landscape of a specific geographic area. These characteristics are influenced by historical, cultural, and geopolitical factors. Here are the key political characteristics of regions:

Political Boundaries:

Regions are often demarcated by political boundaries, including national borders, state or provincial lines, and administrative districts. These boundaries define the jurisdiction of political entities within a region.

Administrative Divisions:

Within regions, there are often administrative divisions such as states, provinces, counties, or municipalities. These divisions facilitate the organization and delivery of public services.

Environmental Characteristics:

Environmental characteristics of regions encompass the natural features, ecosystems, and climatic conditions that define the physical environment of a specific geographic area. These characteristics play a crucial role in shaping the biodiversity, ecological processes, and overall environmental quality of a region. Here are key environmental characteristics:

Ecosystems:

Different regions host diverse ecosystems, including forests, grasslands, deserts, wetlands, and marine environments. The type of ecosystem contributes to the biodiversity and ecological dynamics of the region.

Biodiversity:

The variety of plant and animal species within a region constitutes its biodiversity. Regions with high biodiversity may support a wide range of species, contributing to ecosystem health and resilience.

Water Bodies:

The presence of rivers, lakes, ponds, and oceans contributes to the hydrological characteristics of a region. Water bodies support aquatic ecosystems and influence local climates.

Natural Resources:

Regions are characterized by the availability of natural resources such as minerals, fossil fuels, and renewable resources like timber and freshwater. Resource distribution impacts economic activities and development.

1.3 CONCEPTS OF REGIONAL GEOGRAPHY

The concept of regions in geography involves the division of the Earth's surface into areas with distinct characteristics based on certain criteria. There are various types of regions, each serving different purposes in geographical analysis. Here are some key concepts of regions, along with references for further exploration:

Natural Region

A natural region refers to a geographic area characterized by a specific combination of physical features, climate, vegetation, and landforms that distinguish it from surrounding areas. The concept of natural regions recognizes the inherent unity and coherence of the natural environment within a given geographical space. The boundaries of natural regions are often defined by natural features such as rivers, mountain ranges, or climatic zones, and they transcend political or administrative divisions. For example, a desert natural region may be identified by its arid climate, sparse vegetation, and distinctive landforms. The study of natural regions is fundamental to physical geography, as it helps geographers understand the interactions between various components of the Earth's surface and the ecological processes that shape landscapes. Natural regions provide a framework for ecological research, conservation efforts, and the sustainable management of natural resources. By identifying and classifying natural regions, geographers gain insights into the diversity and complexity of the Earth's physical environment and the dynamic relationships between natural elements.

Formal Regions:

Formal regions, also known as uniform or homogeneous regions, represent geographic areas characterized by a distinct set of uniform attributes or features. These regions exhibit a level of homogeneity in terms of physical, cultural, or economic characteristics, setting them

apart from their surrounding areas. One defining feature of formal regions is the clear and well-defined boundaries that distinguish them from adjacent territories. These boundaries are often established based on objective and measurable criteria, making the identification of the region straightforward. Examples of formal regions include political entities like countries, states, or cities, each with specific administrative borders and governance structures. Economic regions, such as those defined by shared economic policies or similar industrial activities, also exemplify the concept of formal regions. The homogeneity within formal regions allows for systematic analysis, providing a framework for understanding and comparing areas with consistent attributes. This concept is foundational in geographic studies, contributing to a nuanced understanding of the diverse and structured nature of the Earth's surface.

Functional regions, a concept in geography, are defined by the presence of a central point and the outward flow of interactions, activities, or influence from that focal point. Unlike formal regions, the boundaries of functional regions are not rigidly defined but are rather based on the spatial extent of the functional connections radiating from a core. These connections often revolve around specific activities, services, or economic functions that create a network within the region. For example, a city and its surrounding suburbs form a functional region where the central city serves as a focal point for economic activities, employment, and services that extend into the surrounding areas. Transportation networks, communication systems, and trade routes often contribute to the functionality of these regions. The concept of functional regions emphasizes the interdependence and connectivity of places based on the flow of goods, services, or information. It is particularly valuable for understanding the dynamics of urban and economic systems, illustrating how certain areas serve as hubs influencing the surrounding spaces in a networked fashion.

Perceptual Regions:

Perceptual regions, also known as vernacular or popular regions, are conceptualized based on the subjective perceptions and feelings of people rather than precise geographical or administrative boundaries. These regions are defined by the collective beliefs, attitudes, and cultural understandings of individuals within a given area. The boundaries of perceptual regions are fluid and may vary among individuals or groups based on their experiences, cultural backgrounds, and interpretations. People often identify with perceptual regions through a shared sense of place, common stereotypes, or cultural affiliations. These regions can be rooted in historical, linguistic, or even imaginary connections that individuals perceive as meaningful. For instance, the American Midwest or the notion of the "Deep South" in the United States represents perceptual regions shaped by cultural, historical, and social connotations rather than strict geographical boundaries. Perceptual regions highlight the importance of subjective human

experiences in shaping our understanding of space, contributing to a more nuanced and culturally informed perspective in the field of geography.

Functional Regions:

Functional regions, a concept in geography, are defined by the presence of a central point and the outward flow of interactions, activities, or influence from that focal point. Unlike formal regions, the boundaries of functional regions are not rigidly defined but are rather based on the spatial extent of the functional connections radiating from a core. These connections often revolve around specific activities, services, or economic functions that create a network within the region. For example, a city and its surrounding suburbs form a functional region where the central city serves as a focal point for economic activities, employment, and services that extend into the surrounding areas. Transportation networks, communication systems, and trade routes often contribute to the functionality of these regions. The concept of functional regions emphasizes the interdependence and connectivity of places based on the flow of goods, services, or information. It is particularly valuable for understanding the dynamics of urban and economic systems, illustrating how certain areas serve as hubs influencing the surrounding spaces in a networked fashion.

Cultural Regions:

Cultural regions are geographic areas characterized by a shared set of cultural traits, practices, and beliefs that distinguish them from other areas. These regions are defined by the cultural identity and commonalities of the people who inhabit them. Cultural traits within these regions often include language, religion, customs, traditions, art, and cuisine. The boundaries of cultural regions are dynamic and may overlap, reflecting the fluid nature of cultural exchanges and interactions. The concept of cultural regions acknowledges the intricate relationships between people and their environment, emphasizing how cultural practices are influenced by geography. For example, the Arab world, with its shared language (Arabic), religion (Islam), and cultural traditions, constitutes a cultural region with a distinct identity. Cultural regions play a crucial role in shaping human interactions, societal norms, and the preservation of cultural heritage. They serve as frameworks for understanding the diversity of human societies and how cultural elements contribute to the richness of different geographic areas.

Spatial Regions:

Spatial regions refer to specific areas on the Earth's surface characterized by certain spatial patterns, arrangements, or relationships. These regions are defined by the distribution of physical and human features, creating distinct patterns across the landscape. The concept of spatial regions recognizes that the arrangement of phenomena, whether natural or human-made,

is not random but follows discernible spatial structures. Examples include mountainous regions, coastal areas, and urban centres, each exhibiting unique spatial characteristics. Spatial regions are crucial for understanding the relationships between different elements of the environment and how they contribute to the overall geography of a place. This concept underscores the significance of space and location in geography, highlighting how the arrangement of features influences ecological, social, and economic dynamics within a given region. As geographers analyze spatial regions, they uncover patterns that contribute to a deeper understanding of the interconnectedness and organization of various elements across the Earth's surface.

Ecological Regions:

Ecological regions are geographic areas characterized by distinct ecosystems, biodiversity, and environmental conditions. These regions are defined by the unique combination of climate, topography, and vegetation that shapes the natural environment. The concept of ecological regions emphasizes the interconnectedness of living organisms with their surroundings, highlighting the delicate balance that sustains diverse ecosystems. For instance, a tropical rainforest represents an ecological region characterized by high temperatures, abundant rainfall, and a rich diversity of plant and animal species. Ecological regions play a crucial role in conservation efforts, as they help identify areas with specific environmental features and unique habitats. Understanding ecological regions is essential for preserving biodiversity, managing natural resources sustainably, and addressing environmental challenges. The delineation of these regions aids ecologists, conservationists, and policymakers in developing targeted strategies for habitat protection, restoration, and the overall stewardship of Earth's diverse ecosystems.

Economic Regions:

Economic regions are geographical areas that share common economic characteristics, often defined by similar patterns of economic activities, industrial specialization, and economic development. These regions are shaped by factors such as trade, production, and the distribution of goods and services, contributing to their economic identity. Economic regions can be delineated based on criteria such as GDP per capita, industrial sectors, employment patterns, or specific economic policies. For example, a technology hub with a concentration of software development and high-tech industries may be identified as an economic region. The concept of economic regions is vital for understanding the spatial organization of economic activities, regional disparities in development, and the impact of economic processes on local communities. Policymakers and planners use insights from economic regions to formulate strategies for fostering economic growth, addressing challenges, and promoting sustainable development within specific geographic areas. The study of economic regions contributes to a comprehensive understanding of the intricate connections between geography, economics, and regional development.

1.4 APPROACHES OF REGIONAL GEOGRAPHY

Landscape morphology

Landscape morphology is a significant approach within regional geography that focuses on the physical characteristics and spatial patterns of the Earth's surface. This approach delves into the study of landforms, their spatial distribution, and the processes that shape them over time. Landscape morphology examines the topography, geological features, and land cover within a region to understand the unique configuration and appearance of the landscape. It considers how natural forces, such as erosion, tectonic activity, and weathering, contribute to the formation of diverse landforms like mountains, valleys, plains, and coastal features. Additionally, human activities, such as urbanization and land use changes, are integral components of landscape morphology studies, as they influence the transformation of the natural environment. By analyzing the morphology of landscapes, regional geographers gain insights into the physical characteristics that define a region, shaping its identity and influencing various aspects of human life, settlement patterns, and economic activities. This approach is crucial for understanding the dynamic interaction between natural processes and human activities that collectively contribute to the distinctive geography of specific regions.

Landscape Ecology

Landscape ecology represents an approach within regional geography that focuses on the spatial arrangement and interaction of different ecosystems and land cover types within a particular geographic area. This approach emphasizes the study of patterns, processes, and ecological dynamics occurring at the landscape scale. Landscape ecology is concerned with understanding how human activities and natural forces shape the structure and function of landscapes, influencing biodiversity, habitat connectivity, and ecological processes. It explores the spatial distribution of features such as forests, wetlands, urban areas, and agricultural lands, recognizing the interconnectedness of these elements. By employing principles from ecology, geography, and environmental science, landscape ecologists analyze the impacts of land use changes, fragmentation, and habitat loss on ecosystems. This approach is crucial for informing sustainable land management practices, conservation strategies, and policies that aim to balance human needs with ecological integrity. Through the lens of landscape ecology, regional geographers gain insights into the complex relationships between human societies and the natural environment, fostering a holistic understanding of the spatial dynamics that shape the landscapes of specific regions.

Landscape chronology

Landscape chronology is a fundamental approach in regional geography that involves the systematic study of the temporal evolution of landscapes within a specific geographic area. This approach aims to unravel the historical sequence of events and processes that have shaped the physical, cultural, and environmental aspects of a region over time. By employing various dating methods, historical documents, and archaeological evidence, landscape chronology helps construct a timeline of significant events such as geological changes, climatic fluctuations, human settlement patterns, and land-use transformations. This temporal perspective allows regional geographers to trace the developmental trajectories of landscapes, understanding how past influences have contributed to the current spatial configuration. Landscape chronology is crucial for comprehending the historical contingencies that have shaped the unique character of regions, contributing to a holistic understanding of the complex interplay between human societies and their dynamic environments. Through this approach, regional geographers gain insights into the temporal dimensions of landscapes, fostering a deeper appreciation of the historical context that underlies the geographical features of a given region.

Regionalization

Regionalization is a fundamental approach in regional geography that involves the systematic division and categorization of the Earth's surface into distinct regions based on various criteria. This process aims to identify and analyze patterns of similarity and difference in physical, cultural, economic, or environmental characteristics across geographic areas. Regionalization recognizes that the world is not homogenous and that understanding these variations is crucial for effective geographical analysis. Regional geographers employ different methodologies, including statistical techniques, qualitative assessments, and expert judgment, to delineate boundaries and define regions. The resulting regional classifications can vary based on the goals of the analysis, ranging from administrative divisions and economic zones to cultural or ecological regions. Regionalization provides a framework for organizing spatial information, enabling researchers to study specific areas in more detail and make meaningful comparisons between regions. This approach is essential for addressing questions related to regional development, resource management, and the spatial distribution of human activities, contributing to a more nuanced understanding of the complex interactions between people and their environments across different parts of the world.

1.5 METHODS OF REGIONAL GEOGRAPHY

The study of regional geography employs a range of methods to analyze the spatial patterns, interactions, and characteristics of specific geographic areas. Some key methods include:

Field Surveys and Observation:

Field surveys and observation represent a fundamental method in the study of regional geography, involving direct on-site data collection within a specific geographic area. Researchers conduct field surveys to systematically observe, document, and analyze the physical, cultural, and environmental features of a region. This method relies on firsthand experiences and direct interaction with the local context, allowing geographers to gather information that might not be apparent through secondary sources. Field surveys often include activities such as mapping landforms, documenting land use patterns, observing human settlement structures, and recording local flora and fauna. These observations provide valuable insights into the spatial dynamics, variations, and nuances of a region, contributing to a holistic understanding of its unique characteristics. Field surveys and observation are indispensable tools for regional geographers seeking to uncover the intricacies of a particular area, offering a firsthand perspective that enhances the accuracy and depth of their analyses.

GIS (Geographic Information Systems) & Remote Sensing:

Geographic Information Systems (GIS) and Remote Sensing collectively form a powerful and complementary methodological duo in the study of regional geography. GIS integrates and analyzes diverse spatial datasets, while Remote Sensing captures information about the Earth's surface through satellite or aerial imagery. Together, they enable researchers to acquire, manage, and interpret a wealth of geographical information, providing a comprehensive understanding of regional dynamics. GIS allows for the creation of detailed maps that showcase spatial patterns, relationships, and variations within a region. Meanwhile, Remote Sensing provides valuable data on land cover, vegetation, urbanization, and environmental changes, offering a broader perspective. By combining these methods, regional geographers can conduct sophisticated analyses, such as land-use assessments, environmental monitoring, and change detection. The synergy between GIS and Remote Sensing enhances the precision and efficiency of regional studies, facilitating informed decision-making in areas such as resource management, land-use planning, and environmental conservation. Together, these methods contribute significantly to the exploration and interpretation of the complex spatial relationships that characterize regional geography.

Spatial Analysis:

Spatial analysis serves as a crucial method in the study of regional geography, focusing on the examination and interpretation of spatial patterns, relationships, and variations within specific geographic areas. This method involves the systematic investigation of how different

geographic phenomena are distributed across space and how they interact with one another. Spatial analysis employs a range of techniques, including statistical analyses, mapping, and modeling, to uncover insights into the structure and dynamics of regions. Through this method, regional geographers can identify clusters, trends, and spatial associations in diverse datasets, enabling a nuanced understanding of the complexities inherent in regional landscapes. Spatial analysis aids in the identification of spatial disparities, the assessment of spatial changes over time, and the recognition of factors influencing regional development. Whether examining demographic distributions, land use patterns, or environmental changes, spatial analysis provides a valuable lens through which regional geographers can unravel the intricate spatial relationships that define and shape the unique characteristics of geographic regions.

Qualitative Methods:

Qualitative methods constitute a vital approach in the study of regional geography, offering a nuanced and in-depth exploration of the subjective and experiential aspects of a geographic area. These methods, which may include interviews, focus groups, participant observation, and content analysis, aim to uncover the social, cultural, and economic dimensions that quantitative data alone may not capture. Through qualitative research, regional geographers gain insights into the lived experiences, perspectives, and behaviours of the local population, contributing to a richer understanding of the region's dynamics. By engaging with individuals and communities, qualitative methods provide context to statistical data and allow researchers to explore the complexities of human-environment interactions. This approach is particularly valuable when studying topics such as community identity, cultural landscapes, and perceptions of place. Qualitative methods in regional geography offer a human-centred perspective, facilitating a more comprehensive and empathetic understanding of the multifaceted relationships between people and their geographical surroundings within a region.

Comparative Analysis:

Comparative analysis stands as a fundamental method in the study of regional geography, enabling researchers to systematically evaluate and contrast different geographic areas to identify similarities, differences, and underlying patterns. This method involves the examination of multiple regions, considering various factors such as physical geography, socio-economic indicators, cultural characteristics, and environmental dynamics. By conducting detailed comparisons, regional geographers can discern the unique attributes that distinguish one region from another and uncover the factors contributing to these distinctions. Comparative analysis is instrumental in exploring regional variations in development, land use, and human-environment interactions. It allows researchers to draw connections between disparate regions, learn from best practices, and understand the impact of diverse geographical contexts on local

dynamics. This method fosters a broader understanding of the spatial and temporal dimensions of regional geography, providing valuable insights that contribute to informed decision-making in areas such as regional planning, policy development, and sustainable development.

Cartography:

Cartography, the science and art of mapmaking, is a foundational and integral method in the study of regional geography. It involves the creation, interpretation, and analysis of maps to represent and communicate spatial information about a specific geographic area. Cartography serves as a powerful tool for regional geographers, enabling them to visually communicate complex spatial patterns, relationships, and variations within a region. Maps created through cartographic methods not only offer a means of presenting data but also facilitate the exploration and interpretation of geographical phenomena. Through the use of symbols, colours, and spatial representations, cartography allows researchers to convey information about landforms, infrastructure, demographics, and other regional characteristics. Additionally, interactive and digital mapping technologies have enhanced the capabilities of cartography in the field of regional geography, providing dynamic tools for spatial analysis. By employing cartography, regional geographers can visually explore, communicate, and share insights into the diverse and dynamic spatial features that define a particular region.

Case Studies:

Case studies serve as a valuable and insightful method in the study of regional geography, involving an in-depth and comprehensive analysis of a specific geographic area. In regional geography, case studies focus on understanding the unique characteristics, complexities, and dynamics of a particular region by examining it in detail. Researchers employing this method typically collect and analyze a diverse range of data, including physical geography features, cultural aspects, economic structures, and historical development. By delving deeply into the specifics of a case, regional geographers can uncover the intricate interactions between human activities and the environment, as well as the social, economic, and political factors shaping the region. Case studies allow for a contextualized understanding of regional complexities, offering insights that may not be apparent through broader, quantitative approaches. Through the exploration of specific instances, regional geography case studies contribute to a richer and more nuanced comprehension of the geographical patterns and processes that define and differentiate one region from another.

1.6 SIGNIFICANCE OF REGIONAL GEOGRAPHY

The study of regional geography holds significant importance for several reasons, offering valuable insights into the spatial characteristics, interactions, and dynamics of specific

geographic areas. Here are some key aspects highlighting the significance of studying regional geography:

Spatial Understanding:

Spatial understanding is a fundamental significance of regional geography, as it provides a comprehensive framework for examining and interpreting the spatial patterns, interactions, and variations within specific geographic areas. Regional geography facilitates the exploration of how physical, cultural, economic, and environmental elements manifest across different regions, contributing to a nuanced understanding of the world's diverse landscapes. This spatial perspective enables researchers and policymakers to grasp the unique identity and characteristics that define each region. By comprehending spatial relationships, regional geographers can analyze how human activities shape the environment and, reciprocally, how the physical landscape influences societal structures. Spatial understanding is crucial for regional planning, resource management, and sustainable development, as it informs decision-making regarding land use, infrastructure development, and the allocation of resources. Furthermore, this spatial insight contributes to cross-disciplinary applications, such as environmental conservation, urban planning, and disaster management, emphasizing the pivotal role of regional geography in fostering a deeper awareness of the intricate spatial dynamics that shape our world.

Regional Planning and Development:

Regional planning and development stand out as significant outcomes of the study of regional geography. Through the insights provided by regional geography, planners and policymakers can make informed decisions aimed at shaping the sustainable growth and development of specific geographic areas. By understanding the spatial patterns, natural resources, and cultural dynamics unique to each region, regional geography plays a crucial role in the formulation of effective planning strategies. This includes decisions related to land use, infrastructure development, and resource allocation. Regional planning, guided by the knowledge derived from regional geography, aims to create environments that foster economic prosperity, social well-being, and environmental sustainability. The discipline helps identify regions with specific strengths and challenges, guiding the allocation of resources and investments to address disparities. Overall, the significance of regional planning and development in the context of regional geography lies in its ability to translate academic insights into practical solutions, shaping the future trajectory of regions for the benefit of their inhabitants and the broader society.

Environmental Management:

Environmental management emerges as a crucial significance of regional geography, emphasizing the discipline's pivotal role in understanding and addressing the complex interactions between human activities and the natural environment within specific geographic areas. Through the lens of regional geography, researchers gain insights into the distribution of ecosystems, biodiversity, and the impact of human-induced changes on local landscapes. This knowledge is instrumental in formulating effective environmental management strategies that balance the needs of human populations with the preservation of ecosystems. Regional geography contributes to the identification of areas prone to environmental degradation, the assessment of habitat loss, and the understanding of the implications of climate change at the regional level. By recognizing the distinct environmental challenges faced by different regions, environmental managers can tailor conservation and sustainability initiatives to address the specific needs and vulnerabilities of each area. In essence, the significance of regional geography in environmental management lies in its ability to inform policies and practices that promote the responsible stewardship of natural resources, contributing to the long-term health and resilience of ecosystems within a regional context.

Human Settlement Patterns:

Highlighting the discipline's importance in unravelling the complexities of how populations distribute themselves across different geographic areas. Regional geography provides a lens through which researchers can examine the spatial organization of human activities, understanding the factors influencing the establishment and growth of settlements. By delving into aspects such as historical development, economic opportunities, and environmental conditions, regional geography offers insights into the evolution of settlement patterns. This knowledge is invaluable for urban planners, policymakers, and researchers as it informs decisions related to infrastructure development, housing, and resource allocation. Additionally, regional geography sheds light on the social and cultural dynamics shaping the character of settlements, contributing to a deeper understanding of the diverse ways in which communities interact with their environments. Ultimately, the significance of human settlement patterns in regional geography lies in their ability to inform sustainable urban and rural development strategies that enhance the quality of life for diverse populations within specific geographic regions.

Tourism Planning:

Tourism planning stands out as a significant outcome of the study of regional geography, underscoring the discipline's role in shaping strategies for the sustainable development of tourist destinations. Regional geography provides crucial insights into the diverse natural, cultural, and historical attributes that characterize specific geographic areas, forming the foundation for

effective tourism planning. By understanding the unique features of regions, including landscapes, ecosystems, and cultural heritage, planners can develop strategies to capitalize on these attractions while minimizing negative impacts on the environment and local communities. Regional geography aids in the identification of potential tourism hubs, the development of infrastructure to support visitor needs, and the formulation of policies to preserve the authenticity and integrity of destinations. The significance of tourism planning in regional geography lies in its ability to foster responsible and sustainable tourism, contributing to the economic development of regions while safeguarding their cultural and environmental assets for future generations. This intersection between regional geography and tourism planning exemplifies the discipline's practical applications in shaping positive and resilient regional development.

1.7 SUMMARY

Regional geography is a multifaceted discipline that investigates the spatial patterns, interactions, and characteristics of specific geographic areas, emphasizing the importance of understanding the uniqueness and complexities inherent to different regions. At its core, regional geography provides a comprehensive framework for analyzing the diverse physical, cultural, economic, and environmental features that shape the identity of specific geographic spaces. Through the integration of various research methods such as field surveys, GIS, and remote sensing, regional geographers gain insights into the spatial variations and relationships within regions. This field offers a holistic perspective, emphasizing the interconnectedness between human societies and their environments. It is instrumental in regional planning and development, guiding policymakers in making informed decisions about land use, resource allocation, and infrastructure development to promote sustainable growth. Regional geography also contributes significantly to cultural preservation by studying how local customs, traditions, and social structures contribute to the distinctiveness of a region. Furthermore, the discipline plays a pivotal role in environmental management, helping identify regions prone to natural hazards and informing conservation efforts. Human settlement patterns and tourism planning are other key areas where regional geography provides valuable insights, guiding planners in creating environments that foster economic prosperity while safeguarding cultural and natural heritage.

The significance of regional geography extends beyond academic realms, influencing policymaking, environmental stewardship, and sustainable development practices. By fostering spatial understanding, the discipline contributes to cross-cultural appreciation and cooperation, recognizing the diversity of regions as integral components of the global landscape. In essence, regional geography serves as a bridge between theory and practice, enriching our comprehension of the intricate spatial dynamics that shape the world while offering practical applications for addressing contemporary challenges and promoting responsible regional development.

1.8 GLOSSARY

- **Spatial Variation:** Refers to the differences and variations in physical, cultural, economic, or environmental features across different geographic areas or regions.
- **Land Use Planning:** The systematic process of allocating and managing land for specific purposes, such as residential, commercial, agricultural, or conservation, to achieve sustainable development goals within a region.
- **Cultural Landscape:** The visible outcome of human activities on the natural environment, encompassing structures, landforms, and other features that reflect the cultural identity of a region.
- **Geographic Information Systems (GIS):** A technology that integrates spatial data, such as maps and satellite imagery, to analyze and interpret geographic patterns, relationships, and trends.
- **Human-Environment Interaction:** The reciprocal relationship between human societies and their surrounding environments, exploring how people adapt to, modify, and depend on the natural world.
- **Regional Planning:** The process of formulating policies and strategies for the sustainable development of specific geographic regions, considering economic, social, and environmental factors.
- **Environmental Management:** The application of policies and practices to responsibly use, protect, and conserve natural resources and ecosystems within a specific region.
- **Urbanization:** The process of increasing population concentration in urban areas, often accompanied by the growth and expansion of cities, influencing the social and economic dynamics of a region.
- **Spatial Analysis:** The examination of spatial patterns, relationships, and variations within a region using techniques such as mapping, statistical analysis, and modelling.
- **Cultural Ecology:** The study of the relationship between human culture and the environment, exploring how cultural practices and beliefs influence and are influenced by the natural surroundings within a region.

1.9 ANSWER TO CHECK YOUR PROGRESS

Question 1: What is the primary focus of regional geography?

- A) Global phenomena
- B) Local phenomena
- C) National phenomena
- D) Continental phenomena

Answer: B)

Question 2: Which method involves the integration of spatial data to analyze and visualize geographic patterns?

- A) Remote Sensing
- B) Cartography
- C) GIS (Geographic Information Systems)
- D) Spatial Analysis

Answer: C)

Question 3: What does the term "cultural landscape" in regional geography refer to?

- A) The physical features of a region
- B) Human-made structures within a region
- C) The combination of human and natural elements that shape a region
- D) The economic activities of a region

Answer: C)

Question 4: What is the systematic division and categorization of the Earth's surface into distinct regions called?

- A) Geopolitics
- B) Regionalization
- C) Cultural Ecology
- D) Remote Sensing

Answer: B)

Question 5: Which method involves studying historical documents, records, and maps to understand the historical development of a region?

- A) Field Surveys
- B) Archival Research
- C) Qualitative Methods
- D) Spatial Analysis

Answer: B)

Question 6: What does the term "spatial variation" refer to in regional geography?

- A) Differences in time zones
- B) Variations in the distribution of features across space
- C) Changes in climate over time
- D) Population growth over time

Answer: B)

Question 7: What is the primary purpose of regional planning?

- A) To study global economic trends
- B) To promote sustainable development within a specific region
- C) To analyze cultural practices worldwide
- D) To create national policies

Answer: B)

Question 8: What does the term "Human-Environment Interaction" focus on in regional geography?

- A) Economic development
- B) The reciprocal relationship between humans and their environment
- C) Political boundaries
- D) Historical events

Answer: B)

Question 9: Which method involves firsthand observations and data collection in the field?

- A) GIS
- B) Remote Sensing
- C) Field Surveys
- D) Cartography

Answer: C)

Question 10: What is the process of allocating and managing land for specific purposes, such as residential or commercial use?

- A) Spatial Analysis
- B) Regionalization
- C) Land Use Planning
- D) Cultural Landscape

Answer: C)

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1.11 TERMINAL QUESTIONS

Question 1: How does the concept of "spatial variation" contribute to our understanding of the unique characteristics of different regions?

Question 2: Explain the role of regional geography in addressing environmental challenges and promoting conservation efforts.

Question 3: How can regional planning help mitigate disparities and promote equitable development within and between regions?

Question 4: Discuss the significance of cultural landscapes in regional geography and how they contribute to the identity of a region.

Question 5: How might human settlement patterns be influenced by cultural, economic, and environmental factors within a region?

Question 6: Reflect on the future challenges and opportunities in the field of regional Geography.

UNIT 2- MAJOR WORLD REGIONS & BLOCK ON VERIOUS DELIMITATION BASES

2.1 OBJECTIVES

2.2 INTRODUCTION

2.3 BASIS OF DEMARCATION OF NATURAL REGIONS

2.3.1 EQUATORIAL REGION

2.3.2 SAVANNA REGION OR SUDAN TYPE REGION

2.3.3. HOT DESERT OR SAHARA TYPE REGION

3.3.4 TROPICAL MONSOON REGION

2.3.5. MEDITERRANEAN REGION

2.3.6 CHINESE TYPE REGION

2.3.7 TEMPERATE DESERT REGION

2.3.8 WESTERN EUROPE TYPE REGION

2.3.9 PRAIRIE-TYPE REGION

2.3.10 ST. LAWRENCE-TYPE REGION

2.3.11 TAIGA-TYPE REGION

2.3.12 TUNDRA-TYPE REGION

2.3.13 HIGH MOUNTAIN REGION

2.4 SUMMARY

2.5 GLOSSARY

2.6 ANSWER TO CHECK YOUR PROGRESS

2.7 REFERENCES

2.8 TERMINAL QUESTIONS

2.1 OBJECTIVES

After having the detailed study of this unit you will be able to

- Understand the world's great natural regions
- Understand the world based on the demarcation of natural regions
- Describe in detail the world's largest natural regions and their size limits.

2.2 INTRODUCTION

Natural regions are areas of the earth's surface where natural elements are similar, homogeneous, or uniform. Within a natural region, terrain or relief, climate, soil, natural vegetation, and so on are found to be grossly similar or homogeneous in nature. Natural elements influence human life and activity. This explains why human existence, economy, business, culture, and so on are nearly same in similar natural places.

A. J. Herbertson, a British geographer, undertook the first significant attempt to determine the world's natural regions in 1905. Herbertson, a professor at the University of Oxford, is regarded as the determinant of key natural zones around the world. In 1904, he presented a study paper on the natural areas of the world to the Royal Geographical Society, which was published in the prominent geographical publication 'Geographical Review' the following year. The article was titled 'Major Natural Regions: An Essay in Systematic Geography'. Herbertson insisted on using the natural region as a unit of geographical research. According to him, there is a clear relationship between inorganic components and organic elements (vegetation and fauna) in a natural environment, which is described by the regular ecology of natural flora and fauna. Herbertson also pointed out that natural zones are relative, rather than absolute. Herbertson defined natural regions of the earth mostly based on natural vegetation, although he considered that a natural region has a general (gross) homogeneity of surface structure, topography or relief, climate, natural flora, and animal life. According to him, homogeneity in natural conditions within a natural region leads to homogeneity in the social, economic, and cultural situations of the people who live there. In this approach, Herbertson extensively explored the distinct link between natural regions and humans, attempting to demonstrate that both are interconnected.

Later geographers, particularly his Oxford sect disciples, made changes to Herbertson's concept of natural regions and recognized the importance of the human element in describing the interaction between natural areas and people. This was done because, in subsequent research, Herbertson began to embrace human value and stated the belief that human activities reveal the amount of economic growth. Herbertson's contemporaneous British geographer Unstead (J. F. Unstead, 1916) made significant contributions to expanding on this concept. He believed that any regional classification scheme must consider both natural and cultural characteristics and be based on a combination of the two.

Many geographers consider natural region and physical region to be synonyms, despite the fact that the two terms have fundamentally different meanings. It is well understood that the physical region is determined by structure, relief, and drainage, whereas climate and natural vegetation are more important in determining the natural region. As a result, it appears reasonable and useful to interpret the natural region in a distinct manner from the physical region.

2.3 BASIS OF DEMARCATION OF NATURAL REGIONS

Natural regions are defined based on shared natural traits. Climate is the most powerful natural element, with major effect from latitude and surface conditions. Climate has an impact on and controls the soil, as well as the natural flora and wildlife. Thus, even if climate is regarded the primary basis for demarcating natural zones, other related characteristics can be used to aid in the process. The elements listed below can be used as criteria to define the world's natural regions.

1. Latitudinal and Continental Location

Natural regions are determined mostly by their latitudinal and continental positions. The latitudinal position determines the climate, whereas the continental position serves as an auxiliary component. This is why natural areas, climate regions, natural vegetation regions, and so on, expand east-west along latitudes.

Found in the western direction. Examples include tundra regions, taiga regions, and equatorial regions. Continental location includes ocean coasts, intercontinental locations, insular locations, and so on. The natural environment (climate, vegetation, etc.) varies greatly depending on continental position, resulting in diverse natural areas. Different natural zones emerge as a result of the continent's position at the same latitude.

2. Climate

Climate is the most important factor in the natural environment. Temperature, humidity, rainfall, prevailing winds, and variability are the primary climate factors that influence physical and biological functioning. These climatic components work together to determine a region's vegetation and biosphere. This is why diverse regions of the world are organized into climatic zones, and natural regions are typically called by climatic conditions. Climate significantly influences soil and vegetation type. Along with natural conditions, climate is one of the most important factors influencing human health, residence, occupation, and activities. Climate has a direct impact on crop variety, production method, and yield, among other factors. The demarcation of hot equatorial regions, hot monsoon regions, hot desert regions, Mediterranean regions, taiga regions, tundra regions, and so on is mostly determined by climate.

3. Natural vegetation

Climate and soil have a significant impact on natural vegetation. Climate has such a significant impact on it that it has become a companion to climate. Generally comparable climates similar types of plants grow throughout the state. Natural vegetation encompasses trees, shrubs, grasses, algae, and lichen. Trees and plants make the most significant contribution to environmental balance. Furthermore, only locally sourced trees and plants can meet the basic needs of humans living in various places, such as food, clothing, and shelter. The regional plant kinds also influence a variety of human vocations such as agriculture, animal husbandry, hunting, and the manufacturing industries. As a result, natural vegetation can be employed as appropriate criteria in the demarcation of natural of the world.

Herbertson has made natural vegetation the primary basis for demarcating huge natural regions around the planet. The reason for this is that a region's general vegetation type more properly reflects its climate, soil, human occupation, and so on. This leads to a greater degree of linkage and resemblance between botanical and natural regions. Natural vegetation has been used to define cool tundra regions without vegetation, taiga regions with angular forests, steppe or grassland regions with temperate soft and short grasses, hot desert regions without vegetation, and equatorial regions with tropical rain forests, among other things. Thus, it is obvious that, like temperature, natural vegetation serves as an important foundation for defining natural regions.

2.3 MAJOR NATURAL REGIONS OF THE WORLD

British geographer A. J. Herbertson determined the world's natural regions for the first time in 1905. He used natural vegetation as the primary parameter in his classification. Although certain changes have been made to the criteria used for area demarcation in recent years, the demarcation and interpretation of huge natural regions around the world can be done easily using Herbertson's method as stated. Herbertson categorized the world into 15 main ecological zones. Compare the number of natural regions and their territorial extension among geographers.

Let's go. Therefore, only the generally accepted classification has been used here. In this way the world's largest (Following are the natural regions:

A. Tropical Regions

1. Equatorial region
2. Savanna region or Sudan-like region
3. Tropical Monsoon Region
4. Hot desert or Sahara-like regions

B. Warm Temperate Regions

5. Mediterranean region

6. Temperate desert region

7. Region like China

C. Cool Temperate Regions

8. Region equivalent to West Europe

9. Prairie equivalent region

10. St. Lawrence equivalent region

D. Cold Regions

11. Taiga-like region

12. Tundra Region

13. High Mountain Region

2.3.1 EQUATORIAL REGION

1. Position and extent

Equatorial or equatorial regions are found between 5° north and 5° south latitude on either side of the equator. In some locations, this region reaches 10° north and 10° south latitude. It encompasses South America's Amazon and Orinoco Valley, Central America, Africa's coastal Indian Gulf, and southeast Asia (Malaya, Indonesia, the Philippines, and so on). The Amazon Basin contains the majority of the equatorial region; hence, it is also known as the Amazon region.

2. Natural conditions

Because of its location near the equator, the sun's rays fall perpendicularly throughout the year, resulting in high temperatures. The average temperature is 27 degrees Celsius; however, the annual temperature variance is typically less than 3 degrees Celsius. It is always summer here, with no winter season. The lengths of the day and night are nearly identical. The daily temperature variation remains between 5° and 10° because, due to the convergence of winds in this belt, air pressure remains high while winds remain quiet. Move slowly from west to east.

Every day after midday, there is heavy rain, followed by thunder and lightning, generally around 3–4 p.m. This is known as convective rain, and it usually occurs at a specific time each day. The average annual rainfall in these regions exceeds 200 cm, with some areas receiving 300 to 530 cm. Even then, it puts.

The tropical climate favored the growth of broad-leaved evergreen forests in equatorial regions. Selvas trees are thicker and higher, with umbrella-shaped crowns that prevent sunlight from reaching the ground. Equatorial woodlands are known as rain forests. Their timber is

exceptionally robust and durable. These woods contain trees such as mahogany, rosewood, gattapachi, cane, palm, cinchona, ebony, bamboo, and rubber. The timber from these trees is not suitable for building construction. These woods' trees range in height from 60 to 80 meters, and they are covered in various creepers.

Equatorial forest areas are home to a diverse range of creatures. Tree-dwelling species include monkeys, ants, bats, butterflies, birds, lizards, and chameleons. Snakes and pythons are among the most common terrestrial crawling organisms. Rhinoceros, elephants, wild boars, lions, leopards, and otters are among the largest land mammals. Marshy environments and water bodies are home to insects, mosquitoes, flies, hippopotamus, crocodiles, fish, and other creatures. Equatorial rain forests are home to a variety of dangerous species, including flies, mosquitoes, and snakes.

3. Human response

Equatorial regions are the world's most backward in terms of economic growth due to their harsh tropical climate, dense forest cover, quantity of dangerous species, and so on. The population residing in these forest-covered areas is quite small. The population is concentrated on the margins of forests, rivers, coastal areas, and islands. Indonesia and the Philippines are the most heavily inhabited and developed countries in Malaysia and the eastern islands. Because of a scarcity of permanent agricultural land and an abundance of forest lands, shifting and plantation agriculture are most common in tropical climates. These regions' principal agricultural products include rice, maize, sugarcane, hot spices, tea, coffee, cocoa, cinchona, pineapple, rubber, palm, and coconut. Rubber, tea, coffee, coconut, and hot spices are among the crops used in plantation agriculture.

Because of dense woods and marshy terrain, the development of land transport (rail and road) in equatorial countries is severely constrained. In many areas, rivers provide the path. In Southeast Asia, Malaysia and Indonesia have seen a higher expansion of roads and railways than other countries. Rubber, tea, coffee, spicy spices, coconut oil and nuts, ivory, sugar, and tin are among the products exported from the tropical regions.

Many primitive tribes reside in uncivilized equatorial forest regions and lead wild lives. Pygmies can be found in the Congo Basin of Africa, Bora and Red Indians in the Amazon Basin of South America, and primitive tribes known as Semang and Sakai in Malaya and Chile. Pygmies are members of the Negrito species, which is distinguished by its relatively low stature (132 cm or 52 inches), earning them the nickname dwarfs. These black-colored people live in trees and obtain their sustenance by hunting wild animals and birds, as well as by eating tree fruits, flowers, leaves, and roots.

The Semang and Sakai tribes, both of the Negrito species, dwell in Malayan and Thai woods. In addition to harvesting roots and fruits from trees, these people capture fish from bodies of water and hunt small creatures such as pigs, monkeys, rats, squirrels, and so on.

Malaya, Indonesia, and the Philippines are more developed than other equatorial regions due to their more accessible location and influences from ancient and modern cultures. Java is Indonesia's most developed and highly inhabited island. Commercial plantations and general agriculture, as well as the extraction of natural resources like tin, have significantly accelerated and boosted economic development in this area, as has the discovery of petroleum reserves. The eastern islands' major cities are Singapore, Jakarta, Kuala Lumpur, Manila, Mindanao, and Surabaya. In Africa, population settlement in Nigeria's southern region is likewise relatively strong in pace with economic growth. Similar to the eastern islands, urbanization has been relatively high here.

2.3.2 SAVANNA REGION OR SUDAN TYPE REGION

1. Position and extent

The Sudan region of Africa has the biggest swath of tropical grassland, with dense, tall grasses known as savanna. This is why the region is known as the Savanna Grass Region. Sudan-like regions can be found between 10° to 20° north and 10° to 20° south latitude in both the Northern and Southern Hemispheres. This type of grassland can be found in Sudan (Savannah), Kenya and Uganda in East Africa, Colombia (Lanoj), Brazil (Compass) in South America, and the Australian state of Queensland.

2. Natural conditions

The Savanna climate is characterized by high temperatures throughout the year, as well as distinct dry and wet seasons. Summer temperatures range from 30° to 38° Celsius, while winter temperatures often remain above 20° Celsius. The dry season in this region is long (7-8 months), and rainfall is often scarce throughout that time. The wet rainy season accounts for 80-90 percent of total annual rainfall. The amount of rainfall varies greatly between Savanna regions around the world, owing to surface structure and distance from the equator. The average annual rainfall varies by location, ranging from 75 to 200 cm.

Thick, stiff, and tall grasses are common in the Savanna region. Grass leaves are flat and measure 80 cms in height (length). Or even more is discovered. Elephant grass is the tallest, reaching up to 5 meters, and elephants hide under it. The stems of these grasses are pulpy. In the Savanna region, the entire surface is not covered in a continuous layer of grasses; rather, there is bare ground in between. The grasses' leaves fall during the dry season, and as soon as the dry season starts, new green leaves develop. These plants have extensive roots that go deep into the soil. Bushes and trees grow throughout the grassy spaces. The nature of trees is dependent on the availability of water. The trees typically grow to a height of 10 to 15 meters, with little branches

emerging from the stem. The Savanna region is classified into four categories based on the ratio of grasses to trees in each area. (1) Forest Savanna; (2) Tree Savanna; (3) Shrub Savanna; and (4) Grass Savanna.

The largest variety of large grazing animals is found in the African Savanna. Large herds of zebras, giraffes, antelope, hippopotamus, deer and elephants are found here. In American and Australian Savannah, the above mentioned animals are found less and the number of birds is more. Kangaroo dominates the large terrestrial animals in Australia. Due to wide grass areas and less number of trees in the Savanna regions, animals are more mobile.

3. Human response

In areas like Sudan, animal husbandry and agriculture are the main occupations of the people according to the availability of grass, amount of rainfall, soil fertility etc. In many places, grasses are eliminated and various types of crops are grown, while animal husbandry is prevalent in most parts. Major crops include rice, maize, pulses, coarse grains etc.

In the grassy areas of East Africa (Kenya and Tanzania), there is a majority of people of 'Masai' tribe. The animals reared by them are mainly buffaloes. Apart from this, cows and sheep and goats are also reared and grazed on pastures. They keep traveling with the animals from one place to another to raise sheep and goats for meat and wool. Each Maasai family has a separate herd of animals. The Maasai raise buffalo and cows for milk and sheep and goats for meat and meat. According to local achievements, meat and milk play an important role in the diet of the Maasai. The economic status and social organization of the Maasai is stronger than that of other hunter-gatherer tribes of Africa. In South America, the Brazilian plateau (Compass) and the Orinoco basin of Colombia have been cleared of grass and cultivation of maize, barley, millet, sugarcane etc. has started. Along with farming, farmers also do animal husbandry. Animal husbandry business has developed in the grassland areas of Queensland, Australia. This is compatible with the environment there.

2.3.3 TROPICAL MONSOON REGION

1. Position and extent

The monsoon zone is located between 5 and 30° latitude on both sides of the equator. These regions are located within the trade wind belt. There are two separate seasons: winter and summer. The wind direction changes as the seasons change. These regions with seasonal fluctuations are known as monsoon regions. Pakistan, India, Bangladesh, Myanmar, Thailand, Cambodia, Laos, Vietnam, Eastern Islands, Southern China, and Taiwan, Eastern coastal parts of Africa, Florida, Mexico, and Western Islands in North America, and Central America in Asia all fall under the monsoon region. It comprises both the western and northern coasts of Australia.

2. Natural conditions

In hot monsoon regions, the winter is generally cold and dry, while the first part of the summer is hot and dry and the second half is hot and wet. The summer temperatures here often range from 27° to 40° Celsius, while the winter temperatures range from 15° to 25° Celsius. The annual temperature variance maintains between 20° and 30° Celsius. These places are located in the belt of southerly trade winds, and the winter season is often dry. Rainfall in these areas typically occurs in the latter half of the summer. The majority of rainfall (more than 85 percent) falls during the summer, hence the term "rainy season." Cyclonic winds are responsible for monsoon rainfall, 250 to 500 centimeters on Windward Mountain slopes. The average rainfall is 100 cm, while the windward areas receive only 100 to 150 cm.

Elephants, rhinoceros, lions, leopards, deer, nilgai, monkeys, and wolves are among the large species found in monsoon forests. Domesticated animals can be found in the plains, including the world-renowned cow, buffalo, horse, camel, goat, sheep, and pig. The majority of quadrupeds are found only in monsoon climates.

A variety of plants grows in monsoon regions as a result of the high temperatures and abundant rainfall. Evergreen forests are found in locations with more than 200 cm of rainfall, but they are less dense than equatorial rain forests. These forests, which include rosewood, sal, teak, mahogany, rubber, bamboo, and cane, grow in places with 100 to 200 cm of rainfall. There are broad leaf deciduous forests with trees such as Sal, Teak, Shisham, Jamun, Mahua, Mango, Semal, Neem, and so on. Deciduous trees such as Acacia, Plum, Kikar, Neem, and Mahua grow alongside grasslands in places with less than 100 cm of rainfall. Large species such as elephants, rhinoceroses, lions, leopards, deer, nilgai, monkeys, and wolves thrive in monsoon forests. The plains are home to domesticated animals such as cattle, buffalo, horses, camels, goats, sheep, and pigs. The majority of the world's quadrupeds live only in monsoon zones.

3. Human response

Agriculture and animal husbandry are the most common occupations in the monsoon region. Crops cultivated on alluvial plains and other agricultural areas depend on the amount of rainfall. These regions' cash agricultural goods include tea, coffee, tobacco, sugarcane, groundnut, and garam masala, among others. Fruit trees include mango, litchi, banana, papaya, guava, jackfruit, apple, grapes, and lemon, among others. Monsoon regions produce over 95% of the world's jute, 70% of rice, and 75% of sugarcane. Irrigation is necessary due to the dry season and the uncertainty of rainfall. Subsistence agriculture is widely practiced in these places due to high population density and limited land per capita. Along with food production, farmers raise a variety of animals for milk, meat, and riding, including cows, buffaloes, sheep, goats, camels, horses, mules, donkeys, pigs, and chickens, among others.

Monsoon regions provide a variety of minerals, including industrial minerals such as iron, manganese, bauxite, tallow, and tin. Power resources (coal, petroleum, natural gas, etc.) and

precious minerals (gold, silver, etc.) are of greater importance. Many manufacturing businesses have emerged as a result of the availability of industrial minerals and power resources, the most prominent of which are the iron and steel, aluminum, glass, and cement industries. Cotton textile, paper, jute, sugar, and other agricultural sectors are well-known in India. Aside from this, a variety of sectors relating to chemical engineering and electronics have emerged. Monsoon regions are essential in international trade because they supply the majority of food items, spicy spices, and industrial raw materials to the world's major industrialized countries. And, due to their large populations and underdeveloped economies, these countries import a wide range of manufactured items such as machinery, medications, electronic goods, motor cars, and so on.

In monsoon regions, there is a high population density. Agricultural produce meets the basic needs of life in monsoon regions thanks to fertile soil and a favorable environment. The monsoon environment makes agricultural work easier here because it allows for the production of at least two crops per year. Many agricultural-related cottage industries have traditionally evolved in these locations. As a result, these locations are capable of supporting a sizable population. India, Pakistan, Bangladesh, and Southern China are highly populated areas, with 60 to 80 percent of the inhabitants working in agriculture and living in villages. Many industries have evolved in these countries, and large cities and ports have been established. Asia includes cities such as Mumbai, Kolkata, Chennai, Delhi, Bangalore, Ahmadabad, Nagpur, Bangun (Rangoon), Colombo, Karachi, Bangkok, Sagaon, Hong Kong, Hanoi, and Nanking. Repodi, Santos, Caracas, Salvador, etc. in South America. Notable cities in Australia include Townsville and Rockhampton, while in Africa, Mozambique and Antananarivo.

2.3.4. HOT DESERT OR SAHARA TYPE REGION

1. Position and extent

Hot desert regions are found in the western parts of the continents, between 15° and 30° latitude, on both sides of the equator. It comprises Thar, Sindh, and Southern Baluchistan in Asia, the Arabian Peninsula, the Sahara and Kalahari Deserts in Africa, the Western Desert of North America, the Atacama Desert in South America, and the Western Desert of Australia. This sort of territory is most widespread in Africa's Sahara Desert, which is why it is also known as the Sahara-like region.

2. Natural conditions

Hot deserts are distinguished mostly by their year-round dryness. The reasons why these arid zones are found in the western parts of the continents are as follows:

(i) Mid-latitude cyclones that cause rainfall do not get here; (ii) These areas are far from the continents' eastern shores, therefore eastern wet zones do not reach here. Ocean winds cannot get here; (iv) frigid currents travel near the continents' western shores, causing winds from the west to become frigid and unable to bring rain since they are dry. Hot desert locations have two separate seasons: summer and winter. Summer temperatures average between 30° and 37°

Celsius, with occasional highs of 50°. At night, the temperature decreases to 20 to 25 degrees Celsius. So far, the highest recorded temperature in Al-Azizia (Libya) has been 58° Celsius. During the winter, daytime temperatures range from 15° to 22° Celsius, occasionally exceeding 27° Celsius, while nighttime temperatures drop to 8° to 10° Celsius. The night temperature in the broad sandy stretches drops dramatically, reaching -30° Celsius. Thus, annual and daily temperature changes are greater in hot desert regions. The typical annual temperature variance is 16° to 22° Celsius, whereas the daily temperature variation is from 20° to 30° Celsius. Although it sometimes reaches more than 40 degrees Celsius. In scorching deserts, annual rainfall is extremely low and unpredictable. The average yearly rainfall in some places is 25 to 40 cm.

In contrast, several locations have received only minimal rainfall over many years. In most sections of the Sahara, annual rainfall is 10 cm or less. Some deserts, such as Thar (India-Pakistan), experience regular flow as a result of sudden significant rainfall. Difficulty creates significant flooding. The sky in these desert places is typically cloudless, resulting in strong sunshine all year.

The tropical desert's hot and dry climate is unsuitable for vegetation growth; hence most desert locations are either devoid of vegetation or can only support bushes. Such vegetation thrives here that can tolerate prolonged droughts. Their roots are lengthy, allowing them to collect rainwater from deep. The stem's bark is thick, and the leaves are few, tiny, smooth, and thick, with small thorns. Oasis and humid environments also support trees such as date palm, acacia, tamarisk, kikar, and plum.

Because of the scarcity of water in desert environments, animal life is extremely boring. Camel is the region's major domesticated mammal, capable of surviving for several days without water. It is the primary mode of transportation for people and goods in the desert, moving at tremendous speeds. This is why the camel is known as the ship of the desert. Other famous creatures include ostriches, rabbits, antelope, jackals, and rats.

3. Human reaction

The majority of hot deserts are sandy and desolate. The intense heat and dryness make survival extremely tough. Agriculture is practiced in the centre of the desert, where water sources or oases can be discovered, or where water from rivers, lakes, and other bodies of water is available for irrigation, and as a result of the availability of water, more people move there. Permanent settlements are only found in irrigated agricultural areas where people make a living from permanent agriculture and animal husbandry. Jowar, millet, cotton, tobacco, sugarcane, watermelon, alfalfa grass, vegetables and delicious fruits are grown in these areas. Egypt, located in the eastern part of the Sahara Desert, uses canals to cultivate land next to the Nile River. That is why Egypt is known as the "gift of the Nile River."

Many people in desert locations do animal husbandry, raising sheep, goats, horses, camels and cows and living nomadic lives from one pasture to the next. Most deserts have saltwater lakes, which dry out and generate saltwater rocks on the surface. This is how salt is

extracted from salty lakes. Sambhar Lake in Thar (Rajasthan), Lake Chad in the Sahara, and Salt Lake in the United States are all famed for their salt deposits. Mineral oil is extracted in large quantities from the Persian Gulf's coastal countries (Saudi Arabia, Kuwait, Iraq, and Iran), as well as North African countries such as Libya, Algeria, and Egypt. The coastal countries of the Gulf have become the richest countries in the world by exporting mineral oil (petroleum)

In the Arabian Desert, primitive tribes known as Bedouins and Bushmen reside in the Kalahari Desert. Bedouins are nomadic pastoralists who grow camels, goats, sheep and horses and purchase necessities from desert farmers by selling their animals and animal products. They do not create permanent dwellings and instead relocate with their family and livestock, erecting tent homes wherever they live. Hunting native animals and birds is how the tribe Bushmen of Kalahari in Southern Africa gain nourishment.

Most desert populations are found in oases, irrigated areas, mining centers and coastal cities. In many desert countries, mining cities have developed near sources of useful minerals. Most of the desert population is found in desert areas, irrigated areas, mining centers and coastal cities. In many desert countries, mining cities have sprung up near sources of useful minerals. Where essential facilities are provided from remote parts. Kalgoorlie and Koolgardy (gold mines) in Australia, Baghdad, Basra, Aden, Mecca, Medina, Dubai, Karachi, Jodhpur, Bikaner etc. in Asia, Timbuktu, Cairo, Kano, Port Said, Alexandria etc. in Africa, hot spots of South America Lima etc. in the deserts. Major cities are located.

2.3.5. MEDITERRANEAN REGION

1. Position and extent

The Mediterranean region extends between 30° and 40° latitude on both the northern and southern hemispheres of the continents. Because the most significant area of this type is next to the Mediterranean Sea, it has been given the name Mediterranean Sea. Spain, Portugal, Southern France, Italy, Greece, Western Turkey, Syria, Western Israel, Algeria (Atlas region) of North-Western Africa, North America includes southern California, and South America includes central Chile, southern and southwestern Africa, and southwestern and southeastern Australia.

2. Natural conditions

The fundamental characteristics of the Mediterranean climate are rainy winters and dry summers. The average temperature in winter is 5° to 10° Celsius, while in summer it is 20° to 27° Celsius. The annual temperature variation is reported to be between 15 and 20 degrees Celsius. In these places, temperatures normally remain above freezing in the winter, though frost can occur when temperatures dip too low at night. The Mediterranean climate is mostly due to seasonal fluctuations in the air pressure belt. During the summer, due to the Sun's Uttarayan position, all air pressure belts shift northward.

At that point, the westerly wind belt shifts to the north of the region, subtropical high pressure sweeps across it, and dry winds blow from land to sea, resulting in no rainfall. During

the winter season, when the air pressure belts shift southward, these places become dominated by westerly winds, and the advent of humid westerly winds brings heavy rain. As a result, the majority of rainfall falls during the winter, while the summer is typically dry. The average annual rainfall in these locations ranges between 35 and 75 cms. In some areas, it ranges from 80 to 150 cms. Rainfall has been received until now.

This type of vegetation grows in the Mediterranean Sea Plate countries as a result of the rainy winter season and the dry summer season, and it is dependent on winter rains while also protecting itself from the high heat and rays of summer. The plants found here have lengthy roots that may reach moisture deep down. These have fewer, smaller, smoother leaves, and thicker barks, resulting in less evaporation. The trees are low in height, yet their branches are fully spread. This form of vegetation occurs in Mediterranean locations with a rainy winter and a dry summer, relying on winter rainfall while protecting itself from summer's high heat and sunlight. The plants found here have lengthy roots that may reach moisture deep down. These have fewer, smaller, smoother leaves, and thicker barks, resulting in less evaporation. The trees are low in height, yet their branches are fully spread. These regions' trees include walnut, chestnut, oak, cypress, and cedar. Many regions have shrub thickets made up of tiny trees known as maquis in the Mediterranean and chaparral in California. Grass also grows in areas that dry up in the summer. Juicy fruits such as lemon, orange, olive, grapes, apricot, and fig are abundant throughout the Mediterranean.

3. Human reaction

The Mediterranean areas are known as areas of Efforts. The temperate climate, lush soil, and abundance of natural resources such as minerals and reservoirs make it appropriate for human life. This is why agriculture and fruit production, which began in ancient times in Mediterranean countries such as Greece and Rome, are the primary occupations in the equatorial areas. Wheat, barley, oats, maize, and tobacco are the principal agricultural crops grown here throughout the winter. Rice is also produced in relatively humid climates where irrigation is available. These locations are well-known for growing luscious fruits. These regions produce a lot of grapes, apples, oranges, olives, lemons, and pomegranates. These locations are known as fruit storehouses.

Almost all Mediterranean countries produce pricey spirits from crops such as grapes and barley. As a result, the state is regarded as the global centre of fruit production and winemaking. Along with agriculture, animal husbandry is practiced in these places. Many states have seen significant growth in the meat, milk, and butter industries. Various sorts of industries based on local products have also been adequately developed, including fruit drying and packing in boxes, meat, butter and milk industries, spirits production from fruits such as grapes, silk industries and so on, houses of fruits.

The plains and flat coastal areas of the Mediterranean have higher population densities. Most of the countries featured here have more than 60% of their people living in cities. Large cities are positioned along coastlines and serve as ports. Important cities include Istanbul,

Athens, Naples, Rome, Marseille, Barcelona, and Valencia in Europe; Cape Town, Algiers, and Tunis in Africa; Los Angeles and San Francisco in North America; Valparaiso and Santiago in South America; and Perth, Melbourne, and Adelaide in Australia.

2.3.6 CHINESE TYPE REGION

1. Position and extent

China is considered a humid subtropical region. The expansion of these regions occurs in the eastern section of the continents between 25° and 40° latitude in both the Northern and Southern Hemispheres. These regions have dry deserts in the west, monsoons in the south, and humid continental climates in the north. The most significant extension of this sort of terrain is in south-eastern China, from which it is named. This encompasses south-eastern and southern China in Asia, the Po and Danube Basins in Europe, the south-eastern United States of America in North America, south-eastern Brazil and Uruguay in South America, the south-eastern region of Africa, and south-eastern Australia. Territories are included. It is well known that a location such as China is normally located in the same latitudes as the Mediterranean region; the distinction between the two is that the former is located in the continent's east, while the latter is located in the continent's west.

2. Natural conditions

Hot ocean currents move across coastal locations such as China, affecting the surrounding areas, because to their proximity to the ocean, these locations experience relatively little annual and daily temperature change. The average summer temperature is between 24° and 27° Celsius, with the peak reaching 42°. Because of cloud cover at night, temperatures rarely drop, and the summer season is excruciatingly hot. Rainfall occurs throughout the year, however the most of it happens during the summer. In the winter, temperatures are moderately cold. The average winter temperature varies by location, ranging from 3° to 15° Celsius. The advent of polar winds during the winter season causes the temperature in some regions to drop to zero degrees Celsius (freezing point).

In areas such as China, the average annual rainfall ranges between 75 and 150 cm. It is located between. The amount of rainfall reduces from the sea coast to the inland areas. The majority of rainfall comes during the summer months, and it is convectional in nature, with lightning and thunder accompanying the rain. These areas also get some rain from tropical cyclones. Winter rainfall is typically cyclonic in nature.

Because of the high temperatures and abundant rainfall, various species of plants have thrived in countries such as China. Dense forests grow in locations with significant rainfall, whereas little trees and grasses thrive in areas with regular rainfall. These regions contain mixed forests with both broad-leaved and sharp-leaved trees. Broad leaf forests have both deciduous and evergreen trees. Mixed woods contain trees such as cypress, ash, chestnut, pine, and oak. Currently, most of the forests have been removed, and agriculture has begun on those grounds.

3. Human response

The region's climate is sub-humid, comparable to China, with moderate cold in the winter and moderate heat in the summer, ideal for human development. Crops can be grown year-round in some places. The state is well-known for its intense agriculture thanks to the adequate irrigation infrastructure provided by canals drawn from rivers. In China, intense subsistence farming is practiced in the traditional Eastern method, with a greater emphasis on human labor. Rice is the primary crop here, and in irrigated regions, two crops are cultivated simultaneously. In the United States, contemporary agriculture is carried out on a huge scale with machinery, and commercial farming of corn, cotton, tobacco, and other crops takes place on large farms.

China, for example, has seen significant economic expansion, as well as the development of many sectors. Aside from China, other regions are classified as developed countries, with a high human quality of living. These regions have a higher than 70% urbanization rate.

2.3.7 TEMPERATE DESERT REGION

1. Position and extent

Temperate deserts are found between 30° and 40° latitude in both the Northern and Southern Hemispheres. These regions are found in the continent's interior. The Mediterranean region is located in the west, with areas such as China in the east. This includes Iran, Turkestan, Afghanistan, Baluchistan, Tarim Basin, Gobi Desert, and the Sinkiang region of China in Asia; it also includes the Mexican Plateau and Great Basin in North America, the Patagonia Desert in South America, the Weald Highlands of South Africa, and the plateau region of New South Wales in Australia. It is also known as a 'Iran-like region'.

2. Natural conditions

Temperate deserts are primarily surrounded by mountain ranges and are found in the interior, distant from oceans. In these areas, the temperature varies greatly during the day. Because of the high altitude, thin air, and clear sky, there is plenty of sunlight during the day, and the surface temperature ranges between 35° and 38° Celsius. Heat is rapidly dissipated at night, causing the temperature to drop below freezing. Summer temperatures normally range between 25° and 40° Celsius. In the winter, the temperature drops too low at night, resulting in snowfall and a hard winter. The average annual rainfall in these locations ranges between 15 and 30 cm.

Temperate deserts are inhospitable to plants other than tiny grasses and prickly bushes due to a lack of moisture. Where rainfall exceeds 25-30 centimeters. There are also wide forests with small trees on the northern Iranian plateau and in Mexico.

3. Human response

In temperate deserts, the most common vocations are animal husbandry and agriculture. Animals such as sheep, goats, cattle, and pigs are raised on these meadows. Commercial animal husbandry has also begun in some areas. Wool is produced from the hair of Merino sheep and goats. In some states, large dams are built to harness water from adjacent reservoirs for irrigation, resulting in the production of various agricultural goods.

Agricultural items include barley, wheat, cotton, maize, rice, sugarcane, tobacco, orange, pear, and grapes, among others. In the United States, wheat, sugar beet, fruits (oranges, grapes, etc.), vegetables, and other crops are irrigated in Snake Valley, Nevada, and Utah. Cotton, barley, wheat, vegetables, and other crops are also grown in Central Asian countries using irrigated agriculture.

Important minerals can be discovered in various locations in temperate deserts, although their availability is limited. Mineral oil (Iran), copper, and other minerals are extracted in Asia, whereas South Africa extracts diamonds, gold, iron, coal, copper, and lead. Gold mines are well-known in Africa, particularly in Johannesburg and Kimberley. Bolivia mines copper, silver, and tin.

2.3.8 WESTERN EUROPE TYPE REGION

1. Position and extent

Regions similar to Western Europe can be found along the continent's western coast between 40° and 65° latitude in both the Northern and Southern Hemispheres. The Mediterranean region is located in the south, the subtropical region to the north, and the dry continental zone to the east. These include the islands of northwest Europe, Denmark, western Norway, northwestern Germany, and western France, as well as Canada in North America. It encompasses British Columbia and the states of Washington and Oregon in the United States, southern Chile in South America, Natal Province in Africa, and New Zealand and Tasmania in Australia.

2. Natural conditions

Ocean currents and prevailing winds have a large impact on the climate in a region similar to Western Europe. The equalizing ocean effect lowers the difference between summer and winter temperatures. As a result, the summer temperature does not rise too high, and the winter temperature does not drop significantly. The average summer temperature ranges from 15° to 21° Celsius, while the average winter temperature ranges from 10° to 18°C. During the winter, nighttime temperatures in the interior can drop below freezing. Frost frequently occurs during the winter months due to low temperatures, and cold waves are typical as polar cold winds arrive. The average yearly temperature variation in these locations is from 5° to 10° Celsius.

Western Europe's regions fall within the westerly wind belt. These winds, which originate in the ocean, bring ample rainfall. The climate here is humid, and rainfall is plentiful and nearly uniform throughout the year in all seasons. The amount of rainfall reduces from the coast to the interior. 200 to 300 centimeters on Windward Mountain slopes. The annual rainfall is until. However, because the windward slope is in the rain shadow, it only receives 50 to 75 cms. of rain. Snowfall can also occur throughout the winter.

In locations such as Western Europe, lush vegetation grows as a result of consistent rainfall throughout the year. These areas were formerly covered in dense forests, but much of the plains have since been cleared and converted into agricultural farms and communities. Oak, Linden, Beech, Elm, Fir, Sus, Mughal Hemlock, and Sidar trees may be found in the plains, and their timbers are soft and useful for industries such as paper and matches.

3. Human response

Western European-like regions are located in temperate climates that are ideal for human existence. Because of its proximity to the sea shore, various ports have developed, providing full facilities for international trade, import, and export of goods. This is why all of the topics covered fall under developed countries, which are well ahead in industry and trade. These states have advanced technological progress and nearly completely developed resources, yet the population-resource ratio is high due to their big population. Because of their small geographical extension, limited resources, enormous population number, advanced technology, and other factors, these regions' economies are mostly resource-intensive. The standard and efficiency here are high. Due to limited resources, extra focus is being placed on their economic use and conservation, and in order to maintain a high quality of life, international trade is being made the primary foundation of the economy, alongside technical advancement and increased efficiency.

High-level industrial growth has become conceivable in areas akin to Western Europe. In these places, industries such as semolina, woolen textiles, iron-steel, engineering, chemical, motor vehicle, and electronics have emerged. More than 80% of the population in these states lives in cities. Coastal locations have seen the development of numerous port cities. London, Manchester, Paris, Amsterdam, Berlin, Copenhagen, Oslo, and other European cities, as well as Seattle, Vancouver, and Portland in North America, Durban in Africa, and Wellington in New Zealand, are large and influential cities.

2.3.9 PRAIRIE-TYPE REGION

1. Position and extent

This region has temperate grassland habitats. The temperate grassland zone extends from 45° to 60° latitude in both the Northern and Southern Hemispheres. These grassland areas are known as Prairie in North America, Steppe in Eurasia, Pampas in South America (Argentina and

Uruguay), Veld (high hilly region) in South Africa, and Downs (Murray-Darling Basin) in Australia. New Zealand's Canterbury Plains also contain temperate grassland areas.

Prairie grasslands grow throughout huge areas of the United States and Canada, between the Rocky Mountains in the west and temperate deciduous woods in the east. The steppe grassland region of Eurasia spans from Eastern Europe to Western Siberia. Pampas is found in Argentina and Uruguay. In South Africa, the veld (high hilly region) covers the southern Transvaal and surrounding mountains. The Downs are a vast stretch of grassland in Australia's Murray-Darling Basin.

2. Natural conditions

Continental climate predominates in the temperate grasslands of the Northern Hemisphere, but continentality has less influence on the climate of the Southern Hemisphere grasslands. Summers in these plains are extremely hot and dry (18° to 21° Celsius), while winters see the area covered with snow as temperatures drop below freezing (up to -10° Celsius). The average annual rainfall in temperate grassland regions is 50 cm. It is found, however in certain more humid areas it is 75 cm. until it rains. Snowfall is another sort of rainfall. Spring brings typical rains, and the soil becomes wet as the snow melts. Green grass sprouts on the surface in the spring as a result of snowmelt and rain, and it blooms with a variety of flowers. Until the beginning of summer, as long as there is rain, the grasses remain green, but when the temperature becomes too high, the grasses scorch and the entire land turns brown. During the winter, the grasslands are blanketed with snow.

These grasslands are home to grass-eating animals with the ability to sprint quickly. Predators in these habitats include herbivorous creatures like as deer, ostriches, horses, mules, and nilgai, as well as others who rely on them. Carnivorous animals include foxes, wolves, leopards, lions, and hyenas. Animals are found

3. Human response

"The grasses of temperate grasslands are short and soft, making them easy for animals to graze while remaining nutritious. Therefore, these places are particularly ideal for animal farming. Due to the low rainfall and semi-arid climate, black soil known as chernozem is found beneath the short grasses that grow in these areas. This soil is fertile because it contains a higher concentration of organic materials. The surface of temperate grasslands is flat, providing ample space for vast agricultural farms and modern agricultural equipment. The population density in these areas varies between 5 and 60 people per square km., because to the low population, there is a labor shortage. The land in these grassy areas is used to grow food grains, primarily wheat. These grasslands are found in developed countries where agriculture and animal husbandry are practiced on a commercial basis. As a result of clearing the grass in the Prairie region's grassy areas, huge agricultural farms have been established, and commercial grain production is carried out on them. Although improved seeds, technology, and contemporary agricultural equipment

are widely used in agriculture, the crop is entirely dependent on rain due to low local consumption. Almost all of the food grains produced are exported, which generates monetary gain.

Thus, the primary characteristics of commercial and profitable agriculture in grasslands are large agricultural farms, full agriculture, the prominence of wheat, a vast farming system, and so on.

Dairy farming is more developed in south-east Australia (the Murray-Darling Basin) and New Zealand's North Island. In these places, good breed cows are raised for milk. Milk products from these locations are exported to North America and Europe, including butter, cheese, and ghee.

2.3.10 ST. LAWRENCE-TYPE REGION

1. Position and extent

It is called after the Saint Lawrence River Basin in North America, where a humid continental climate exists. Its spread occurs on the northern hemisphere's eastern continents between 45° and 60° latitude. In Asia, it spreads up to 55° north latitude. This comprises the coastal provinces of south-eastern Canada (Quebec, Ontario, etc.) in North America, New England in the United States, Manchuria (China), Korea, and Japan's Hokkaido Island in Asia. Aside from that, this type of climate can be found in the southern region of Argentina, South America.

2. Natural conditions

The summer and winter temperature in these regions differ significantly. The typical summer temperature is between 18° and 22° Celsius. The temperature lowers significantly in the winter. The Labrador Cold Current lowers the temperature of coastal Canada and causes the Saint Lawrence River to freeze in the winter. The temperature goes below freezing due to chilly winds from the west, and snowfall persists for many days, resulting in a snowy surface. Thus, the annual temperature variance in these regions ranges from 20° to 40° Celsius.

Rainfall occurs throughout the year in regions such as the St. Lawrence, but it is particularly heavy in the summer. During the summer, cumulonimbus clouds create convective rainfall. Rainfall is typically brief and intense. Winter rainfall is cyclonic, with snowfall accounting for the majority of it. In the coastal portions of Canada and New England, snow covers the ground for around four months throughout the winter. The amount of rainfall decreases from the ocean to the interior and poles. In St. John's and Halifax, it is around 140 cm. Rainfall is lower in the interior areas (50 to 100 cm).

Angled forests can be found along humid coastal locations, whereas grasslands similar to prairies can be found in low rainfall interior areas. Mixed forests can be found in the south, with spruce, pine, and hemlock trees as the dominant species.

3. Human response

Currently, the majority of the forest and grasslands have been destroyed and transformed into agricultural farms. On which agriculture and the dairy industry have grown. Dairy Industry The dairy sector is more developed in the New England region of the United States and in southeast Canada. Because of the uneven topography and less fertile soil, it is considered more suited for animal husbandry than crop production. This area is close to urbanized major industrial belts with a large population. There is a high demand for milk and milk products. As a result, the dairy business has grown significantly in this region. This region is tremendously evolved, and the standard of living for humans is extremely high.

Agriculture is the most common occupation in East Asia, but Manchuria and Korea have seen major industrial development as well. Iron and steel, engineering, electronics, and textiles are among the most notable industries. These states have a high level of life as well, but their economic progress has lagged behind that of America.

2.3.11 TAIGA-TYPE REGION

1. Position and extent

The Taiga-like region (Siberia-like region) is a large zone in the Northern Hemisphere spanning 60° to 70° latitudes. Its spread is found in cold continental or sub polar temperature zones of North America and Eurasia. These areas are covered by angled forests. The slanted woods of Eurasia are known as 'Taiga', and the angled forests are also known as Taiga forests. Eurasia's coniferous forests span from northern Scotland in the west, via Scandinavia and European Russia, to the eastern section of Siberia in the east. Taiga forests in North America extend south of the Arctic tree line, in Alaska and Canada. Thus, the Taiga region is positioned between the Tundra region to the north and the Prairie and grasslands in the south.

2. Natural conditions

The Taiga region, located in high latitudes, is isolated from ocean influence, resulting in a diverse climate. The summer season is brief and cool, whereas the winter season is long, cold, and severe. Summer temperatures range from 10° to 15° Celsius, while winter temperatures remain below freezing. In certain regions, the temperature exceeds 20° to 40° Celsius. Verkhoyansk (Siberia), the world's coldest spot (-60° Celsius), is in this region. The annual temperature variation in this region is extremely high (30° to 60° Celsius).

Water or snows are the most common forms of precipitation throughout the year. Rainfall occurs primarily in the summer and spring. During the winter, precipitation takes the form of snow. These areas typically range from 25 to 50 cm. Rainfall occurs in between. Taiga regions generate coniferous woods that are suited to the climate. These forests contain trees such as pine, spruce, fir, cedar, and juniper. Broad-leaved trees such as beech and aspen can

be found around the southern margins of these woods. To defend themselves from winter snow, these trees' leaves are naturally pointed and bent downward.

The physical structure of animals in the Taiga region allows them to withstand the harsh winter conditions. Most animals have robust skin and dense, long hair. Marine animals are abundant here.

3. Human response

The Taiga region is filled with angled woods whose timber is soft and suited for industrial use. Cutting and sawing wood is more common in Canada, Norway, Sweden, Finland, and Russia (Siberia). These regions have many softwood-based industries, the most developed of which are the pulp & paper and matchbox industries. Canada is a major player in the global paper and pulp industry. Turpentine oil, gum, and birch bark are all key forest products. The majority of economic operations in these regions are focused on forest and wildlife products, as well as the gathering and manufacturing of minerals. All of the European and American countries that make up the Taiga region are industrialized and technologically advanced.

2.3.12 TUNDRA-TYPE REGION

1. Position and extent

Tundra literally means "barren land." It runs from the Arctic (66°30' latitude) to the North Pole in the Northern Hemisphere. This region is situated in the northernmost part of Eurasia and North America. These chilly regions are known as tundra in Eurasia and barren land in North America. The summer 10° Celsius isotherm serves as the southern border for these regions. To the south, there is an area of angled taiga woodland. These areas are also known as Polar lowland or Cold Desert.

2. Natural conditions

Winters in the Arctic are longer, colder, harsher, and more uneventful. Summers are brief and cool. The winter is exceptionally cold for roughly four months (December to March), and the ground is covered in snow. Winter temperatures plunge considerably below freezing, ranging from 30° to -40° Celsius. During the winter, the sun typically remains at or below the horizon, and blizzards are common.

These frigid winds are known to travel at speeds ranging from 150 to 200 km per hour. Summer temperatures continue above zero, averaging 5° to 10° Celsius. As the temperature rises throughout the summer, the frozen snow begins to melt and the surface becomes ice-free.

The Tundra region receives minimal rainfall. Cyclones transform some of the rainfall into snow during the winter. The yearly average rainfall in these locations ranges between 15 and 20 cm. The growing cycle of plants in the tundra environment is extremely short (3-4 months). Soil development is likewise limited here, and the soil layer is extremely thin. As a result, there is little vegetation in this area. When the snow melts in the summer, the ground is covered in small

colorful flowering plants, grasses, lichens, mosses, sedges, and other vegetation. Because of the quick development of plants during the summer, a colorful carpet of flowers may be observed on the ground. Shrub plants like alder, birch, willow, etc., flourish in the southern section of the tundra.

In the north, grassy flora such as lichen thrive. In the north, there is less flora and more snow, sometimes known as desert tundra. The tundra region is home to a variety of animals, including reindeer, musk deer, polar bear, fox, and squirrel. Seals, Walrus Whales, and other aquatic animals are prominent.

3. Human response

The tundra region is utterly unfit for human habitation due to the harsh climate, the majority of the surface being covered in snow, a lack of vegetative growth, and so on. As a result, only a few humans live in a few of its places. The Tundra has an average population density of one person per square kilometer. Is less than. Primitive castes living in various regions rely on locally accessible resources such as fishing and hunting polar animals, among others. Primitive castes such as the Lapps, Finns, Yakuts, Yukadhir Samoyeds, Tungus, Chukchi, and others live in Eurasia's arctic region, while Aleut and Eskimo tribes migrate periodically for hunting. The occupations and lifestyles of the Tundra region's castes are similar, however the Eskimos are more progressive and developed.

Eskimos dwell in North America in the northern shores of Canada and Alaska, as well as the nearby Baffin Islands and Greenland's coastal districts. They keep travelling in search of prey. These people hunt animals and sea creatures with wheel less sledge carts made of bone and hide, as well as watercraft known as kayaks and umiaks. During the winter, Eskimos would create little snow dwellings. This is known as an igloo. Their lifestyle is suddenly changing.

2.3.13 HIGH MOUNTAIN REGION

1. Position and extent

High mountain regions are primarily located in the temperate zone, but due to their elevation, the temperature is cold temperate or tundra (Polar). This sort of region can be found in Asia on the mountain ranges of Pamir and Tibet, Himalayas, Kunlan, Dhyanshan, Elburz, Hindukush, Caucasus, Khingan, and so on; in North America on the mountain ranges of Alaska and British Columbia, Sierra Nevada, coastal ranges, and so on; and in South America. They can be found in the Andes Mountains and on the plateaus of Peru and Bolivia, as well as in the mountains of Scandinavia, the Pyrenees, the Alps, the Carpathians, and other parts of Europe, and in Africa's Atlas Mountains and the Abyssinia Plateau. All of these plateaus and mountain ranges are at an elevation of more than 4000 meters above sea level.

2. Natural conditions

These mountainous places in the temperate zone have a wide range of daily and annual temperatures. During the day, the temperature rises owing to sunlight and hot winds blow, however at night, the temperature drops significantly and cold winds blow, and frost occurs when the wind is quiet. During the day, the temperature in sunny parts rises by 10 to 15 degrees Celsius, while the temperature in shaded areas remains below freezing. In the winter, the temperature remains below freezing, and the evenings are quite cold. The climate on the Tibetan Plateau is harsher than in South America.

The Tibetan Plateau, Peru, and Bolivia experience less rainfall, with an average of 10 to 15 cm. Rainfall only occurs in the summer since frost, snowfall, and other occurrences dominate the winter season. Because of the lack of water, small grasses thrive in high mountain places, while large trees do not flourish.

3. Human response

There is a scarcity of flat, cultivable land in hilly locations. Similarly, in high plateau places such as Tibet, grain productivity suffers due to a lack of rainfall. Short grasses develop in regions that are ideal for animal grazing. These fields get snow-covered in the winter. But it remains green throughout the summer. The occupants of these highlands make their living by herding animals and extracting important products such as milk, meat, skin, horn, wool, and so on.

Seasonal migratory traditions can be observed in higher elevations. Pastoralists raise animals such as sheep, goats and yaks and graze herds of them. The valley meadows dry up in the summer, so these pastoralists travel to higher pastures with their cattle and stay there all summer. They move down to the lower valleys as soon as the winter season begins because the pastures there become covered in snow, but the weather in the valleys remains warm and pastures are available. In this manner, their seasonal movement continues.

The population is very low in the upper mountain and plateau zones. In these areas, where there is limited cultivable land and moisture, agriculture is performed alongside animal husbandry. Grains, legumes, apricot, peach, and potato are among the most common agricultural products. In South America, animal husbandry is particularly prominent on the plateaus of Peru and Bolivia, where animals such as llamas, alpacas, sheep, and goats are raised. These animals produce meat, milk, and wool. High-quality clothing is manufactured from alpaca wool.

Minerals are extracted from various hilly and high plateau locations. Silver, copper, and tin are harvested from the Bolivian Plateau in South America. Peru has several notable copper mines. Rock salt and suhaga can be found on the Tibetan plateau. Because of the difficult terrain, lack of transportation, and scarcity of economic resources, the population in these areas is scarce, and economic development has been slow.

2.4 SUMMARY

The concept of natural regions is extremely important in the field of land. Natural regions make geography studies much simpler and save time. Because of the natural conditions, this form of study is lively and interesting. In many ways, it is still inextricably linked with human life. It is also obvious from this where and how the scientific law of cause and effect is applied in geography. It eliminates the need to study the geography of each country. The geography of the entire earth can be examined in broad groups. According to Hartshorne, "We can only study geography methodically if we focus on natural regions. In general, the geographical conditions of any natural region that affect human life are nearly identical, therefore the economic growth of different parts of the same type of natural region can occur in the same manner. As a result, studying natural regions is critical from an economic and commercial geography approach."

2.5 GLOSSARY

Grasslands - Grasslands are generally open and continuous, fairly flat areas of grass. They are often located between temperate forests at high latitudes and deserts at subtropical latitudes.

Forest - A large area of land covered with trees and plants, usually larger than a wood, or the trees and plants themselves

Taiga - The taiga is a forest of the cold, subarctic region. The subarctic is an area of the Northern Hemisphere that lies just south of the Arctic Circle. The taiga lies between the tundra to the north and temperate forests to the south. Alaska, Canada, Scandinavia, and Siberia have taigas.

Tundra - Tundra ecosystems are treeless regions found in the Arctic and on the tops of mountains, where the climate is cold and windy, and rainfall is scant. Tundra lands are covered with snow for much of the year, but summer brings bursts of wildflowers, plants in tundra's.

Mediterranean - Mediterranean Sea, an intercontinental sea that stretches from the Atlantic Ocean on the west to Asia on the east and separates Europe from Africa. It has often been called the incubator of Western civilization.

Tropical deserts - Tropical deserts are situated on the western margins of the continents between 15° to 30° latitudes north and south of the equator. It is also known as Sudan-type climate.

Equatorial regions - The equatorial regions are located between 0° and 10° latitude on either side of the equator. It stretches in the Amazon lowlands in South America, Congo basin in Africa and the East Indies, from Sumatra to New Guinea. 2. The sun's rays fall perpendicular throughout the year on the equatorial region.

Savanna - A savanna or savannah is a mixed woodland-grassland (i.e. grassy woodland) ecosystem characterized by the trees being sufficiently widely spaced so that the canopy does not

close. The open canopy allows sufficient light to reach the ground to support an unbroken herbaceous layer consisting primarily of grasses.

Tropical rainforest - The tropical rainforest is a hot, moist biome where it rains all year long. It is known for its dense canopies of vegetation that form three different layers. The top layer or canopy contains giant trees that grow to heights of 75 m (about 250 ft) or more.

Mountain - Mountain, landform that rises prominently above its surroundings, generally exhibiting steep slopes, a relatively confined summit area, and considerable local relief. Mountains generally are understood to be larger than hills, but the term has no standardized geological meaning.

Steppe or Temperate Grassland - A steppe is a dry, grassy plain that occurs in temperate climates. A steppe is a dry, grassy plain. Steppes occur in temperate climates, which lie between the tropics and Polar Regions. Temperate regions have distinct seasonal temperature changes, with cold winters and warm summers.

2.6 ANSWER TO CHECK YOUR PROGRESS

1. What is the average density of population found in Tundra?

- A. 100 persons per square kilometer
- B. 01persons per square kilometer
- C. 50 persons per square kilometer
- D. 75 persons per square kilometer

Answer: B

2. The Savana region is influence by the

- A. Tropic of cancer
- B. Tropic of Capricorn
- C. Equatorial belt
- D. Frigid Zone

Answer: C

3. Steppe lands are located in the interior basins of

- A. Asia and America
- B. Africa and America
- C. Australia and New Zealand
- D. Europe and South Africa

Answer: A

4. The Red Indian inhabits which of the following regions.

- A. Savana region
- B. Tropical region
- C. Mid latitude grassland
- D. Steppe lands

Answer: C

5. Which of the following is not included in the St. Lawrence Type region?

- A. China
- B. India
- C. Korea
- D. Canada

Answer: B

6. Which of the following cultivation practices popular in the equatorial region?

- A. Industrial Farming
- B. Terrace farming
- C. Crop rotation
- D. Shifting cultivation

Answer: D

7. The annual temperature in Mediterranean region lies between

- A. 8-16 degree Celsius
- B. 10-17 degree Celsius
- C. 11-19 degree Celsius
- D. 13-20 degree Celsius

Answer: B

8. Which of the following are the chief occupations of the Tundra region?

- A. Trading
- B. Farming

C. Hunting and Fishing

D. Mining

Answer: C

9. Tropical deserts receive on annual precipitation of

A. More than 25.

B. Less than 25

C. Equal to 25

D. No precipitation at all

Answer: B

10. Which is one of the Tribes of East Africa?

A. Jahari

B. Masai

C. Gonds

D. Santhal

Answer: B

2.7 REFERENCES

World Regional Geography - Open Textbook Library (umn.edu)

Books: 'Major world regions' – Grafiati

WORLD REGIONAL GEOGRAPHY - Google Search

2.8 TERMINAL QUESTIONS

Long Answer Type Question

1. How many natural regions are there in the world?
2. What is the largest natural region in the world?
3. How many natural regions are there in the world?
4. What are the main criteria of dividing major natural regions of the world?
5. What are the major natural regions of the world?

Short Answer type Question

1. Why are the natural regions of the world important?
2. How can we protect the natural regions of the world?
3. What is the major natural region of the world?
4. What do you mean by natural region?
5. Why are the natural regions of the world important?
6. What are the four main regions of the world?

UNIT- 3 TRADE & DEVELOPMENT REGIONALIZATION

3.1 OBJECTIVES

3.2 INTRODUCTION

3.3 HISTORICAL CONTEXT AND EVALUATION

3.4 SUMMARY

3.5 GLOSSARY

3.6 ANSWER TO THE CHECK YOUR PROGRESS

3.7 REFERENCES

3.8 TERMINAL QUESTIONS

3.1 OBJECTIVES

After reading this unit, you will be able to:

- Understanding what is trade and its importance.
- Learn about Historical context and evaluation.
- Gain knowledge about world trade organizations.

3.2 INTRODUCTION

Trade and development regionalization refers to the process by which countries or regions form economic partnerships and agreements to promote trade, investment, and economic development within a specific geographic area. This phenomenon has gained momentum in recent decades as countries recognize the potential benefits of regional integration for stimulating economic growth, reducing poverty, and enhancing competitiveness in the global marketplace.

At its core, trade and development regionalization aims to foster closer economic ties and cooperation among neighbouring countries or regions. By pooling resources, sharing infrastructure, and harmonizing trade policies and regulations, participating nations seek to create larger and more integrated markets that can attract foreign investment, spur innovation, and generate economies of scale. Regional integration initiatives often involve the establishment of preferential trade agreements, customs unions, common markets, and economic zones, which facilitate the flow of goods, services, capital, and labour across borders.

One of the primary drivers of trade and development regionalization is the belief that regional economic integration can create a more conducive environment for sustainable development and poverty reduction. By leveraging complementary strengths and resources, participating countries can tap into new markets, diversify their economies, and enhance their competitiveness in the global economy. Additionally, regional integration can foster greater political stability, promote peace-building efforts, and strengthen social cohesion among neighbouring nations.

However, trade and development regionalization also present challenges and complexities that must be carefully navigated. These include disparities in economic development, uneven distribution of benefits among member states, and concerns about sovereignty and national identity. Furthermore, regional integration initiatives may face resistance from domestic interest groups, bureaucratic hurdles, and geopolitical tensions, which can hinder progress and implementation.

3.3 HISTORICAL CONTEXT AND EVOLUTION

The historical context and evolution of Trade & Development Regionalization are deeply intertwined with the shifting dynamics of global trade, geopolitical interests, and economic ideologies over centuries. To understand this evolution, we must delve into key milestones and transformations that have shaped regional integration initiatives from ancient times to the modern era.

Ancient trade routes, such as the Silk Road connecting East Asia with Europe and the Mediterranean Sea routes linking the Middle East, Africa, and Europe, laid the groundwork for early forms of regional economic cooperation. These trade networks facilitated the exchange of goods, ideas, and cultures across vast distances, contributing to the development of thriving commercial centres and cultural exchanges. While not formal regional integration initiatives, these trade routes played a crucial role in fostering economic interdependence and cultural exchange among regions.

The modern era of Trade & Development Regionalization began to take shape in the aftermath of World War II, amid efforts to rebuild war-torn economies and promote stability through economic cooperation. One of the earliest and most influential examples of regional integration was the establishment of the European Coal and Steel Community (ECSC) in 1951 by six European countries. The ECSC aimed to integrate key industries, such as coal and steel, among member states to foster economic interdependence and prevent future conflicts by promoting collaboration.

The success of the ECSC paved the way for deeper economic integration in Europe, culminating in the formation of the European Economic Community (EEC) in 1957 through the Treaty of Rome. The EEC aimed to create a common market among member states, allowing for the free movement of goods, services, capital, and labour. Over time, the EEC evolved into the European Union (EU), which expanded its membership and scope to include a wide range of policy areas beyond trade, such as agriculture, environment, and foreign affairs.

Outside of Europe, other regions also embarked on efforts to promote regional economic cooperation and integration. In Latin America, the establishment of the Latin American Free Trade Association (LAFTA) in 1960 aimed to reduce trade barriers and promote economic development among member countries. Similarly, the Association of Southeast Asian Nations (ASEAN) was formed in 1967 to promote peace, stability, and economic cooperation among Southeast Asian countries.

The 1990s marked a significant turning point in the evolution of Trade & Development Regionalization, as countries sought to capitalize on the opportunities offered by globalization and the liberalization of trade and investment. The signing of landmark agreements such as the North American Free Trade Agreement (NAFTA) in 1994 between the United States, Canada,

and Mexico, and the establishment of the World Trade Organization (WTO) in 1995, signalled a shift towards deeper economic integration on a global scale.

Since then, regional economic integration has continued to evolve and expand, with the proliferation of regional trade agreements, customs unions, common markets, and economic partnerships around the world. Examples include the African Union (AU), the Asia-Pacific Economic Cooperation (APEC), the Southern African Development Community (SADC), and the Pacific Alliance, among others.

Economic factors (market access, economies of scale, resource complementarity)

Market Access: One of the primary economic factors driving Trade & Development Regionalization is the desire to enhance market access for goods, services, and investments. Regional economic integration initiatives aim to reduce trade barriers such as tariffs, quotas, and non-tariff barriers, thereby facilitating the flow of goods and services across borders. By creating larger and more integrated markets, participating countries can benefit from economies of scale, increased competition, and greater access to a diverse range of products and services. Improved market access also enables businesses to expand their customer base, attract foreign investment, and achieve economies of scale in production, distribution, and marketing.

Economies of Scale: Regional economic integration offers economies of scale, which arise when the average cost per unit of production decreases as the scale of production increases. By pooling resources, sharing infrastructure, and harmonizing regulations, participating countries can achieve cost savings and efficiency gains in various sectors, including manufacturing, agriculture, and services. For example, the creation of a common market allows businesses to operate across multiple countries without facing trade barriers or regulatory burdens, enabling them to achieve economies of scale in production, procurement, and distribution. Economies of scale can lead to lower production costs, higher productivity, and increased competitiveness, thereby driving economic growth and development within the region.

Resource Complementarity: Another economic factor driving Trade & Development Regionalization is resource complementarity, which refers to the complementary nature of resources, skills, and capabilities among participating countries. Regional economic integration initiatives often involve countries with diverse resource endowments, comparative advantages, and specialization patterns. By leveraging complementary strengths and resources, participating countries can enhance their competitiveness, promote intra-regional trade, and foster specialization in sectors where they have a comparative advantage. For example, countries rich in natural resources may specialize in primary commodities production, while countries with skilled labour and technological capabilities may focus on manufacturing and services. Resource complementarity encourages cross-border investments, technology transfer, and knowledge sharing, leading to mutual benefits and economic synergies among member states.

Political factors (geopolitical considerations, regional stability)

Geopolitical Considerations:

Political factors play a significant role in shaping trade and development regionalization efforts. Geopolitical considerations refer to the strategic interests and geopolitical dynamics that influence the formation and evolution of regional economic integration initiatives. One of the primary geopolitical considerations driving regionalization is the desire to enhance national security and geopolitical influence. By forming regional blocs and alliances, countries seek to strengthen their collective bargaining power, deter potential threats, and project influence in regional and global affairs. For example, the European Union (EU) emerged as a geopolitical project aimed at promoting peace and stability in Europe following the devastation of World War II. Similarly, the formation of regional organizations such as the Association of Southeast Asian Nations (ASEAN) and the African Union (AU) reflects efforts to foster regional cooperation and stability in politically volatile regions.

Regional Stability:

Another critical political factor influencing trade and development regionalization is the quest for regional stability. Regional integration initiatives are often pursued as a means to promote peace, stability, and conflict resolution among neighbouring countries or regions. By fostering economic interdependence and cooperation, regional integration can reduce the risk of political tensions, conflicts, and instability. For example, the creation of the European Coal and Steel Community (ECSC) in the aftermath of World War II aimed to promote economic cooperation and prevent future conflicts by integrating key industries. Similarly, initiatives such as the Southern African Development Community (SADC) and the Economic Community of West African States (ECOWAS) seek to promote peace and stability in politically fragile regions through economic integration and cooperation. Moreover, regional integration can serve as a platform for diplomatic dialogue, conflict resolution, and confidence-building measures among member states, contributing to regional peace and security. However, achieving and maintaining regional stability through trade and development regionalization requires addressing underlying political tensions, historical grievances, and power asymmetries among member states. Additionally, external factors such as great power rivalry, transnational threats, and regional power struggles can also impact regional stability and influence the trajectory of regional integration initiatives. Therefore, political factors, including geopolitical considerations and regional stability concerns, play a crucial role in shaping the process and outcomes of Trade & Development Regionalization efforts.

European Coal and Steel Community (ECSC)

European Coal and Steel Community (ECSC), an administrative agency established by a treaty ratified in 1952, designed to integrate the coal and steel industries in Western Europe. The

original members of the ECSC were France, West Germany, Italy, Belgium, the Netherlands, and Luxembourg. The organization subsequently expanded to include all members of the European Economic Community (later renamed the European Community) and the European Union. When the treaty expired in 2002, the ECSC was dissolved.

In May 1950 French foreign minister Robert Schuman proposed the establishment of a common market for coal and steel for those countries willing to delegate control of these sectors of their economies to an independent authority. In drawing up what was called the Schuman Plan—which had been authored by Jean Monnet, then head of the French planning agency—French policymakers were motivated by the belief that a new economic and political framework was needed to avoid future Franco-German conflicts. The first step was to be limited, but the ultimate objective was the creation of a “United States of Europe.” West Germany, Italy, and the three Benelux countries subsequently agreed to negotiate based on this plan.

By 1954 the agency had removed nearly all barriers to trade between its members in coal, coke, steel, pig iron, and scrap iron. As a consequence, trade in these commodities rose dramatically in the 1950s. A set of common rules was established to control cartels and to regulate mergers. The central institution, the High Authority, fixed prices and set production limits or quotas and was authorized to impose fines on business firms that infringed treaty rules.

From the 1960s one of the ECSC’s main tasks was to supervise its members’ reduction of their excess production of coal as that mineral was replaced by petroleum as an industrial fuel. This involved the closing of inefficient or uneconomic coal mines in member countries. Similarly, in the 1970s the ECSC began to supervise the elimination of its members’ excess steelmaking capacity when low-cost steel from Japan and other countries put Western European steelmakers at a competitive disadvantage. Under the ECSC’s aegis, an international group of steelmakers, the European Federation of Iron and Steel Industries (Eurofer), was formed in 1977 to rationalize the industry. The headquarters of the ECSC were in Brussels.

European Economic Community (EEC)

European Community (EC) is a former association designed to integrate the economies of Europe. The term also refers to the “European Communities,” which originally comprised the European Economic Community (EEC), the European Coal and Steel Community (ECSC; dissolved in 2002), and the European Atomic Energy Community (Euratom). In 1993 the three communities were subsumed under the European Union (EU). The EC, or Common Market, then became the principal component of the EU. It remained as such until 2009 when the EU legally replaced the EC as its institutional successor.

The EEC was created in 1957 by the Treaty of Rome, which was signed by Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany. The United

Kingdom, Denmark, and Ireland joined in 1973, followed by Greece in 1981 and Portugal and Spain in 1986. The former East Germany was admitted as part of a reunified Germany in 1990.

The EEC was designed to create a common market among its members through the elimination of most trade barriers and the establishment of a common external trade policy. The treaty also provided for a common agricultural policy, which was established in 1962 to protect EEC farmers from agricultural imports. The first reduction in EEC internal tariffs was implemented in January 1959, and by July 1968 all internal tariffs had been removed. Between 1958 and 1968 trade among the EEC's members quadrupled in value.

Politically, the EEC aimed to reduce tensions in the aftermath of World War II. In particular, it was hoped that integration would promote a lasting reconciliation of France and Germany, thereby reducing the potential for war. EEC governance requires political cooperation among its members through formal supranational institutions. These institutions included the Commission, which formulated and administered EEC policies; the Council of Ministers, which enacted legislation; the European Parliament, originally a strictly consultative body whose members were delegates from national parliaments (later they would be directly elected); and the European Court of Justice, which interpreted community law and arbitrated legal disputes.

Members revamped the organization several times to expand its policy-making powers and to revise its political structure. On July 1, 1967, the governing bodies of the EEC, ECSC, and Euratom were merged. Through the Single European Act, which entered into force in 1987, EEC members committed themselves to removing all remaining barriers to a common market by 1992. The act also gave the EEC formal control of community policies on the environment, research and technology, education, health, consumer protection, and other areas.

By the Maastricht Treaty (formally known as the Treaty on European Union; 1991), which went into force on November 1, 1993, the European Economic Community was renamed the European Community and was embedded into the EU as the first of its three "pillars" (the second being a common foreign and security policy and the third being police and judicial cooperation in criminal matters). The treaty also provided the foundation for an economic and monetary union, which included the creation of a single currency, the euro. The Lisbon Treaty, ratified in November 2009, extensively amended the governing documents of the EU. With the treaty's entry into force on Dec. 1, 2009, the name European Community as well as the "pillars" concept were eliminated.

European Union (EU)

European Union (EU) is, an international organization comprising 27 European countries and governing common economic, social, and security policies. Originally confined to

Western Europe, the EU undertook a robust expansion into central and eastern Europe in the early 21st century. The EU's members are Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech

Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the

Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden. The United Kingdom, which had been a founding member of the EU, left the organization in 2020.

The EU was created by the Maastricht Treaty, which entered into force on November 1, 1993. The treaty was designed to enhance European political and economic integration by creating a single currency (the euro), a unified foreign and security policy, and common citizenship rights and by advancing cooperation in the areas of immigration, asylum, and judicial affairs. The EU was awarded the Nobel Prize for Peace in 2012, in recognition of the organization's efforts to promote peace and democracy in Europe.

The EU represents one in a series of efforts to integrate Europe since World War II. At the end of the war, several Western European countries sought closer economic, social, and political ties to achieve economic growth and military security and to promote a lasting reconciliation between France and Germany. To this end, in 1951 the leaders of six countries—Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany—signed the Treaty of Paris, thereby, when it took effect in 1952, founding the European Coal and Steel Community (ECSC). (The United Kingdom had been invited to join the ECSC and in 1955 sent a representative to observe discussions about its ongoing development, but the Labour government of Clement Attlee declined membership, owing perhaps to a variety of factors, including the illness of key ministers, a desire to maintain economic independence, and a failure to grasp the community's impending significance.) The ECSC created a freetrade area for several key economic and military resources: coal, coke, steel, scrap, and iron ore. To manage the ECSC, the treaty established several supranational institutions: a High Authority to administrate, a Council of Ministers to legislate, a Common Assembly to formulate policy, and a Court of Justice to interpret the treaty and resolve related disputes. A series of further international treaties and treaty revisions based largely on this model led eventually to the creation of the EU.

Latin American Free Trade Association (LAFTA)

Latin American Free Trade Association (LAFTA), is an organization comprised of eleven nations dedicated to furthering economic integration in Latin America. Established by a treaty signed in Montevideo, Uruguay, on February 18, 1960, the Latin American Free Trade Association (LAFTA) served as a forum for the creation of greater economic ties among Latin American nations. The Montevideo agreement was initially signed by representatives of Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and Uruguay. Bolivia, Paraguay, and Venezuela became members shortly thereafter.

The treaty signed at Montevideo proposed the gradual easing of trade barriers between the member nations, culminating with completely free trade by 1973. A permanent body was created to facilitate periodic tariff reductions and regular negotiations between the members. LAFTA met with some early success, as these nations had traded very little in the years preceding the agreement. However, progress toward integration moved slowly throughout the 1960s as the disparities of the member nations became more apparent.

Frustrated by the slow process of integration, the LAFTA nations signed the Caracas Protocol in 1969, thereby extending the deadline for free trade to 1980. The divisiveness and imbalance that had threatened LAFTA throughout the 1960s only increased during the 1970s. Many members, whose level of industrialization at this time might be described as intermediate, felt ill-equipped to compete with the large industrialized nations—Argentina, Brazil, and Mexico. The perceived inequity inherent in LAFTA led to the 1969 ratification of the Andean Pact by Bolivia, Chile, Colombia, Ecuador, Peru, and, later, Venezuela, which pursued their agendas for integration independent of LAFTA, an action which further inhibited LAFTA's original goal of free trade throughout the hemisphere. In 1980, the year in which free trade in Latin America was to have occurred, the members of LAFTA formed the Latin-American Integration Association (LAIA), initiating a renewed effort toward integration.

In the early 1990s, the United States began establishing free-trade agreements with individual countries. The most prominent among them was the North American Free Trade Agreement (NAFTA), which created a freetrade zone between Mexico, Canada, and the United States. This new trade again sparked interest in a larger free-trade area of the Americas. Consequently, in 1993 the Organization of American States proposed the Free Trade Area of the Americas (FTAA) to be implemented in 2005. However, as of 2007, political opposition in the United States and Latin America has prevented its adoption. Nevertheless, more Latin American countries have established free-trade agreements with the United States, and in 2004 the United States and Central America signed a free-trade pact. In 2007 the United States was still in the process of negotiating economic agreements with Peru and Colombia.

Association of Southeast Asian Nations (ASEAN)

The Association of Southeast Asian Nations, (ASEAN) was established in August 1967 in Bangkok with the signing of the ASEAN Declaration (Bangkok Declaration) by the Founding Fathers of ASEAN, namely Indonesia, Malaysia, Philippines, Singapore and Thailand. Brunei Darussalam then joined in 1984, Vietnam in 1995, Lao PDR and Myanmar in 1997, and Cambodia in 1999, making up what is today the ten Member States of ASEAN.

Principles

The Treaty of Amity and Co-operation in Southeast Asia lays out the following founding principles of ASEAN:

- Mutual respect for the independence, sovereignty, equality, territorial integrity, and national identity of all nations
- The right of every State to lead its national existence free from external interference, subversion or coercion
- Non-interference in the internal affairs of one another
- Settlement of differences or disputes in a peaceful manner
- Renunciation of the threat or use of force
- Effective cooperation among themselves

Member States:

- Brunei Darussalam
- Cambodia
- Indonesia
- Lao PDR
- Malaysia
- Myanmar
- Philippines
- Singapore
- Thailand
- Viet Nam

Structure

The ASEAN Coordinating Council comprises the ASEAN Foreign Ministers and meets at least twice a year. The ASEAN Community Councils comprises Councils from all three pillars, namely the ASEAN Political-Security Community, the ASEAN Economic Community and the ASEAN Socio-Cultural Community. Under their purview are the relevant ASEAN Sectoral Ministerial Bodies. Each Member State appoints a Permanent Representative to ASEAN based in Jakarta. The Permanent Representatives collectively constitute a Committee of Permanent Representatives. The ASEAN structure also includes National Secretariats and Committees Abroad.

The ASEAN Declaration states that the aims and purposes of the Association are:

to accelerate the economic growth, social progress and cultural development in the region through joint endeavours in the spirit of equality and partnership to promote regional peace and stability through abiding respect for justice and the rule of law in the relationship among countries in the region and adherence to the principles of the United Nations Charter

Regional Integration

The ASEAN Economic Community (AEC) is the goal of regional economic integration. AEC envisages the following key characteristics:

- a single market and production base
- a highly competitive economic region
- a region of equitable economic development
- a region fully integrated into the global economy

The AEC calls for the free flow of skilled labour while low and semi-skilled labour migration in ASEAN is managed by national policies and bilateral agreements.

The AEC will transform ASEAN into a region with freer movement of goods, services, investment, skilled labour, and capital. It is expected that people within the ASEAN region will move in response to the new economic opportunities created by the AEC. All ASEAN Member States signed in 2007 the ASEAN Declaration on the Protection and Promotion of the Rights of Migrant Workers. The Declaration states that Member States must promote fair and appropriate employment protection and adequate access to decent working and living conditions for migrant workers. By 2020, Member States should come to an agreement on the ASEAN Framework Instrument on the protection and promotion of the rights of migrant workers.

Figure: 3.1 Asean Association of Southeast Asian Nation



Source- Google Image

North American Free Trade Agreement (NAFTA)

The North American Free Trade Agreement (NAFTA), which was enacted in 1994 and created a free trade zone for Mexico, Canada, and the United States, is the most important feature of the U.S.-Mexico bilateral commercial relationship. As of January 1, 2008, all tariffs and quotas were eliminated on U.S. exports to Mexico and Canada under the North American Free Trade Agreement (NAFTA).

Mexico is the United States' third-largest trading partner and second-largest export market for U.S. products. In 2018, Mexico was our third-largest trading partner (after Canada and China) and second-largest export market. Two-way trade in goods and services totalled USD 678 billion, and this trade directly and indirectly supports millions of U.S. jobs. The United States sold USD 265 billion of U.S. products to Mexico in 2018 and USD 34 billion in services, for a total of USD 299 billion in U.S. sales to Mexico. Mexico is the first or second-largest export destination for 27 U.S. states.

Figure: 3.2 North American Free Trade Agreement (NAFTA)



Source- Google Image

NAFTA provides coverage to services except for aviation transport, maritime, and basic telecommunications. The agreement also provides intellectual property rights protection in a variety of areas including patent, trademark, and copyrighted material. The government procurement provisions of the NAFTA apply not only to goods but also to contracts for services and construction at the federal level. Additionally, U.S. investors are guaranteed equal treatment to domestic investors in Mexico and Canada.

NAFTA allows your company to ship qualifying goods to customers in Canada and Mexico duty-free. Goods can qualify in several ways under NAFTA's rules of origin. This might be due to the products being wholly obtained or produced in a NAFTA party or because according to the product's rule of origin, there is a sufficient amount of work and materials required in a NAFTA party to make the product become what it is when it is exported.

World Trade Organization(WTO)

World Trade Organization (WTO) is an international organization established to supervise and liberalize world trade. The WTO is the successor to the General Agreement on Tariffs and Trade (GATT), which was created in 1947 with the expectation that it would soon be

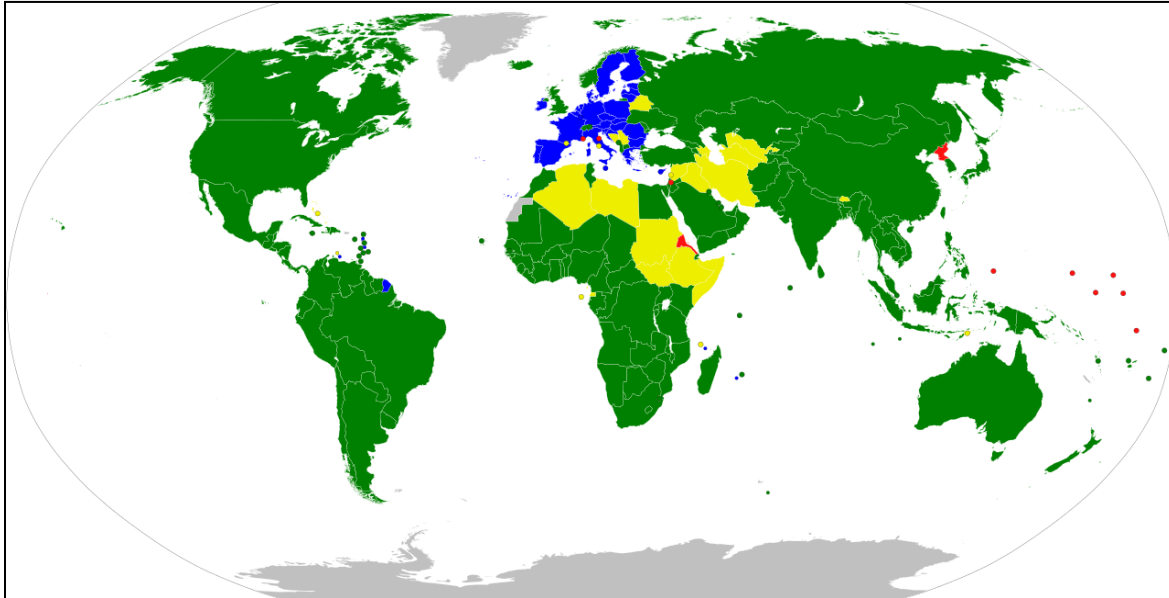
replaced by a specialized agency of the United Nations (UN) to be called the International Trade Organization (ITO). Although the ITO never materialized, the GATT proved remarkably successful in liberalizing world trade over the next five decades. By the late 1980s, there were calls for a stronger multilateral organization to monitor trade and resolve trade disputes. Following the completion of the Uruguay Round (1986–94) of multilateral trade negotiations, the WTO began operations on January 1, 1995.

The ITO was initially envisaged, along with the International Monetary Fund (IMF) and the World Bank, as one of the key pillars of post-World War II reconstruction and economic development. In Havana in 1948, the UN Conference on Trade and Employment concluded a draft charter for the ITO, known as the Havana Charter, which would have created extensive rules governing trade, investment, services, and business and employment practices. However, the United States failed to ratify the agreement. Meanwhile, an agreement to phase out the use of import quotas and to reduce tariffs on merchandise trade, negotiated by 23 countries in Geneva in 1947, came into force as the GATT on January 1, 1948.

Although the GATT was expected to be provisional, it was the only major agreement governing international trade until the creation of the WTO. The GATT system evolved over 47 years to become a de facto global trade organization that eventually involved approximately 130 countries. Through various negotiating rounds, the GATT was extended or modified by numerous supplementary codes and arrangements, interpretations, waivers, reports by disputesettlement panels, and decisions of its council.

During negotiations ending in 1994, the original GATT and all changes to it introduced before the Uruguay Round were renamed GATT 1947. This set of agreements was distinguished from GATT 1994, which comprises the modifications and clarifications negotiated during the Uruguay Round (referred to as “Understandings”) plus a dozen other multilateral agreements on merchandise trade. GATT 1994 became an integral part of the agreement that established the WTO. Other core components include the General Agreement on Trade in Services (GATS), which attempted to supervise and liberalize trade; the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which sought to improve protection of intellectual property across borders; the Understanding on Rules and Procedures Governing the Settlement of Disputes, which established rules for resolving conflicts between members; the Trade Policy Review Mechanism, which documented national trade policies and assessed their conformity with WTO rules; and four plurilateral agreements, signed by only a subset of the WTO membership, on civil aircraft, government procurement, dairy products, and bovine meat (though the latter two were terminated at the end of 1997 with the creation of related WTO committees). These agreements were signed in Marrakech, Morocco, in April 1994, and, following their ratification, the contracting parties to the GATT treaty became charter members of the WTO. By the 2020s the WTO had more than 160 members.

Figure: 3.3 World Trade Organization (WTO)



Source- Google Image

African Union (AU)

African Union (AU) is an intergovernmental organization, established in 2002, to promote unity and solidarity of African states, to spur economic development, and to promote international cooperation. The African Union (AU) replaced the Organization of African Unity (OAU). The AU's headquarters are in Addis Ababa, Ethiopia.

The OAU was established on May 25, 1963, and its activities included diplomacy (especially in support of African liberation movements), mediation of boundary conflicts and regional and civil wars, and research in economics and communications. The OAU maintained the "Africa group" at the United Nations (UN) through which many of its efforts at international coordination were channelled. The OAU was instrumental in bringing about the cooperation of African states in the work of the Group of 77, which acts as a caucus of developing nations within the UN Conference on Trade and Development.

The principal organ of the OAU was the annual assembly of heads of state and government. Between these summit conferences, policy decisions were in the hands of a council of ministers, composed of foreign ministers of member states.

Figure: 3.4 African Union (AU)



Source- Map by Evan Centanni, from blank map by Eric Gaba. License: CC BY-SA

The major practical achievements of the OAU were mediations in several border disputes, including those of Algeria and Morocco (1963–64) and Kenya and Somalia (1965–67). It monitored events in South Africa and advocated international economic sanctions against that country as long as the official policy of apartheid was in place. In 1993 the OAU created a mechanism to engage in peacemaking and peacekeeping on the continent. In 1998 the OAU sponsored an international panel headed by former Botswanan president Ketumile Masire to investigate the genocide that took place in Rwanda in 1994; its report was released in 2000.

Also in 2000, in a move spearheaded by Libyan leader Colonel Muammar al-Qaddafi, it was proposed that the OAU be replaced by a new body, the African Union. The African Union was to be more economic, similar to the European Union, and would contain a central bank, a court of justice, and an all-Africa parliament. A Constitutive Act, which provided for the establishment of the African Union, was ratified by two-thirds of the OAU's members and came into force on May 26, 2001. After a transition period, the African Union replaced the OAU in

July 2002. In 2004 the AU's Pan-African Parliament was inaugurated, and the organization agreed to create a peacekeeping force, the African Standby Force, of about 15,000 soldiers.

Asia-Pacific Economic Cooperation (APEC)

Asia-Pacific Economic Cooperation (APEC) is an organization that seeks to promote free trade and economic cooperation throughout the Asia-Pacific region. Established in 1989 in response to the growing interdependence of Asia-Pacific economies and the advent of regional economic blocs (such as the European Union and the North American Free Trade Area) in other parts of the world, APEC works to raise living standards and education levels through sustainable economic growth and to foster a sense of community and an appreciation of shared interests among Asia-Pacific countries. At the end of the 1990s APEC's membership included its 12 founding members—Australia, Brunei, Canada, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and the United States—as well as Chile, China, Hong Kong, Mexico, Papua New Guinea, Peru, Russia, Taiwan, and Vietnam. The Pacific Economic Cooperation Council (PECC), the South Pacific Forum (SPF), and the secretariat of the Association of Southeast Asian Nations (ASEAN) maintain observer status.

Figure: 3.5 Asia-Pacific Economic Cooperation (APEC)



Source – Google Map

At its 1994 summit meeting, APEC set an ambitious goal of achieving a free trade and investment regime in the Asia-Pacific region by 2010 for members with developed economies and by 2020 for members with developing ones. The following year it adopted the Osaka Action Agenda, a plan to implement APEC's goals of liberalizing trade and investment, facilitating business activities, and promoting economic and technical cooperation. Despite these commitments, APEC's effectiveness has been limited by its requirement that all its decisions be made by consensus. Although APEC seeks unanimity, decisions can be taken in the absence of unanimity; however, decisions are not legally binding on member governments.

APEC is organized into numerous committees, ad hoc policy groups, working groups, and a business advisory council. The committees, which examine issues such as trade and investment, economic trends, and budgetary matters, meet twice per year. The working groups are headed by experts and consider specific issues, including energy, tourism, fishing, transportation, and telecommunications. The organization's chair, which rotates annually, hosts an annual summit meeting and meetings of foreign and economic ministers and other senior officials. The APEC Secretariat, established in 1993 and headquartered in Singapore, provides advisory and logistic services as well as research and analysis.

Southern African Development Community (SADC)

Southern African Development Community (SADC) is, a regional organization of southern African countries that works to promote economic cooperation and integration among the member states and to preserve their economic independence. The member states are Angola, Botswana, Comoros, Eswatini, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe.

The first conference was held in 1979, on the eve of Zimbabwe's (Rhodesia's) independence under black majority rule. The SADC's activities are coordinated at annual conferences of the heads of government and of a council of ministers from all the member states. The SADC plans, coordinates, and finances various projects in agriculture and animal husbandry, energy, mining, disease control, telecommunications, and regional trade.

Among the SADC's earliest priorities were projects to improve the existing rail and road networks between the member states so they could reduce their dependence on South African ports and transport routes for the shipment of their imports and exports. These projects greatly improved the region's transportation infrastructure. With the advent of majority black rule in South Africa and that country's membership in the SADC (1994), however, the focus of the organization shifted toward greater regional economic integration.

Figure: 3.6 Southern African Development Community (SADC)



Source- Google Image

3.4 SUMMARY

Trade & Development Regionalization refers to the process of countries or regions coming together to form economic partnerships and agreements aimed at promoting trade, investment, and economic development within a specific geographic area. This phenomenon has gained momentum in recent decades as countries recognize the potential benefits of regional integration for stimulating economic growth, reducing poverty, and enhancing competitiveness in the global marketplace.

The process of Trade & Development Regionalization involves the establishment of various forms of regional economic integration, such as preferential trade agreements, customs unions, common markets, and economic zones. These initiatives aim to foster closer economic ties and cooperation among neighbouring countries or regions by pooling resources, sharing infrastructure, and harmonizing trade policies and regulations.

The drivers of Trade & Development Regionalization include economic factors such as market access, economies of scale, and resource complementarity, as well as political, social, and strategic considerations. Countries and regions are motivated to pursue regional integration to capitalize on opportunities offered by globalization, enhance national security, promote regional stability, and address common challenges.

The impacts of Trade & Development Regionalization are multifaceted and include economic, social, environmental, and political dimensions. Regional integration initiatives can lead to increased trade flows, investment, and GDP growth, as well as employment creation, poverty reduction, and income distribution. However, they also present challenges, including disparities in economic development, regulatory barriers, infrastructural constraints, and geopolitical tensions.

3.5 GLOSSARY

- **Regionalization:** The process of organizing economic, political, and social activities on a regional scale, often involving cooperation and integration among neighbouring countries or territories.
- **Free Trade Agreement (FTA):** An agreement between two or more countries to eliminate tariffs and other barriers to trade on goods and services traded between them.
- **Customs Union:** A form of trade agreement in which member countries agree to eliminate tariffs and adopt a common external tariff on goods imported from non-member countries, while also allowing for the free movement of goods within the union.
- **Common Market:** A type of trade bloc in which member countries not only eliminate tariffs and adopt a common external tariff but also allow for the free movement of factors of production, such as labour and capital, among member countries.
- **Economic Integration:** The process by which countries in a region cooperate and coordinate their economic policies to reduce barriers to trade and investment, leading to deeper levels of economic cooperation and integration.
- **Regional Trade Bloc:** A group of countries within a specific geographic region that have implemented some form of trade agreement or economic integration scheme to facilitate trade and economic cooperation among member countries.
- **Preferential Trade Agreement (PTA):** A trade agreement that reduces tariffs and other barriers to trade between participating countries, but typically to a lesser extent than a free trade agreement.
- **Regional Development:** The promotion of economic growth, social progress, and environmental sustainability within a specific geographic region, often through targeted policies and investments aimed at addressing disparities in income, infrastructure, and access to basic services.

3.6 ANSWER TO THE CHECK YOUR PROGRESS

1. Which of the following is NOT a form of regional trade agreement?

- A) Free Trade Agreement (FTA)
- B) Customs Union
- C) Bilateral Investment Treaty (BIT)
- D) Common Market

Answer: C) Bilateral Investment Treaty (BIT)

2. What is the main objective of a Customs Union?

- A) To eliminate tariffs between member countries
- B) To adopt a common external tariff on goods imported from non-member countries
- C) To allow for the free movement of goods within the union
- D) All of the above

Answer: D) All of the above

3. What is the purpose of trade facilitation measures?

- A) To increase tariffs on imported goods
- B) To impose restrictions on international trade
- C) To simplify and streamline international trade procedures
- D) To promote economic isolationism

Answer: C) To simplify and streamline international trade procedures

4. Which term refers to the process of reducing or eliminating restrictions on international trade?

- A) Trade Facilitation
- B) Economic Integration
- C) Trade Liberalization
- D) Preferential Trade Agreement (PTA)

Answer: C) Trade Liberalization

5. What are Rules of Origin used for in international trade?

- A) To determine the quality of imported goods
- B) To establish quotas on certain products
- C) To calculate the value-added tax (VAT) on exports
- D) To determine the country of origin of a product for trade purposes

Answer: D) To determine the country of origin of a product for trade purposes

6. Which term refers to the promotion of economic growth, social progress, and environmental sustainability within a specific geographic region?

- A) Trade Facilitation
- B) Economic Diversification
- C) Regional Development
- D) Non-Tariff Barrier (NTB)

Answer: C) Regional Development

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- <https://www.britannica.com/topic/Asia-Pacific-Economic-Cooperation>
- <https://www.britannica.com/topic/Southern-African-Development-Community>

3.8 TERMINAL QUESTIONS

1. What are the main objectives of trade and development regionalization?
2. How do regional trade agreements contribute to trade and development regionalization?
3. What role does infrastructure development play in promoting regional trade and development?
4. What are some examples of successful trade and development regionalization initiatives?
5. How do trade facilitation measures enhance regional trade integration?
6. What challenges do countries face in implementing trade and development regionalization policies?
7. How does trade and development regionalization impact economic growth and poverty reduction?
8. What are the potential benefits of joint investment initiatives in promoting regional development?
9. How does regional cooperation contribute to addressing transnational challenges, such as climate change and pandemics?
10. What strategies can countries adopt to maximize the benefits of trade and development regionalization while minimizing potential risks and drawbacks?

BLOCK-2 REGIONS OF THE WORLD

UNIT 4- PHYSICAL & CLIMATIC REGIONS

4.2 INTRODUCTION

4.1 OBJECTIVES

4.3 TROPICAL REGIONS

4.4 WARM TEMPERATURE REGIONS

4.5 COLD TEMPERATURE REGIONS

4.6 COLD REGIONS

4.7 SUMMARY

4.8 GLOSSARY

4.9 ANSWER TO THE CHECK YOUR PROGRESS

4.10 REFERENCES

4.11 TERMINAL QUESTIONS

4.1 OBJECTIVES

After reading this unit, you will be able to:

- Understand the major world's physical and climatic regions.
- Learn about the tropical regions, warm, temperate regions, cold temperate regions and cold regions.
- Gain knowledge about the climatic, soils, vegetation and Animal life of the major world's physical and climatic regions.

4.2 INTRODUCTION

A branch of geography called "world regional geography" is devoted to the examination of the spatial relationships, patterns, and traits of different parts of the world. It aims to comprehend and examine the variety of global environments, economies, cultures, and human-environment interactions. This field offers a thorough framework for delving into the nuances of regional variations, looking at the human and physical elements that distinguish different geographical areas.

First of all British geographer A. J. Herbertson 1990 divided the world into 15 major natural regions based on natural vegetation. Several Geographers have considered climate to be the most important element of the natural regionalization of the world. Based on climate, Finch and Trevartha have divided the whole world into 12 major natural regions. Differences may be found in the number and extent of natural regions decided by different geographers. Following the scheme adopted by Herbertson with nominal modification, a general classification of natural regions of the world has been discussed here. Major natural regions of the world are as follows:

Regional geography is a subdivision of geography that focuses on the study of regions and emphasizes the spatial relationships and characteristics of certain land and surface areas. It involves the study of the physical, cultural, economic and environmental characteristics that define and distinguish a region from others. The goal is to understand the complexity of human-environment interaction in a certain geographic context.

A. Tropical Regions:

1. Equatorial regions
2. Savanna regions or Sudan-type regions
3. Tropical monsoon regions
4. Tropical deserts or Sahara-type regions

B. Warm Temperate Regions

5. Mediterranean regions
6. Temperate desert regions
7. China-type regions

C. Cold Temperate Regions

8. Prairie- type regions
9. West-European type regions
10. St. Lawrence-type regions

D. Cold Regions

11. Taiga-type regions
12. Tundra-type regions
13. High Mountain regions

4.3 TROPICAL REGIONS

Tropical regions, situated between the Tropic of Cancer and the Tropic of Capricorn, constitute a diverse and ecologically rich band around the Earth's equator. Characterized by warm temperatures, high humidity, and an absence of distinct seasons, these regions play a pivotal role in shaping global climate patterns and host some of the planet's most biodiverse ecosystems. The Amazon Rainforest, often referred to as the "lungs of the Earth," covers vast areas in South America and is renowned for its unparalleled biodiversity. The Congo Basin in Africa, housing the second-largest tropical rainforest, is another critical hotspot for diverse flora and fauna. Southeast Asia boasts tropical rainforests, including the lush forests of Borneo and

Sumatra. These regions are home to iconic species such as jaguars, orangutans, and a myriad of plant species, many of which are yet to be discovered.

Tropical climates support unique ecosystems like savannas, mangrove forests, and coral reefs. The Great Barrier Reef in Australia, the world's largest coral reef system, is emblematic of the diverse marine life found in tropical waters. The intricate relationship between climate, geography, and biodiversity in tropical regions is explored in ecological studies, emphasizing the need for conservation efforts to protect these fragile ecosystems from threats such as deforestation, climate change, and habitat degradation.

EQUATORIAL REGIONS

Location and Extent

Equatorial regions extend between 10°N and 10°S latitudes on both sides of the equator. Their maximum extent is found in the northern part of South America, West Central part of Africa and the islands of South East Asia. The maximum development of such regions has taken place in the Amazon Basin in South America, the Congo Basin in Africa, and the Indo-Malaysian Region (mainly in Java, Sumatra, Borneo, Malaysia and New Guinea) in Asia.

Equatorial regions, encircling the Earth near the equator, are characterized by unique climatic and ecological features that distinguish them from other geographical zones. Spanning countries in Central and West Africa, parts of South America, Southeast Asia, and some islands in the Pacific and Indian Oceans, equatorial regions experience consistent temperatures throughout the year, with minimal temperature variations between day and night. These areas receive abundant sunlight, leading to high levels of precipitation and the development of lush rainforests. The Amazon Rainforest in South America, the Congo Basin in Africa, and parts of Indonesia exemplify the unparalleled biodiversity found in equatorial rainforests. These regions are home to a plethora of plant and animal species, many of which are endemic and contribute significantly to global biodiversity.

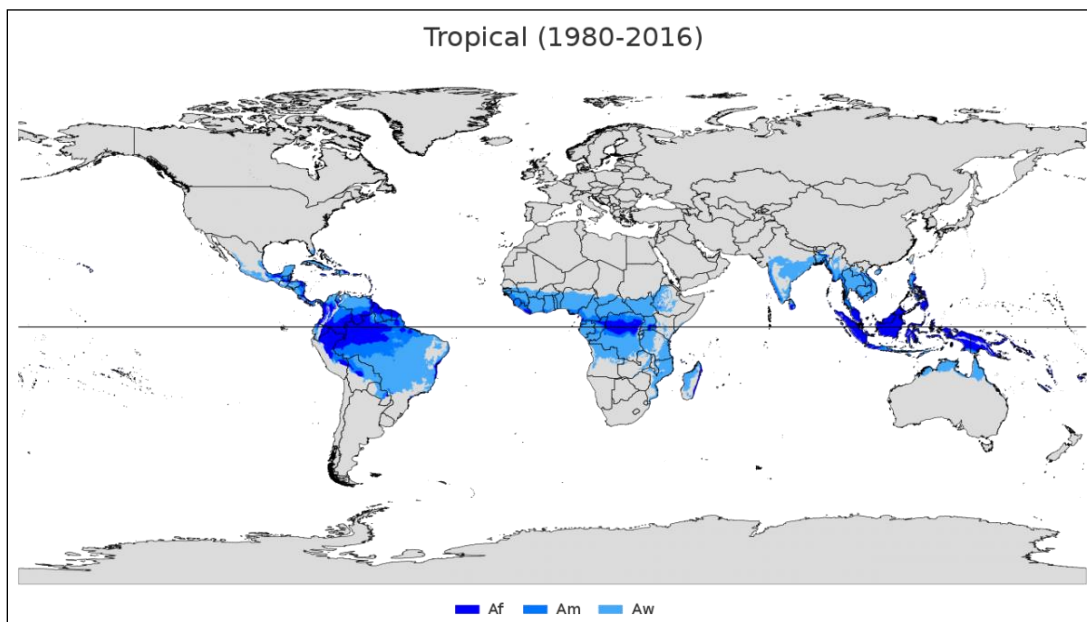
The equatorial climate fosters the growth of diverse vegetation, including towering trees, epiphytes, and a myriad of plant species adapted to the constant warmth and humidity. This rich biodiversity is critical for the planet's ecological balance and carbon sequestration. Moreover, equatorial regions host indigenous communities whose cultures are intricately linked to the

surrounding natural environment. However, these regions face challenges such as deforestation, habitat loss, and the impacts of climate change, threatening the delicate balance of these ecosystems.

Climate

The location of a place gives insights into the climate of that region. Considering this, can you now analyze the climatic conditions prevalent in the equatorial region? As the name suggests, this region is located near the equator. You might have read in the school that the sun's rays fall perpendicular/straight throughout the year in the equatorial region. Therefore, it is characterized by high sunshine throughout the year. The high sunshine leads to high temperatures throughout the year. This is the reason for which, the region does not have the presence of winters. The seasonal and diurnal variation in temperature is not considerable. Temperatures are uniform throughout the year. The mean monthly and mean annual temperature of the region is close to 27° C. The mornings in the region are bright and sunny.

Figure: 4.1 EQUATORIAL REGIONS



Source: Köppen–Geiger climate classification map for Tropical - source: wikicommons, authors: Beck, H.E., Zimmermann, N. E., McVicar, T. R., Vergopolan, N., Berg, A., & Wood, E. F., 2018

Equatorial regions exhibit a distinct and consistent climate characterized by high temperatures, abundant rainfall, and minimal temperature variations throughout the year. Located near the Earth's equator, these regions experience direct sunlight year-round, resulting in warm temperatures that rarely deviate from an average. The equatorial climate is typified by high humidity and heavy rainfall, fostering the development of lush rainforests. Annual precipitation levels often exceed 2,000 millimetres, contributing to the incredible biodiversity of equatorial regions. These areas are crucial for maintaining global climate stability, as the high temperatures and abundant vegetation promote significant evaporation and transpiration, influencing atmospheric circulation patterns.

Soil

Equatorial regions are characterized by diverse and often nutrient-rich soils, influenced by the prevailing climatic conditions and the lush vegetation that thrives in these areas. The continuous warmth and high rainfall contribute to the rapid decomposition of organic matter, creating a thick layer of humus on the forest floor. These soils are commonly known as Ferralsols or Acrisols, and they exhibit a reddish or yellowish colour due to the accumulation of iron and aluminium oxides. The mineral content of equatorial soils can vary, but they generally possess good fertility, supporting the remarkable biodiversity observed in tropical rainforests. However, despite their fertility, equatorial soils are susceptible to leaching due to heavy rainfall, leading to the loss of nutrients. Additionally, human activities such as deforestation and agriculture can impact soil structure and fertility, posing challenges to sustainable land use in equatorial regions.

Vegetation

Figure: 4.2 Equatorial region forest

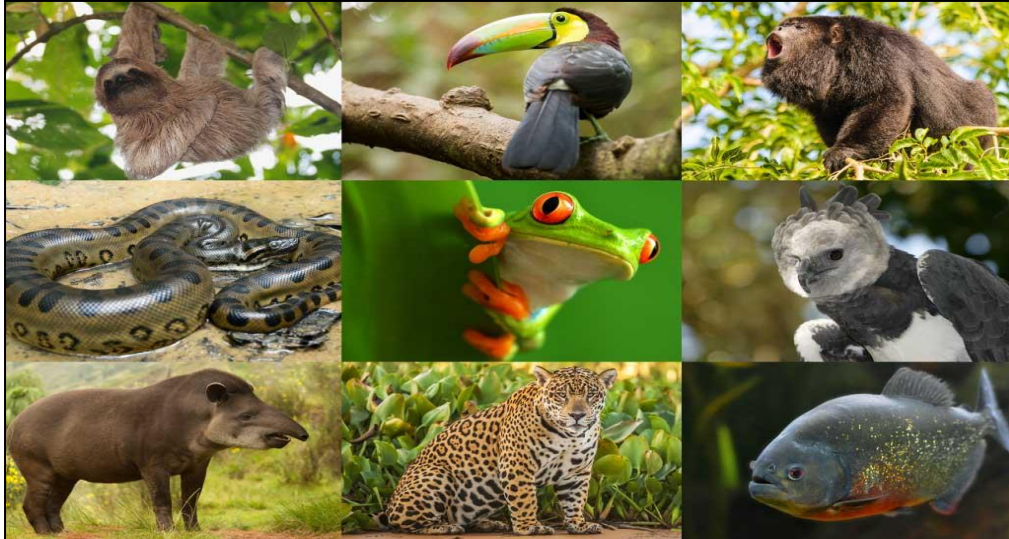


Source: Google Image

Equatorial regions boast some of the most diverse and luxuriant vegetation on the planet, largely due to the consistent warm temperatures, high humidity, and abundant rainfall throughout the year. The dominant vegetation type in equatorial regions is tropical rainforest, characterized by a dense canopy of broad-leaved evergreen trees that form a multi-layered ecosystem. These rainforests are home to an extraordinary array of plant species, including towering hardwoods, epiphytes, lianas, and numerous understory plants. Notable examples include the Amazon Rainforest in South America, the Congo Basin in Africa, and the rainforests of Southeast Asia. The equatorial climate, with its uniform photoperiod and minimal temperature fluctuations, fosters continuous plant growth and high rates of photosynthesis. The incredible biodiversity of equatorial vegetation provides habitat for a vast number of animal species, making these regions vital for global ecological balance.

Animal

Figure: 4.3 The animals of the tropical evergreen rainforest



Source: Source- Google image

Equatorial regions host an incredibly diverse and vibrant array of animal life, making them one of the most ecologically rich areas on Earth. The lush tropical rainforests of the Amazon, Congo, and Southeast Asia are particularly renowned for their unparalleled biodiversity. In these regions, an astonishing variety of species, from insects and amphibians to mammals and birds, thrive in the complex ecosystems. The Amazon Rainforest, for example, is home to iconic species such as jaguars, harpy eagles, poison dart frogs, and an incredible diversity of primates, including capuchins and howler monkeys. The Congo Basin houses diverse wildlife, including forest elephants, western lowland gorillas, and a plethora of bird species. Southeast Asia's rainforests harbour unique creatures such as orangutans, Sumatran tigers, and a vast array of reptiles and amphibians.

However, the biodiversity of equatorial animal kingdoms is increasingly under threat due to habitat destruction, deforestation, and climate change. Conservation efforts are crucial to preserving these unique ecosystems and the myriad species that call them home.

SAVANNA REGIONS OR SUDAN-TYPE REGIONS

Location and Extent

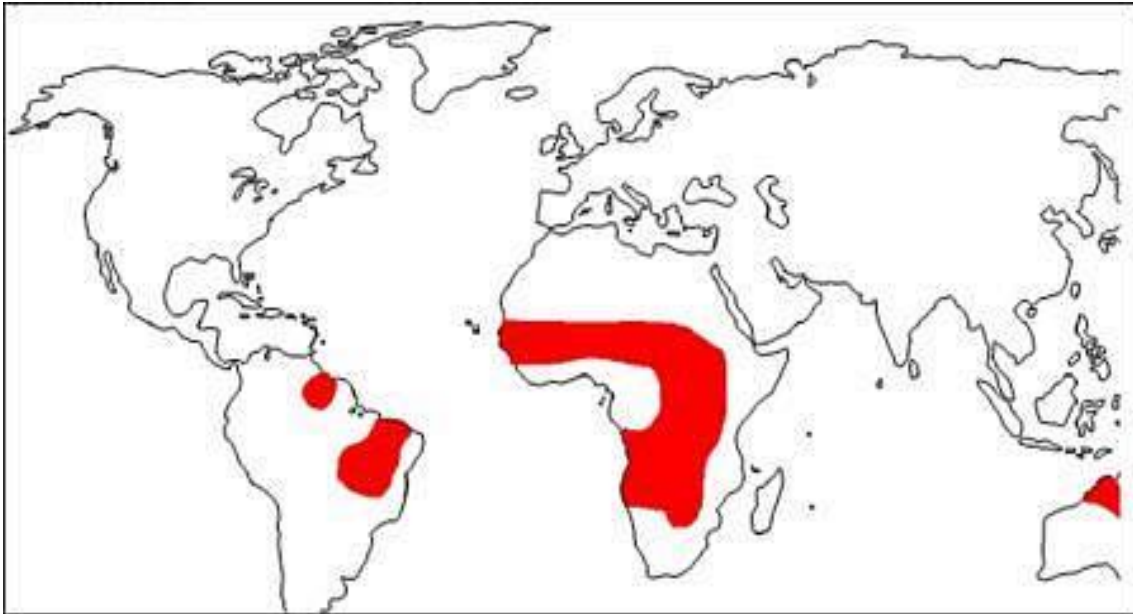
The word Savanna has been used to indicate to tropical wet and dry climate. The Savanna region extends in both hemispheres between 10 and 20 latitudes. It includes Llanos of Columbia and Venezuela, Campos of South Central Brazil and Granchaco (Bolivia) in South America, hilly areas of Central America, and the Savanna region in Central and East Africa. The maximum extent of the Savanna region is found in Sudan. So that this type of region is also known as a Sudan-type region. In Africa, the Savannas extend in a crescent-shaped belt encircling the tropical evergreen rain forests and include Guinea coastal countries, Sudan, Kenya, Ethiopia, Tanzania, Zimbabwe, Mozambique and Malagassi. Physical Conditions

Savanna regions, also known as Sudan-type regions, are characterized by a distinct ecological landscape that features a mix of grasslands and scattered trees. These regions are typically found in tropical and subtropical climates, lying between tropical rainforests and arid deserts. The climate in savannas is marked by a distinct wet and dry season, with prolonged periods of drought alternating with heavy rainfall. The vegetation consists of a mix of grasses and savanna woodlands, with trees like acacias and baobabs adapted to withstand the dry conditions. Savannas are known for their biodiversity, supporting a variety of wildlife, including large herbivores like elephants, zebras, and giraffes, as well as predators like lions and cheetahs.

Climate

In general, savannas grow in tropical regions 8° to 20° from the Equator. Conditions are warm to hot in all seasons, but significant rainfall occurs for only a few months each year—about October to March in the Southern Hemisphere and April to September in the Northern Hemisphere. Mean annual precipitation is generally 80 to 150 cm (31 to 59 inches), although in some central continental locations, it may be as low as 50 cm (20 inches). The dry season is typically longer than the wet season, but it varies considerably, from 2 to 11 months. Mean monthly temperatures are about 10 to 20 °C (50 to 68 °F) in the dry season and 20 to 30 °C (68 to 86 °F) in the wet season.

Figure: 4.4 Savanna regions or Sudan-type regions



Source: Google

Savanna regions, characterized by a distinct mix of grasslands and scattered trees, exhibit a tropical or subtropical climate with a well-defined wet and dry season. The climate is marked by a pronounced alternation between periods of rainfall and drought. During the wet season, which typically coincides with the summer months, savannas experience heavy and regular rainfall, promoting lush vegetation growth. In contrast, the dry season sees reduced precipitation, leading to water scarcity and the drying out of the landscape. This climate pattern is influenced by factors such as the Intertropical Convergence Zone (ITCZ), which shifts seasonally, and the presence of trade winds. The alternating wet and dry conditions contribute to the unique vegetation structure of savannas, with grasses dominating during the wet season and deciduous trees and shrubs adapted to the drier periods. The variability in precipitation and temperature in savanna climates influences the distribution of both plant and animal species, creating a diverse and dynamic ecosystem.

Soils

Savanna regions exhibit a variety of soils influenced by their unique climate, vegetation, and geomorphological characteristics. The soils in savannas are often classified as tropical soils, and they vary widely depending on factors such as drainage, topography, and parent material.

Ferralsols and Acrisols are common soil types found in savanna regions, characterized by a reddish or yellowish colour due to the accumulation of iron and aluminium oxides. The extensive grass cover in savannas contributes organic matter to the soil, forming a layer of humus. However, the nutrient content of savanna soils can be relatively low, especially during the dry season when leaching is prevalent. Human activities, such as agriculture and grazing, can impact soil fertility and structure, leading to challenges in sustainable land use. Understanding the complex interactions between climate, vegetation, and soil in savanna regions is crucial for managing these ecosystems and addressing issues related to land degradation and biodiversity conservation.

Vegetation

Savanna regions are characterized by a distinctive blend of vegetation, featuring a mix of grasses and scattered trees. This unique landscape is adapted to a tropical or subtropical climate with a distinct wet and dry season. During the wet season, the savanna bursts into life with lush grasses dominating the landscape, creating an expansive sea of green. The scattered trees, often species like acacias or baobabs, are well-adapted to the challenging conditions of the savanna, including the prolonged dry season and occasional wildfires.

Figure: 4.5 Savanna regions Vegetation & Wildlife



Source: Google Image

Animal

Savanna regions are renowned for their diverse and iconic array of wildlife, adapted to the dynamic interplay between grasslands and scattered trees. This unique ecosystem supports a variety of herbivores, including large mammals such as elephants, giraffes, zebras, and various species of antelope. These herbivores, in turn, attract a diverse range of predators, including lions, cheetahs, leopards, and hyenas. Birds are also prolific in savannas, with numerous species of raptors, vultures, and ground-nesting birds taking advantage of the open landscape. The seasonal nature of savanna climates, with alternating wet and dry periods, influences the migration patterns and behaviours of many species. For instance, the Wildebeest migration in the Serengeti involves vast herds moving across the plains in search of fresh grazing areas. The coexistence and interactions between these herbivores and predators in savanna ecosystems contribute to the biodiversity and ecological balance of these regions.

TROPICAL MONSOON REGIONS

Location and extent

These regions are located in the eastern parts of the continents between 8° and 30° latitude in the Northern and Southern Hemispheres. Therefore, they are subject to southerly winds in the tropical zone.

These territories include (i) India, Burma (Myanmar), Pakistan, Bangladesh, Sri Lanka, Thailand, Vietnam, Kampuchea (Cambodia), Laos, Southern China and Taiwan (Formosa) in Asia; (ii) Florida and Mexico and Western Islands in North America; (iii) West Coast and Panama coastal areas in Central America; (iv) Colombia and northern Venezuela in South America and the eastern coast of Brazil; (v) Coastal part of East Africa, Mozambique and Malagasy Islands in Africa; And (vi) includes the northern coastal part of Australia and the central southern part of New Guinea. This climate has developed ideally in Southern Asia.

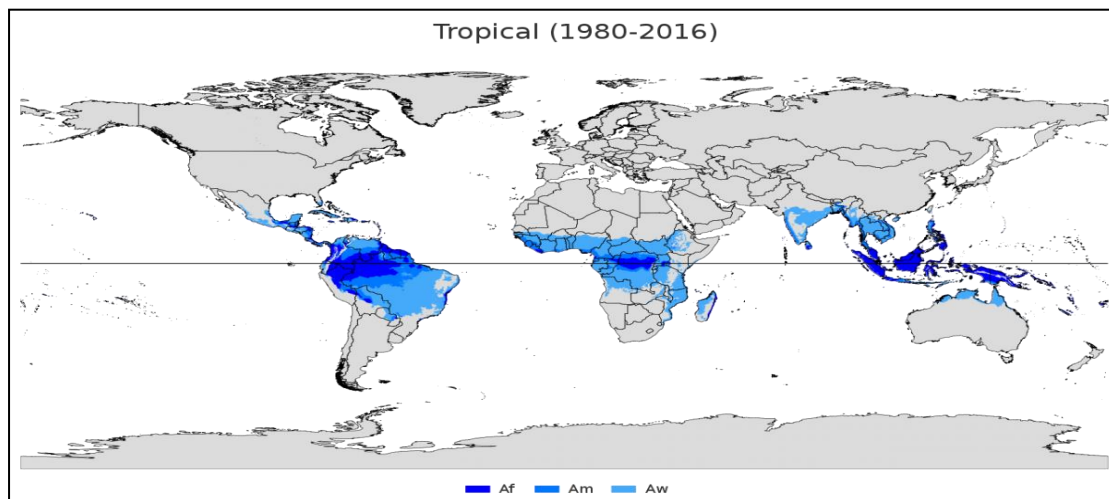
Tropical monsoon regions are characterized by distinctive seasonal changes in precipitation and temperature, driven by the reversal of prevailing wind patterns. These regions experience a pronounced wet season, known as the monsoon season, followed by a drier period.

The shift in wind direction brings heavy rains during the wet season, fostering lush vegetation and supporting agricultural activities. Conversely, the dry season is characterized by reduced precipitation, which can lead to water scarcity and drought conditions. Notable examples of tropical monsoon regions include parts of Southeast Asia, India, northern Australia, and portions of Africa. The Indian subcontinent, in particular, experiences a well-defined monsoon, influencing its climate and shaping the livelihoods of millions of people. Understanding the dynamics of tropical monsoon climates is crucial for agriculture, water resource management, and ecosystem stability in these regions.

Climate

In hot monsoon regions, the winter season is generally hot and humid and the winter season is generally cool and dry. The annual and daily temperature range is not much here. Here the average temperature of the spring season ranges from 27°C to 35°C and that of the winter season ranges from 18°C to 22°C. These parts fall in the path of southerly winds and the winter season in these parts is usually dry. Therefore, more than 85 percent of the rainfall here occurs in the western season. The amount of rainfall in these regions depends on the direction of the winds blowing from the sea and the extent of the mountains; For example, in India, Cherrapunji receives around 1,100 cm rainfall and the Western Ghats receive around 200 to 400 cm rainfall.

Figure: 4.6 Geiger climate classification map for Tropical



Source: Köppen–Geiger climate classification map for Tropical - source: wikicommons, authors: Beck, H.E., Zimmermann, N. E., McVicar, T. R., Vergopolan, N., Berg, A., & Wood, E. F., 2018

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Soils

Soils in tropical monsoon regions are highly influenced by the alternating wet and dry seasons characteristic of this climate. The intense monsoon rains during the wet season contribute to the leaching of minerals and nutrients from the topsoil, leading to the formation of lateritic soils. Laterites are common in these regions and are characterized by their reddish colour due to the accumulation of iron oxides. These soils are often well-drained but can become compacted during the dry season. Additionally, the wet season encourages the growth of vegetation, contributing organic matter to the soil. However, the leaching process can lead to nutrient depletion in the topsoil, affecting soil fertility. Agricultural practices, including shifting cultivation and terrace farming, are adapted to these soil conditions in tropical monsoon regions. Understanding the unique characteristics of soils in these regions is essential for sustainable land use and effective agricultural management.

Vegetation

Figure: 4.7 Natural vegetation in tropical monsoon regions



Source: Google

The natural vegetation in tropical monsoon regions is characterized by a diverse and lush landscape that adapts to the distinct wet and dry seasons. During the wet season, when monsoon rains are abundant, tropical monsoon regions exhibit dense and evergreen forests, featuring a variety of tree species, shrubs, and undergrowth. These forests are often referred to as tropical rainforests and play a vital role in maintaining biodiversity. The diverse plant species in these ecosystems have developed unique adaptations to the high temperatures, humidity, and intense rainfall. Notable examples include the Western Ghats in India, the Sundarbans mangrove forest in Bangladesh and India, and the tropical rainforests of Southeast Asia. As the dry season ensues, deciduous trees shed their leaves to conserve water, and some regions may experience the emergence of grasslands or savannas. This dynamic interplay between wet and dry seasons shapes the ecological makeup of tropical monsoon regions, influencing the flora and fauna that thrive in these diverse ecosystems.

Animal

Tropical monsoon regions harbor diverse and unique animal communities, adapted to the seasonal changes in precipitation and temperature. The lush vegetation and availability of water during the wet season support a variety of herbivores, including elephants, deer, and various species of primates. In response to the abundance of vegetation, predators such as big cats, including tigers and leopards, thrive in these environments. The wet season is also crucial for the breeding and nesting activities of numerous bird species, contributing to the richness of avian biodiversity. Wetlands and water bodies that form during the monsoon season attract a range of aquatic species, including fish, amphibians, and reptiles. However, the onset of the dry season can lead to challenges such as water scarcity and food shortages, prompting migratory behaviours in some species. The Sundarbans mangrove forest in the tropical monsoon region of Bangladesh and India, for instance, is home to the Bengal tiger and a variety of other wildlife adapted to the unique mangrove ecosystem.

TROPICAL DESERTS OR SAHARA-TYPE REGIONS

Location and Extent

Tropical deserts are almost non-ecumene because of adverse and harsh environments. These deserts are generally situated between 15° and 30° latitudes in both the North and South hemispheres. Dry regions do not lie in well-defined belts as do the temperate and hot-wet regions. They are found in different climates. Tropical deserts embrace particularly extensive areas in continental interiors which are far from sea influence. Such deserts are usually found in the western parts of the continent. The following seven hot deserts are notable in the world:

Tropical deserts, exemplified by the Sahara-type regions, are characterized by arid and hyper-arid climates with extremely low precipitation levels. The Sahara Desert in North Africa is the world's largest hot desert, covering vast expanses with little vegetation. These regions experience high temperatures during the day and can undergo significant temperature fluctuations between day and night due to the lack of cloud cover. The Sahara, for instance, is known for its scorching daytime temperatures and chilly nights. The sparse vegetation consists of drought-resistant plants adapted to arid conditions, including succulents and scattered shrubs. Dunes are a prominent feature of these deserts, shaped by wind action. The unique climate and landscape of Sahara-type regions have implications for biodiversity, human habitation, and the preservation of ancient geological features. Additionally, these regions play a role in global climate dynamics, influencing atmospheric circulation patterns.

Hot Deserts or Sahara-Type Regions

- 1. Chad, Algeria, Tunisia, Libya, Egypt, Ethiopia, Somali Republic and Somaliland.**
- 2. South-West Asian deserts including the entire Arabian Peninsula, southern Israel, Syria, and Iraq.**
- 3. Thar desert in India and Pakistan.**
- 4. Australian desert covers over 40 percent area of Australia,**
- 5. Kalahari desert including Angola, Namibia and Botswana,**
- 6. Atacama desert along the coastal area of Peru and Chile, and**

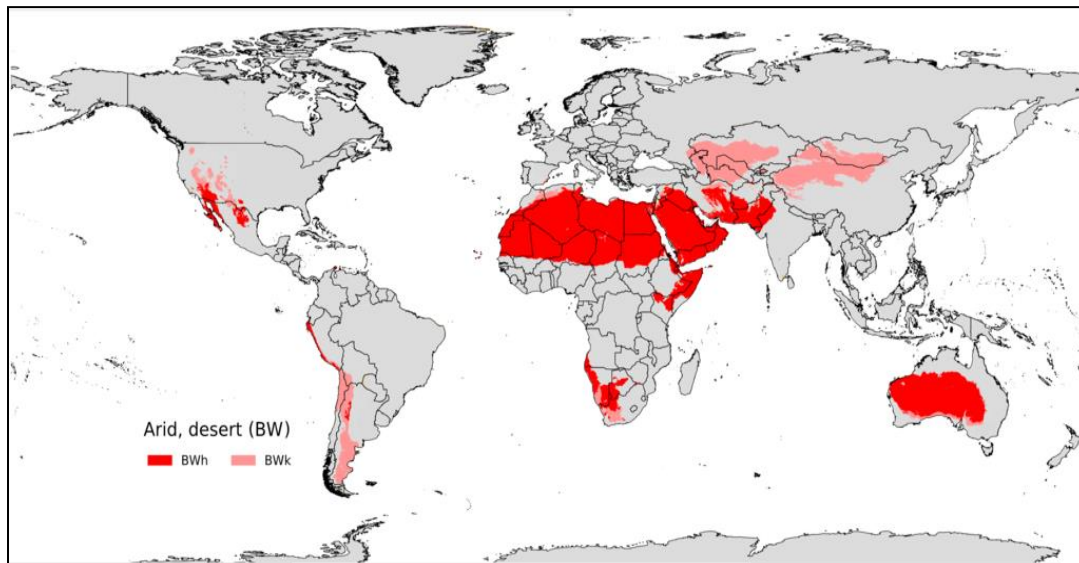
7. Sonora desert covers the area of lower California, Arizona and the northwest coast of Mexico in North America.

Climate

The most important characteristic of the hot desert is its widespread aridity. The scarcity of rainfall is the most significant characteristic of deserts. Most of the deserts experience less than 25 cm. annual rainfall. The climate of the tropical deserts is one of extremes. Here temperatures are recorded highest on the earth while precipitation is the lowest. The average temperature in the time ranges from 30° to 32°C and over, the maximum being 40°-42°C during noon time. Al-Azizia (Libya) in the Sahara desert has recorded the highest temperature of 58°C.

The annual range of temperature remains 10- 15°C. The clear sky at night promotes rapid radiation of heat and diurnal ranges fluctuate between 4°C to 10°C. Frost occurs during the winter season. Except only in certain coastal areas, the air is very dry and relative humidity is extremely low. Dense mists and fogs are common along the desert coasts of the Kalahari and Atacama.

Figure: 4.8 Geiger climate classification map for desert climates



Source: wikicommons, authors: Beck, H.E., Zimmermann, N. E., McVicar, T. R., Vergopolan, N., Berg, A., & Wood, E. F., 2018

Tropical deserts are characterized by their arid climate, marked by low and erratic precipitation levels and high temperatures. These regions, typically situated between the Tropics of Cancer and Capricorn, experience minimal rainfall throughout the year, with some areas receiving less than 250 millimetres annually. The lack of consistent cloud cover allows for intense solar radiation during the day, leading to high daytime temperatures. However, the clear skies also contribute to significant temperature fluctuations, with cooler nights. The Sahara Desert, the largest hot desert in the world, exemplifies the extreme conditions of a tropical desert, with scorching daytime temperatures that can exceed 50 degrees Celsius (122 degrees Fahrenheit). The vegetation in tropical deserts is adapted to conserve water, often consisting of drought-resistant plants such as cacti, succulents, and hardy shrubs. The unique climate of tropical deserts poses challenges for both flora and fauna, and adaptations to water scarcity and temperature extremes are crucial for survival in these harsh environments.

Soils

Tropical desert soils are characterized by unique features shaped by arid conditions and limited vegetation cover. These soils are often classified as aridisols, which are characteristic of arid environments and have limited horizon development. Aridisols in tropical deserts are typically shallow and may have a high mineral content, with the upper layers often composed of sand and silt. The lack of significant vegetation cover hinders organic matter accumulation, making these soils low in fertility. The prevailing arid climate contributes to minimal weathering processes, resulting in relatively unaltered parent material. Additionally, the frequent evaporation of water from the soil surface can lead to the accumulation of salts, resulting in saline soils in some tropical desert areas. The Sahara Desert, for instance, exhibits a variety of soil types, including sandy soils and areas with salt crusts. Understanding the composition and characteristics of tropical desert soils is crucial for sustainable land use practices and addressing challenges related to water retention and soil fertility in these arid environments.

Vegetation

Figure:4.9 Tropical desert vegetation



Source: Google

Tropical deserts are characterized by sparse and specialized vegetation adapted to the extreme arid conditions prevalent in these regions. Plant life in tropical deserts exhibits unique adaptations to conserve water and withstand high temperatures. Xerophytic plants, such as succulents and cacti, are common in tropical deserts, and capable of storing water in their tissues to survive extended periods of drought. Additionally, many plants have developed extensive root systems to tap into deep groundwater reserves. The vegetation is often arranged in a scattered or clumped pattern, reflecting the availability of water and nutrients in localized areas. Some desert plants, like the *Welwitschia mirabilis* found in the Namib Desert, have remarkable longevity and resilience. These adaptations contribute to the ecological balance and biodiversity of tropical desert ecosystems. Despite the harsh conditions, certain flowering plants, shrubs, and small trees manage to thrive, creating pockets of unique flora in these challenging environments.

Animals

Tropical deserts are home to a variety of animals that have adapted to the challenging conditions of arid environments. Many desert animals have evolved specialized physiological and behavioural adaptations to cope with extreme temperatures, water scarcity, and limited vegetation. Nocturnal behaviour is common among desert fauna, allowing them to avoid the intense heat of the day. Examples of iconic desert animals include the Fennec fox, which has large ears for heat dissipation, and the Dromedary camel, known for its ability to endure long periods without water. Reptiles such as the Gila monster and various species of rattlesnakes are well-adapted to the desert's arid conditions. Insects like ants and beetles are also prevalent, with some species exhibiting remarkable water-conserving strategies. Birds, such as the Sandgrouse and Desert Lark, are adapted to extract moisture from their food and can travel long distances in search of water. Despite the apparent harshness of tropical desert environments, these regions support a surprisingly diverse array of life, showcasing the resilience and adaptability of desert fauna.

4.4 WARM TEMPERATE REGIONS

Warm temperate regions are characterized by moderate temperatures, distinct seasons, and a mix of deciduous and evergreen vegetation. These regions are situated between the subtropics and the cool temperate zones, experiencing relatively mild winters and warm summers. The vegetation in warm temperate regions is diverse, with a combination of broadleaf trees, such as oak and maple, and coniferous species like pine and cedar. The seasonal changes, including autumn foliage and spring blossoms, contribute to the visual richness of these areas. Agriculture is often prominent in warm temperate regions due to the favourable climate, supporting the cultivation of a variety of crops. Notable examples of warm temperate regions include parts of the Mediterranean, portions of the United States, and regions in East Asia. Understanding the ecological dynamics and biodiversity of warm temperate regions is essential for conservation efforts and sustainable land management practices.

MEDITERRANEAN REGIONS

Location and Extent

The Mediterranean region extends between 30 degrees and 40 latitudes in both the North and South hemispheres in the western parts of the continents. this region includes The European lands, N.W. African lands and western Asiatic coastal lands bordering the Mediterranean Sea, Central and Southern California of the United States, Central Chile of South America, the Southwestern part (Cape province)of SouthAfrica and the Coastal areas of southwestern and south-eastern Australia

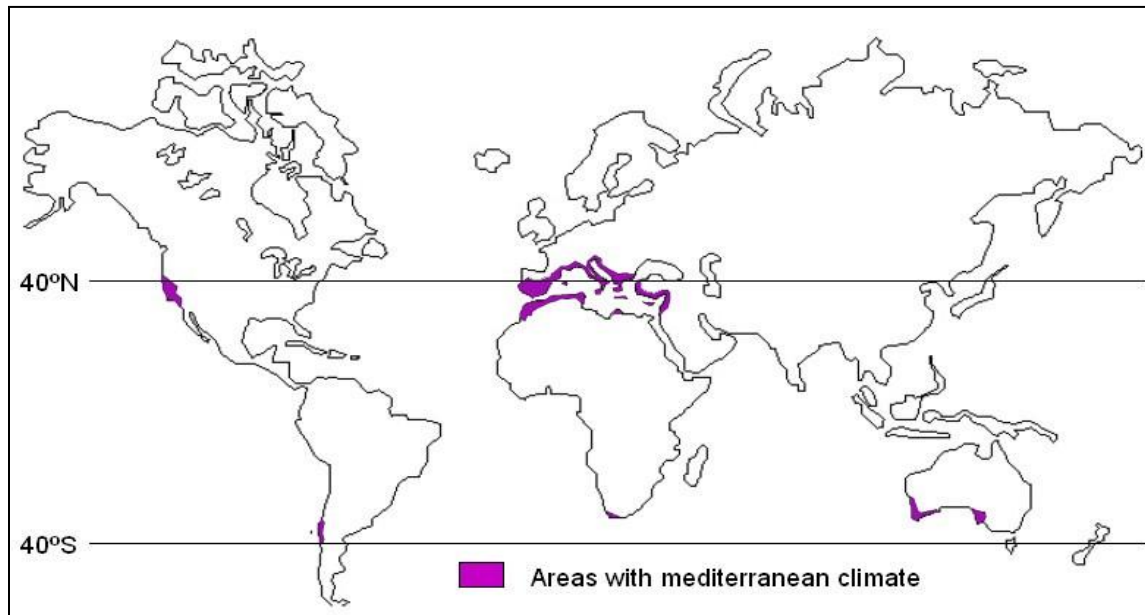
Mediterranean regions are characterized by a unique climate, rich biodiversity, and distinctive vegetation. These areas experience hot, dry summers and mild, wet winters, a climate known as a Mediterranean climate. The vegetation in Mediterranean regions is adapted to this climate, featuring evergreen shrubs, drought-resistant plants, and characteristic species such as olive trees, cypresses, and cork oaks. The biodiversity in these regions is remarkable, with a mix of plant and animal species adapted to the seasonal variations in temperature and precipitation. The Mediterranean Basin is renowned for its cultural and historical significance, hosting iconic landscapes like the Greek islands, the Italian coast, and the Iberian Peninsula. The region's climate has also influenced human activities, including agriculture, particularly the cultivation of olives, grapes, and citrus fruits. However, Mediterranean ecosystems face challenges such as water scarcity, soil erosion, and the impact of human activities on biodiversity. Understanding and conserving the ecological dynamics of Mediterranean regions are crucial for sustainable land management and the preservation of their unique natural and cultural heritage.

Climate

The characteristic climatic features of (3) the Mediterranean climate have developed due to the drastic- seasonal shifting of the pressure and wind belts in Rica, because of the northward and southward shifting of the sun. The average temperature during the cool winter season ranges between 5°C and 10°C whereas the average summer temperature varies from 20°C to 27°C. Thus the annual range of temperature becomes 15°C to 17°C or even more. Mean annual rainfall

ranges between 35 cm. and 65 cm, the most portion of which is received during the winter season. The winter rainfall is received through the cyclonic storms associated with the westerlies

Figure: 4.10 Areas with mediterranean Climate



Source: Google

Mediterranean regions are characterized by a distinctive climate known as a Mediterranean climate, which exhibits mild, wet winters and hot, dry summers. This climate is primarily influenced by the proximity of these regions to the Mediterranean Sea, and it is also found in other parts of the world with similar climate patterns. During the winter, the Mediterranean climate experiences cool and wet conditions, with precipitation occurring mainly in the form of rain. Conversely, the summer months are characterized by high temperatures, extended periods of sunshine, and minimal rainfall. The annual temperature variation is relatively moderate, and the Mediterranean climate is known for its pleasant and temperate conditions. This climatic pattern has significant effects on vegetation, leading to the development of unique ecosystems adapted to seasonal changes. The Mediterranean Basin, including areas in Southern Europe, North Africa, and parts of the Middle East, exemplifies this climate, showcasing a rich diversity of plant and animal life adapted to the challenges and opportunities presented by the Mediterranean climate.

Soils

Mediterranean regions exhibit a diverse range of soils influenced by the region's geological history, climate, and human activities. The soils in these areas are often the result of weathering processes acting on different parent materials such as limestone, schist, and volcanic rocks. The Mediterranean climate, characterized by seasonal variations in temperature and precipitation, plays a significant role in shaping soil properties. The combination of wet winters and dry summers can lead to the leaching of minerals and the development of well-drained soils. However, the prevalence of hot and dry conditions during the summer can also contribute to soil erosion. Common soil types in Mediterranean regions include Mediterranean red soils, derived from weathered limestone and characterized by a reddish colour due to iron oxide content. Additionally, Terra Rossa soils, formed on limestone bedrock, are known for their fertility and are often associated with areas of high agricultural productivity. The intricate interaction between climate, geology, and human activities has resulted in a mosaic of soil types in Mediterranean regions, each with its unique characteristics and implications for land use.

Vegetation

Figure: 4.11 Mediterranean regions vegetation



Source: Google

Mediterranean regions boast a diverse and distinctive vegetation, shaped by the unique Mediterranean climate characterized by mild, wet winters and hot, dry summers. The flora in these regions has evolved remarkable adaptations to survive the seasonal shifts in temperature and precipitation. Evergreen sclerophyllous shrubs, such as the iconic Mediterranean maquis, dominate the landscape, featuring species like rosemary, lavender, and thyme. Olive trees and grapevines are also prevalent, reflecting the historical significance of agriculture in the Mediterranean Basin. The vegetation in Mediterranean regions plays a crucial role in preventing soil erosion, conserving water, and supporting biodiversity. However, human activities, including urbanization and agriculture, pose challenges to the preservation of these ecosystems. Conservation efforts are essential to protect the rich biodiversity and cultural heritage associated with the Mediterranean vegetation.

Animals

Mediterranean regions host a diverse array of animal species, exhibiting unique adaptations to the specific ecological conditions of the Mediterranean climate. The fauna in these regions includes a mix of mammals, reptiles, birds, and invertebrates that have evolved to cope with the seasonal variations in temperature and resource availability. The Iberian lynx, one of the most endangered wild cat species, is found in parts of the Iberian Peninsula, showcasing the region's rich biodiversity. Various species of deer, wild boars, and small mammals also inhabit Mediterranean landscapes. Reptiles such as the Hermann's tortoise and the European chameleon are well-adapted to the warm and dry conditions. The avian diversity is notable, with species like the European bee-eater and the griffon vulture thriving in these environments. Additionally, the Mediterranean Sea itself is home to diverse marine life, including various species of fish, dolphins, and sea turtles. However, human activities, including habitat loss and climate change, pose threats to the wildlife in Mediterranean regions, necessitating conservation efforts to safeguard their unique ecosystems.

4.5 COLD TEMPERATE REGIONS

Cold temperate regions are characterized by distinct seasons, with cold winters and relatively mild summers. These regions, situated between the polar and temperate zones, experience significant temperature variations throughout the year. The vegetation in cold

temperate regions is adapted to withstand freezing temperatures during the winter and take advantage of the more favourable conditions in the summer. Coniferous forests, dominated by species like spruce, fir, and pine, are common in these areas, providing important habitats for diverse wildlife. Cold temperate regions often exhibit rich biodiversity, with various mammals, birds, and insects adapted to the seasonal changes. Notable examples of cold temperate regions include parts of North America, Europe, and Asia. The ecological dynamics of these regions are influenced by factors such as snow cover, permafrost, and the duration of the growing season. Understanding the complexities of cold temperate ecosystems is crucial for conservation efforts and sustainable land management practices in the face of climate change.

PRAIRIE- TYPE REGIONS

Location and extents

Temperate grasslands or prairie-type regions are located in the interior of the continents which come in the westerly wind belt lying between 45 and 60° latitudes in North and South both hemispheres. Due to their more interior locations, they get less rainfall and hence these grasslands are treeless. There are five areas of temperate grasslands:

- (1) The temperate grasslands of Eurasia, known as steppes are most extensive and extend for an east-west distance of more than 3200 km. from the shores of the Black Sea across the Great Russian Plain to the foothills of the Altai
- (2) The temperate grasslands in North America are known as Prairies extending in Canada and the U.S.A.. The Prairies extend from the eastern foothills of the Rockies in the west to the Great Lakes in the east.
- (3) Temperate grasslands in South America are found in Argentina and Uruguay and are known as Pampas.
- (4) Bush veld and High veld of South Africa
are included under temperate grasslands. They are commonly known as Velds.
- (5) Australian temperate grasslands are located in the Murray-Darling basins and are known as Downs. Canterbury grassland of New Zealand is also included under this category.

Prairie-type regions, also known as grasslands or steppes, are vast expanses of open landscapes dominated by grasses and herbaceous plants with minimal tree cover. These ecosystems are characterized by a continental climate with harsh winters and warm summers. Prairies are found on several continents, including North America, Eurasia, South America, and Australia, each with its unique characteristics. The North American Great Plains, for instance, is a prime example of a prairie-type region. The vegetation in these areas consists of a diverse array of grass species, adapted to periodic disturbances such as wildfires and grazing by herbivores. Prairie ecosystems support a rich biodiversity, including a variety of mammals, birds, insects, and plant species, many of which have evolved specific adaptations to the grassland environment. Human activities, such as agriculture and urbanization, have significantly impacted prairie regions, leading to habitat loss and fragmentation. Conservation efforts are essential to protect the unique flora and fauna of these ecosystems and maintain their ecological integrity.

Climate

The temperate grasslands of the northern hemisphere (the Steppes and Prairies) are characterized by continental climate having extremes of summer and winter temperatures, whereas the temperate grasslands of the southern hemisphere (Pampas, Velds and Downs) are characterised by more moderate climate. Summers are warm with temperatures between 20°C and 25°C. Winter season becomes very cold in the northern hemisphere recording -20°C temperature during January. Grasslands of the southern hemisphere are never severe rather it is moderate because of their nearness to the sea.

The average annual precipitation ranges between 25 cm, and 75 cm. in different locations of the temperate grasslands. Most of the annual rainfall is received in the summer season. The winter precipitation in the northern hemisphere is generally received in the form of snowfall and Eurasian Steppes are mostly snow-covered for several months during the winter season.

Prairie-type regions, characterized by expansive grasslands, experience a continental climate marked by distinctive seasonal variations. The climate in these areas is often described as temperate, featuring cold winters and warm to hot summers. The central factor influencing prairie climates is their inland location, away from the moderating influence of large water bodies. Winters can be harsh, with cold temperatures and snowfall, while summers are typically warm to hot, with occasional thunderstorms. The lack of significant topographical barriers allows

for the free movement of air masses, contributing to the variability in weather conditions. Precipitation is often spread unevenly throughout the year, with dry periods during the summer. This climatic pattern, along with periodic natural disturbances like wildfires, has shaped the unique vegetation of prairie ecosystems, dominated by grasses adapted to survive these conditions. Understanding the climatic characteristics of prairie-type regions is crucial for comprehending the ecological dynamics of these grassland ecosystems.

Soils

Prairie-type regions exhibit a variety of soils that play a crucial role in supporting the unique grassland ecosystems found in these areas. The soils in prairies are often classified as Mollisols, which are characterized by a dark, fertile layer known as the A horizon. This layer is rich in organic matter, a result of the decomposition of grassroots and other plant material. Mollisols are highly productive soils and contribute to the flourishing grasslands. The grasses themselves play a key role in soil formation, as their extensive root systems help stabilize the soil and enhance nutrient cycling. The deep root systems of prairie grasses also aid in water absorption and retention, making these ecosystems resilient to drought conditions. The nutrient-rich topsoil layer supports a diverse microbial community that contributes to the decomposition of organic matter and nutrient cycling. However, human activities such as agriculture and urbanization have led to soil degradation and loss of native grasslands in prairie regions, emphasizing the importance of sustainable land management practices.

Vegetation

Figure: 4.12 Prairie-type regions vegetation



Source: Google

Prairie-type regions are characterized by distinct natural vegetation dominated by grasses, herbaceous plants, and occasional flowering forbs. The composition of this vegetation is well-adapted to the specific climatic conditions of these grasslands, which typically experience harsh winters and warm summers. Grasses such as big bluestems, little bluestem, switchgrass, and buffalo grass are common in North American prairies, while feather grasses and fescues are found in Eurasian steppes. The natural vegetation in prairie regions is shaped by frequent natural disturbances, including wildfires and grazing by herbivores, which help maintain the dominance of grasses over woody vegetation. These grasslands are ecologically significant for their rich biodiversity, supporting a variety of plant species, insects, birds, and mammals that have evolved specific adaptations to the grassland environment. Human activities, particularly agriculture and urbanization, have significantly altered the natural vegetation of prairie regions, emphasizing the importance of conservation efforts to preserve these unique ecosystems.

Animals

Prairie-type regions are home to a diverse array of animals that have adapted to the unique grassland ecosystems characterized by vast expanses of grasses and herbaceous vegetation. These regions support a variety of mammals, birds, insects, and reptiles. Keystone herbivores like bison and pronghorn play crucial roles in shaping prairie landscapes through grazing and seed dispersal. Birds such as the greater prairiechicken and the meadowlark are well-adapted to the open grasslands, utilizing them for nesting and foraging. Predators such as coyotes and birds of prey are also integral components of prairie ecosystems, helping regulate herbivore populations. Insects like grasshoppers and butterflies are abundant, contributing to pollination and serving as essential components of the food web. The prairie dog, a keystone species, creates burrows that benefit other animals and influence vegetation patterns. While prairie ecosystems once supported vast herds of native grazers, human activities, including habitat loss and fragmentation, have impacted these populations and the overall biodiversity of prairie regions.

4.6 COLD REGIONS

Cold regions, often referred to as polar or subarctic zones, are characterized by extreme cold temperatures, harsh climates, and distinctive ecosystems adapted to the challenges of freezing conditions. These regions include the Arctic and Antarctic, as well as subarctic areas

found in parts of North America, Europe, and Asia. Cold regions experience long, frigid winters with temperatures often below freezing, while summers are relatively short and cool. Permafrost, frozen ground that remains below the freezing point for two or more consecutive years, is a defining feature of many cold regions. Vegetation in these areas is adapted to the short growing season and may include hardy plants like mosses, lichens, and dwarf shrubs. Animal life in cold regions includes species such as polar bears, Arctic foxes, seals, and a variety of seabirds. Cold regions are vital for regulating global climate patterns and preserving unique biodiversity. However, they are particularly vulnerable to climate change, with rising temperatures leading to ice melt, habitat loss, and changes in ecosystems.

TAIGA-TYPE REGIONS

Location and extents

The sub-arctic region is known as Taiga region which has temperate coniferous forests. The Taigas are located in the northern hemisphere only. The region is located between 55°N and 70°N. This region includes two belts: (i) the Eurasian belt runs from the Scandinavian Mountains through Sweden, Finland and Russia to the Pacific coast, and (ii) the North American belt extends from the Pacific coast in Alaska through Canada up to Newfoundland Island in the Atlantic Ocean. The Taiga region is located between the Tundra region in the north and the temperate grasslands (Prairies and Steppes) in the south.

Taiga-type regions, also known as boreal forests, constitute vast terrestrial ecosystems characterized by extensive coniferous forests and cold climates. These regions encircle the globe at high latitudes, primarily in North America, Europe, and Asia, and are notable for their dominance by coniferous tree species like spruce, fir, pine, and larch. The taiga experiences long, harsh winters with cold temperatures and short, relatively cool summers. The soil in these regions is often acidic and nutrient-poor, influencing the types of vegetation that can thrive. Apart from coniferous trees, the taiga supports a variety of mosses, lichens, and dwarf shrubs. Animal life in the taiga includes iconic species such as moose, wolves, bears, and migratory birds. The taiga plays a crucial role in global carbon cycling and climate regulation, acting as a substantial carbon sink. However, human activities, such as logging and resource extraction,

pose significant threats to the integrity of taiga ecosystems. Conservation efforts are essential to preserve the biodiversity and ecological functions of these expansive boreal forests.

Climate

The Taiga type of climate is characterized by an extreme continental climate marked by severely cold winters for long periods and a cool short summer season. Spring and autumn are merely brief transitional durations between the short summer and long cold seasons. The 10°C isotherm of the warmest months forms the northern limit of this climatic region. Below freezing point temperature continues for about 8 months in a year. For example, the average January temperature is recorded -30°C at Dawson and -26°C at Eagle (both in Canada), and -24°C at Okhotsk, -43°C at Irkutsk and -51°C at Verkhoyansk (all in Russia).

The precipitation is more or less uniformly distributed throughout the year whereas rainfall during summers and snowfall during winters. July is the warmest month has an average temperature of 16°C. Some interior locations record temperatures below freezing point even in July. Thus, the annual range of temperature is very high and greatly varies from place to place. The annual range of temperature is recorded by Verkhoyansk more than 64°C. Taiga type of climate is characterized by low mean annual precipitation ranging between 35 cm. and 60 cm.

Taiga-type regions, characterized by boreal forests, experience a distinctive subarctic or cold-temperate climate. These regions are found at high latitudes, primarily encircling the northern hemisphere, including parts of North America, Europe, and Asia. The taiga climate is characterized by long, cold winters and short, cool summers. Winter temperatures often drop well below freezing, and the ground may be covered by snow for a significant portion of the year. Summers are brief, with temperatures rising above freezing but not reaching the warmth of temperate climates. Precipitation in the form of snow and rain is relatively evenly distributed throughout the year, contributing to the formation of characteristic coniferous forests. The cold climate and short growing season influence the type of vegetation that can thrive in the taiga, leading to the prevalence of cold-adapted coniferous trees like spruce and pine. The taiga's climate plays a crucial role in shaping the ecosystem dynamics of this vast boreal forest biome.

Soils

The soils in taiga-type regions, also known as boreal forests, are influenced by the cold climate, vegetation, and geological factors characteristic of these high-latitude ecosystems. Taiga soils are generally acidic and nutrient-poor due to factors such as slow decomposition rates, limited organic matter turnover, and leaching caused by precipitation. The dominant soil order in boreal forests is Spodosol, characterized by a distinctive horizon called the spodic horizon, rich in organic material, iron, and aluminium. This layer contributes to the acidity of the soil. The cold temperatures inhibit the rapid decomposition of organic matter, leading to the accumulation of a layer of organic material called the O horizon. The nutrient-poor conditions in taiga soils play a crucial role in shaping the plant communities, favouring species like coniferous trees that are adapted to thrive in such environments. Understanding the unique soil characteristics of taiga ecosystems is essential for managing and conserving these boreal forests and the diverse life forms they support.

Vegetation

Taiga-type regions, characterized by boreal forests, exhibit distinct natural vegetation shaped by the challenging environmental conditions of high latitudes. Coniferous trees, particularly spruce (*Picea*), fir (*Abies*), pine (*Pinus*), and larch (*Larix*), dominate the landscape due to their adaptations to cold climates and acidic, nutrient-poor soils. The taiga is often referred to as the "snow forest" because of its prevalence in regions with long, snowy winters. The forest floor is covered with mosses, lichens, and dwarf shrubs, forming a dense understory. Notably, the moss layer retains moisture and contributes to the nutrient cycle in these ecosystems. The taiga's natural vegetation is well-adapted to withstand the challenges of a short growing season, where temperatures can limit the duration of active plant growth.

Figure: 4.13 Taiga-type regions vegetation



Source: Google

Animals

Taiga-type regions, characterized by boreal forests, are home to a diverse array of animals uniquely adapted to the challenges of this cold and coniferous biome. Iconic mammals of the taiga include large herbivores such as moose (*Alces alces*), reindeer or caribou (*Rangifer tarandus*), and white-tailed deer (*Odocoileus virginianus*). Predators, crucial for maintaining ecological balance, include wolves (*Canis lupus*), lynx (*Lynx canadensis*), and the elusive Siberian tiger (*Panthera tigris altaica*) in the Asian taiga. Smaller mammals like red squirrels (*Tamiasciurus hudsonicus*), snowshoe hares (*Lepus americanus*), and various rodents are also common. Avian species such as the boreal owl (*Aegolius funereus*), black-backed woodpecker (*Picoides arcticus*), and various migratory birds utilize the taiga for nesting and breeding during the brief summer season. The taiga's diverse fauna is adapted to seasonal fluctuations in temperature, scarcity of food in winter, and the unique vegetation of coniferous forests. Understanding the ecology of these animals is essential for the conservation of taiga ecosystems and the maintenance of their ecological integrity.

TUNDRA-TYPE REGIONS

Location and Extent

Tundra is a Finnish word which means man barren land Tundra region has the arctic (polar) climate and the least vegetation a is located in North America and Eurasia between the southern limit of the permanent ice cap in the north and the age northern limit of taigs region in the south. Tundra region includes vast areas stretching far beyond the Arctic Circle (63° N). This, Tundra region includes parts of Alaska, extreme northern parts of Canada, the coastal strip of Greenland and northern Siberia. Besides, the tundra region also extends over various Arctic islands.

Tundra-type regions are characterized by vast, treeless landscapes dominated by low-growing vegetation and an extremely cold climate. These ecosystems are found primarily in the Arctic and subarctic regions of North America, Europe, Asia, and Antarctica. The tundra experiences a short growing season, with temperatures often remaining below freezing for a significant portion of the year. Permafrost, permanently frozen ground, is a defining feature of tundra soils and influences the hydrology and nutrient cycling of these environments. The vegetation in the tundra consists of hardy plants like mosses, lichens, sedges, and dwarf shrubs, which are adapted to withstand harsh conditions. The animal life in tundra regions includes herbivores like caribou (*Rangifer tarandus*) and muskoxen (*Ovibos moschatus*), as well as predators such as Arctic foxes (*Vulpes lagopus*) and snowy owls (*Bubo scandiacus*). Tundra ecosystems play a crucial role in global climate regulation and are sensitive indicators of climate change. As temperatures rise, tundra regions are experiencing changes in vegetation patterns, permafrost thaw, and shifts in wildlife distribution, emphasizing the vulnerability of these unique and fragile environments.

Climate

The tundra (arctic or polar) climate is characterized by a general absence of isolation and sunlight and very low temperatures throughout the year. Winters are long and severely cold with temperatures below freezing point for about 8 months. January has the lowest average temperature recording -30°C to -35°C. Coastal areas are warmer than the interior areas. The summer is cool and short, of only 3 months but the days are longer. The sun remains

continuously about the horizon for about 6 months and the other half remains sunless and dark. The starting sun rays do not provide much heat. Much of the insolation is reflected from the ice and snow

Surfaces Due to severely cold climatic conditions and the absence of soils tundra is not conducive to plant growth. Mean annual precipitation is below 40 cm. which is received in the form of snowfall. Thus, winters are long and very severe whereas summers are short, moderately cool and pleasant The growing period is limited to a short period of only 3 months in the summer season.

Figure: 4.14 Geiger climate classification map for tundra climates



Source: wikicommons, authors

The Tundra-type regions are characterized by an extreme and harsh climate, primarily found in the Arctic and subarctic regions of the Northern Hemisphere. These ecosystems experience a polar climate, marked by very low temperatures and a short growing season. Winters are long and bitterly cold, with temperatures often dropping well below freezing. The ground is covered with snow and ice, and the tundra landscape remains frozen for a significant portion of the year. Summers in the tundra are short, with temperatures only rising slightly above freezing. The short growing season during this period allows for a burst of vegetation growth, but the overall productivity is limited. The tundra climate is also characterized by low precipitation, with most of it falling as snow. Permafrost, or permanently frozen ground, is a distinctive feature of the tundra, influencing the hydrology and nutrient cycling of these

environments. The extreme conditions of the tundra climate present unique challenges for both the flora and fauna that have adapted to survive in this frigid and inhospitable environment.

Soils

Tundra-type regions are characterized by unique soils shaped by the extreme cold and short growing seasons typical of Arctic and subarctic climates. The predominant soil order in tundra environments is Gelisol, characterized by the presence of permafrost—frozen ground that persists for at least two consecutive years. The upper layer, known as the active layer, thaws during the brief summer, allowing for limited plant growth. Permafrost acts as a barrier to water drainage, resulting in the formation of waterlogged soils and the development of distinctive features such as frost boils and ice wedges. The soil is often nutrient-poor, with slow decomposition rates and limited organic matter accumulation due to the harsh conditions that impede the breakdown of plant material. Despite the challenges, the tundra soil plays a crucial role in supporting the unique vegetation adapted to these harsh conditions, including mosses, lichens, sedges, and dwarf shrubs. Understanding the complex interplay between permafrost, soil processes, and vegetation dynamics is essential for comprehending the functioning of tundra ecosystems.

Vegetation

Figure: 4.15 Tundra-type regions vegetation



Source Google

Tundra-type regions are characterized by unique and hardy vegetation adapted to the extreme conditions of the Arctic and subarctic climates. The short growing season, low temperatures, and permafrost influence the composition and structure of the natural vegetation. Mosses and lichens, well-adapted to the cold and nutrient-poor soils, form a significant part of the ground cover. Sedges and dwarf shrubs, such as Arctic willow (*Salix arctica*) and crowberry (*Empetrum nigrum*), are also common and contribute to the tundra's mosaic of vegetation. Grasses are sparse in the tundra due to the harsh environmental conditions. The plant community plays a crucial role in preventing soil erosion and influencing the energy balance of the ecosystem. As temperatures rise and permafrost thaws due to climate change, there are concerns about shifts in the composition and distribution of tundra vegetation, potentially impacting the delicate balance of this fragile ecosystem.

Animals

Tundra-type regions are home to a unique and resilient array of animal species that have adapted to the extreme conditions of the Arctic and subarctic environments. Iconic herbivores include caribou or reindeer (*Rangifer tarandus*), muskoxen (*Ovibos moschatus*), and Arctic hares (*Lepus arcticus*). These animals have evolved specialized physiological and behavioural adaptations to cope with the harsh climate, such as thick fur and hooves that allow them to navigate through snow. Predators in the tundra include the Arctic fox (*Vulpes lagopus*), snowy owl (*Bubo scandiacus*), and various species of hawks and eagles. The tundra is also an important habitat for migratory birds, such as sandpipers, snow geese, and Arctic terns, which travel long distances to breed and nest in the summer months. The aquatic ecosystems in tundra regions support marine mammals like seals and whales, while coastal areas may host polar bears (*Ursus maritimus*) in search of prey. The biodiversity of tundra-type regions is essential to the overall health and functioning of these ecosystems, and understanding the interactions among species is crucial for conservation efforts in the face of ongoing climate change.

4.7 SUMMARY

The world's physical and climatic regions encompass a diverse range of ecosystems, each characterized by unique geographical features and climate patterns. Tropical regions near the equator experience high temperatures, lush rainforests, and abundant biodiversity. Moving toward the poles, temperate regions exhibit moderate temperatures with deciduous and

coniferous forests, while cold temperate zones feature boreal forests adapted to colder conditions. Polar regions near the poles are characterized by extreme cold, ice caps, and unique adaptations of flora and fauna. Arid regions, including deserts, experience low precipitation and high temperatures, fostering specialized plant and animal life. Mountainous regions, with varying altitudes, showcase diverse climates and ecosystems. Coastal areas are influenced by oceanic conditions, experiencing milder temperatures and supporting marine life. These physical and climatic regions collectively shape the Earth's landscapes, influence global weather patterns, and provide habitats for a wide range of species. Understanding and preserving the diversity of these regions are essential for maintaining ecological balance and ensuring the well-being of the planet.

4.8 GLOSSARY

- **Tropical Region:** Geographical areas near the equator characterized by warm temperatures, high humidity, and rich biodiversity. Examples include tropical rainforests and savannas.
- **Temperate Region:** Areas with moderate temperatures, typically featuring deciduous and coniferous forests. These regions experience distinct seasons, including colder winters and warmer summers.
- **Polar Region:** Zones near the North and South Poles are characterized by extreme cold, ice caps, and minimal vegetation. Polar regions include the Arctic and Antarctic.
- **Arid Region:** Environments with low precipitation and high temperatures, leading to arid conditions. Deserts are common examples of arid regions.
- **Boreal Forest:** Cold temperate regions characterized by coniferous forests, including species like spruce and fir. Found in North America, Europe, and Asia.
- **Mediterranean Climate:** Regions with hot, dry summers and mild, wet winters. Common in areas surrounding the Mediterranean Sea, California, and parts of Australia.
- **Alpine Zone:** Mountainous regions characterized by high altitudes and cold climates. Alpine ecosystems feature unique flora and fauna adapted to harsh conditions.
- **Coastal Zone:** Areas near coastlines influenced by oceanic conditions. Coastal regions often have milder temperatures and support diverse marine life.

- **Tundra:** Cold environments near the polar regions characterized by permafrost and low-growing vegetation. Tundra ecosystems are adapted to extreme cold and short growing seasons.
- **Steppe:** Semi-arid regions with grasslands and minimal tree cover. Steppe climates experience moderate temperatures but have lower precipitation compared to true grasslands.

4.9 ANSWER TO THE CHECK YOUR PROGRESS

1. What characterizes tropical regions?

- a) Extreme cold temperatures
- b) Moderate temperatures with distinct seasons
- c) Warm temperatures, high humidity, and rich biodiversity
- d) Arid conditions with minimal vegetation

2. Which biome is common in cold temperate regions?

- a) Desert
- b) Tropical rainforest
- c) Boreal forest
- d) Alpine zone

3. Polar regions are characterized by:

- a) Hot temperatures and lush vegetation
- b) Extreme cold, ice caps, and minimal vegetation
- c) Mild temperatures and abundant rainfall
- d) Arid conditions with dunes

4. What defines Mediterranean climates?

- a) Extreme cold temperatures
- b) Hot temperatures and dry conditions
- c) Warm temperatures with high humidity
- d) Hot, dry summers and mild, wet winters

5. Which region experiences low precipitation and high temperatures, leading to arid conditions?

- a) Tropical rainforest
- b) Tundra
- c) Arid region
- d) Boreal forest

6. What is a characteristic of alpine zones?

- a) Low altitudes and warm temperatures
- b) High altitudes and cold climates
- c) Coastal environments with marine influence
- d) Hot temperatures and lush vegetation

7. Where are steppe climates commonly found?

- a) Polar regions
- b) Tropical rainforests
- c) Arid regions with dunes
- d) Semi-arid regions with grasslands

8. Which region experiences permafrost and short growing seasons?

- a) Tropical rainforest
- b) Tundra
- c) Boreal forest
- d) Mediterranean climate

9. What characterizes coastal zones?

- a) Extreme temperatures
- b) Arid conditions
- c) Mild temperatures and oceanic influence
- d) High altitudes and cold climates

10. In which region are coniferous forests commonly found?

- a) Tropical rainforest
- b) Arid region
- c) Boreal forest
- d) Mediterranean climate

Answers:

1.C, 2.C, 3.B, 4.D, 5.C, 6.B, 7.D, 8.B, 9.C, 10.C,

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4.11 TERMINAL QUESTIONS

- 1) What are the key characteristics of tropical regions, and where are they typically located?
- 2) Describe the main features of polar regions and provide examples of polar ecosystems.
- 3) How do arid regions differ from semi-arid regions, and what are some examples of each?
- 4) Explain the concept of permafrost and its significance in certain climatic regions.
- 5) Discuss the role of vegetation in cold temperate regions, specifically focusing on boreal forests.

- 6) What distinguishes Mediterranean climates, and where in the world are these climates commonly found?
- 7) Examine the challenges and adaptations of Animal life in tundra environments.

UNIT- 5 VEGETATION & BIO-GEOGRAPHICAL REGIONS

5.1 OBJECTIVES

5.2 INTRODUCTION

5.3 FACTORS AFFECTING OF NATURAL VEGETATION

5.3.1 FOREST

5.3.2 GRASSLANDS

5.3.3 DESERTS

5.4 BIO GEOGRAPHICAL REGIONS

5.4.1 TROPICAL EVERGREEN RAINFOREST

5.4.2 MONSOON DECIDUOUS FOREST BIOMS

5.4.3 SAVANNA BIOME

5.4.4 TROPICAL DESERT BIOME

5.4.5 MEDITERRANEAN BIOME

5.4.6 TEMPERATE GRASS BIOME

5.4.7 TEMPERATE CONIFEROUS OR TAIGA BIOME

5.4.8 TUNDRA BIOME

5.4.9 MARINE BIOME

5.5 SUMMARY

5.6 GLOSSARY

5.7 ANSWER TO CHECK YOUR PROGRESS

5.8 REFERENCES

5.9 TERMINAL QUESTIONS

5.1 OBJECTIVES

After having the detailed study of this unit you will be able to

- Understand the types of natural vegetation in the world
- Understand the first class biogeography based on climate
- Understand the second class biogeography on the basis of vegetation.

5.2 INTRODUCTION

Natural vegetation is a free gift from nature. Vegetation has grown and thrived on Earth since antiquity. Man has utilized it since he was born, and it has consistently met his needs. The need for an expanding population. To fulfill demand, it was cut down, resulting in virtually little vegetation growing on the land.

Like other resources, natural vegetation is also considered very important for human life. The cover of natural vegetation on the earth shows how much greenery is around it. Natural vegetation plays an important role in maintaining a clean and healthy environment on the earth. About one third of the earth's area is covered with forests, but it is a matter of great concern that in the last few years there has been a huge reduction in forest areas, which has had the biggest impact on tropical areas. Various types of animals and plants are found in natural vegetation, which is their shelter. With the help of vegetation, the climate and fertility of the land of each area is known.

The biosphere refers to the area of the Earth that supports life. All plant and animal organisms that live in the biosphere have an impact on one another as well as on themselves. They are also impacted by the terrestrial environment. Ecology is the study of how organisms and their environment interact. Ecosystem refers to the intricate mutual system that exists between a location's physical environment and the species that live there. This system encompasses the animal world, the plant world, and their physical surroundings. As a result, an ecological system is defined as the link between biological constituents' mutual action and reaction to their surroundings.

In other words, the ecosystem represents the mutual link between the biotic environment and biological constituents. The ecological system is classified into two types of ecosystems: terrestrial and aquatic. The terrestrial eco-system refers to the terrestrial portion of continents and highlands. The aquatic ecosystem encompasses both ocean and freshwater environments. The term "biome" refers to the ecological study of all plants and species. A biome is a large geographical unit that supports various sorts of plant and animal life forms. The biome is separated into climate vegetation and climate vegetation associations.

The following table lists the world's elementary biomes according to climate and vegetation:

5.3 FACTORS AFFECTING OF NATURAL VEGETATION

Vegetation whether bushes or shrubs, may be found all over the world. Whether in the shape of grass or impenetrable trees. Climate and soil combine to cause vegetation to grow. The primary elements influencing vegetation are (1) temperature, (2) water supply, (3) light, (4) ripening, and (5) soil.

(1) Temperature: There is an important relationship between temperature and vegetation. Vegetation requires a temperature over 10°C for at least three months to flourish properly. The July centigrade isotherm forms the Northern Hemisphere's tree line, separating tundra from conical woods. Areas near the 0° centimeter temperature line are typically bare of flora. Because of the high temperatures in scorching deserts, this type of flora has fewer leaves and deeper roots. Cold deserts are home to vegetation that grows above ground or in the shape of tiny bushes and grass. Their roots are quite tiny and slender. Moss and lichen are comparable plant kinds.

The main reason for the difference between tropical broad-leaved vegetation and cold tropical conical or pointed-leaved vegetation is the difference in temperature.

(2) Water supply: Different species of plants are determined by temperature and their sparseness or density is determined by water. The nutrients of the plants mixed in the soil get dissolved by water and reach every organ through their roots. Where the amount of water is more, there is predominance of blooming trees and green grass with bountiful leaves. Moist soil plants (Hydrophytes) are those that grow in excessively humid environments. The stems of such plants are long and thin, the roots are small, and the leaves are wide or thin, but in dry areas like the Sahara, grasses, cattails, and trees with fewer leaves thrive. Xerophytes have lengthy roots. Coniferous woods are found in locations with fewer than 25 centimeters of rainfall in high latitudes, while grass or semi-desert vegetation can be found in areas with more than a centimeter of rainfall in tropical climes.

(3) Light: Light, like water, is important for vegetation. Where there is less light, plants is less able to develop due to a slowdown in the process of food creation (photosynthesis). The green color of the leaves is owing to the light. Trees also get sugar from the reaction of light and gases; when a plant receives less light, its leaves become yellow due to a lack of green color (chlorophyll).

(4) Wind -is a key influence in vegetation growth. Winds are also responsible for rain, which provides water to vegetation; but, due to their severity or blistering heat and dryness, winds can injure flora. The primary effect of wind is to lower the amount of water in vegetation. The wind removes water from the trees through their leaves. Where the winds are full of steam or the trees' leaves are small, the wind might blow very little water.

(5) Soil mitigates the effects of warmth and water on vegetation. Plants solely acquire their sustenance from the soil. Many chemicals and mineral salts placed into soil dissolve in water and offer sustenance for plants. Salt in excessive quantities poisons trees, thus vegetation does not grow there. The amount of water in the soil varies depending on the particle size. Clay soil with microscopic particles contains more water, but soil particles that are coarse retain very little water. The structure of the soil impacts how much water is available to the trees. If the soil is smooth, the trees get more water from it; if the soil is heavy or brittle, they get less.

TYPES OF NATURAL VEGETATION

There are three types of natural vegetation on the earth's surface: forests, grasslands, and thorny bushes.

Forests have a dense density of leafy trees with various shapes. The lack of flora in grasslands is frequently attributed to the absence of trees. Vegetation can be found in deserts, but it is sparsely distributed and takes the form of drought-tolerant plants or bushes.

5.3.1 FOREST

Forests are typically located in areas with higher rainfall or snowfall that melts and gives appropriate moisture to the soil. Forests are typically found in locations with high humidity and temperatures. The extent of woods varies between continents. Dense woods require high temperatures, dense rainfall, an adequate amount of light, favorable wind direction, and fertile soil.

The former Soviet Union has 20% of the world's total forest area, Brazil has 13.4%, and Canada has 10.9%. Other countries have far lower percentages: the United States has 7.9%, Indonesia 2.8%, Peru 2%, and India 2%.

57% of the world's total forest acreage is suitable for wood production. Wood is obtained in this area from forests covering 14,660 lakh hectares (57% of the total area). Impenetrable forest areas can be found throughout the former Soviet Union, Canada, Alaska, and much of Asia and Latin America.

Thus, the former Soviet Union was lucky in terms of the value of forests. On the other hand, most accessible woods in Europe, China, and India have been exploited. The African continent is large, yet due to a variety of circumstances, forest wealth is limited.

TYPES OF FORESTS

Forests are divided into the following five types:

(1) Tropical broad leaf evergreen forests,

- (2) Tropical broad leaf deciduous forests,
- (3) Temperate broad leaf dry evergreen forests,
- (4) Temperate broadleaf 3 deciduous forests, and
- (5) Cold tropical conical evergreen forest.

The extent of forest areas in the world is found to be as follows:

(1) Tropical Broad Leaves Evergreen Forests: These are evergreen forests with large leaves and sturdy wood. These woodlands are located between 10° North and 10° south of the equator. The tropical regions experience high temperatures, humidity, and heavy rains throughout the year. The typical annual rainfall ranges from 150 to 200 centimeters, with temperatures ranging from 27 to 30 centigrade.

Such forests are particularly prevalent in the Amazon Basin, central and western equatorial Africa (Congo Basin), and South-Eastern Asia and its associated islands (Malaysia, Indonesia, New Guinea, etc.). Some valuable and useful trees found in these deep woods include ebony, mahogany bamboo, rosewood, logwood, Brazilian wood, rubber, iron wood, manioc, coconut, banana, silent heart, sago, cinchona, beetroot, bread-foot and so on. Trees, as well as coconut and palm trees, grow along the tidal banks of mangroves and swamps. These woodlands are found at heights ranging from 50 to 100 metres. Because of their density, they are tough to get out of.

These forests, known as Selvas in the Ori-Nico and Amazon Basins, are home to a variety of creepers and vines. The trees are evergreen, meaning they keep their leaves all year, and it is common to see leaves falling from one branch, growing from another and the branches of other trees laden with leaves. Cinchona, which is used to treat malaria fever, is derived from the trees.

(2) Tropical Broad Leaves Deciduous Forests:

Autumn is the season in places of the world where rainfall is seasonal and less frequent. These types are found in the eastern parts of the continents, between 5 and 30 degrees north and south latitude. It only rains here during the summer. Countries with this type of forest include India, Northern Myanmar (Northern Burma), Northern Thailand, Laos, North Vietnam, Central America, Northern Australia, East Africa, Malaysia, and Indochina.

The most well-known trees in these forests are teak, bamboo, sal, palm, sandalwood, mulberry, rosewood, cedar, mahogany, beetroot, mango, Neam, Peepal, Cirrus, Bud, Coconut, and others. Cedar, sal, teak, and shisham wood are commonly utilised in the construction and manufacture of furniture. These trees drop their leaves as soon as winter arrives. Hence, these are

called fallen woods. Because of the little rainfall in Brazil's eastern and north-eastern regions, only shrubs known as Katinga are cultivated instead of dense equatorial forests, and their leaves fall throughout the dry season.

(3) Temperate Broad Leaves Dry Ever green Forests

These forests can be found between 30° and 45° latitude in Mediterranean climate zones or along the continent's western coasts. These sorts of woods are particularly common in Spain, Portugal, Italy, Chile, California, Algeria, and Tunisia. In Europe, these bushes are known as Maquis, while in the United States, they are called Chapparel. The woodlands in these locations are usually green.

It rains here in the winter. As a result, trees capable of enduring lengthy and scorching summers have been discovered. As a result, the trees and plants here have various traits, such as long and branched roots that allow them to collect water from greater depths of the earth, such as grapes and chestnuts. Certain trees, such as cork, mulberry, and oak, have smooth and thick bark. Some trees' leaves are thick, smooth, and hairy, which prevents moisture loss through evaporation.

These forests' major trees include oak, olive, fig, pine, fir, cypress, corrigum, maple, eucalyptus, chestnut, laurel, mulberry, and walnut. Because of the abundance of sunlight, these places are ideal for the growth of trees providing luscious and dry fruits. As a result, juicy fruits such as lemon, orange, grapes, pomegranate, pear, mulberry, grapefruit, and various types of dry fruits such as peach, fig, apricot, almond, pistachio, and walnut are produced in greater quantities.

(4) Temperate Broad Leaves Deciduous Forests

Forests are typically found in the hot sections of the temperate zone. These areas experience spring rain and winter snowfall. These woodlands are typically found in temperate or Western European climates. In the Northern Hemisphere, they stretch east of the interior dry zones between 40° and 60° latitude, whereas in the Southern Hemisphere, they range from 35° latitude in the eastern coastal regions to 40° latitude in the western coastal regions to the extreme south.

These forests are particularly prevalent in China, Japan, Korea, Manchuria, Northwestern Europe, Western Canada, the Eastern United States, and the St. Lawrence region of Canada.

The main types of trees in these forests are oak, maple, beech, elm, hemlock, walnut, chestnut, poplar, ash, cherry, hickory, and birch. These Scorpions provide beautiful and durable wood for building homes and furniture. These forests are typically found in areas with ideal

agricultural conditions. As a result, clearing these woods provided mankind with cultivable ground.

(5) Cold Coniferous Evergreen Forests:

Coniferous evergreen woods are common in temperate climates. This forest is widespread throughout North America and northern Eurasia. All of these include vast tracts of Siberian woods known as Taiga in Russia.

The wood from these woods is exceptionally soft and useful, making it ideal for manufacturing paper, matchsticks, boxes, and so on. The primary trees of these forests include pine (yellow cedar, white pine, Scott pine), spruce (Norwegian spruce, red spruce), hemlock, larch, cedar, and fir (Douglas fir, balsam fir, Cyprus, etc.). These trees are permanently green. Their outer layer is thick and smooth, allowing them to withstand both light frost and strong cold. Due to the chilly environment, relatively little timber is damaged in these forests.

The trees are particularly large in the western parts of these forests, which are close to the sea and receive plenty of rainfall but experience hard winters. Their wood is also hard. In British Columbia, a tree known as Douglas fir is quite valuable; it has a particularly thick stem and is tall.

This region contains some of the world's oldest trees. The wood of these trees is quite soft. During the dry season, these woodlands might catch fire anywhere.

5.3.2 GRASSLANDS

Once you move north or south from the equatorial and monsoon zones, rainfall diminishes, and the rain becomes less concentrated. Except in river basins, the amount of water available elsewhere is insufficient for tree growth. Rainfall exists in certain places, particularly in the spring, yet these trees cannot grow large due to a lack of rainfall. There is a little rain here, but not enough to wet the soil for a long time. As a result, just a tiny portion of the soil becomes wet, which is only beneficial to grasses with shallow roots. As a result, these areas are characterized by large grass fields. The grounds are classified into two types.

(i) Tropical Grasslands or Savannah,

(ii) Temperate Grasslands.

(i) Tropical Grasslands or Savannah

'Tropical grasslands' can be found up to 30° north latitude in the Northern Hemisphere and 30° south latitude in the Southern Hemisphere. This area is primarily located in locations with an annual rainfall of 25 to 75 cm. Their most extensive range is found in Sudan, Venezuela, the

Zambezi River Basin, and the southern half of Brazil. Trees with small leaves or thorns are also present here, such as khejra, tamarind, palm, acacia, and mimosa. The grass stays green during the wet season but dries out in the autumn, winter, and spring. Trees grow in vast numbers only along riverbanks because there is always enough water. As rivers flow away from their banks, they return to dry grasslands. These grasslands exist in Africa, Asia, and Australia, and the grass leaves are stiff, long, and wide. Savannas north of the Amazon River, llanos in the Orinoco River watershed south of the Amazon, are known as *campesina* in Brazil and *parklands* in Africa, respectively.

(ii) Temperate Grasslands

These plains are found in places remote from the sea and with low rainfall. The grass in temperate grasslands is shorter, softer, and less thick than in tropical climates. Because of their vastness, these areas do not support large trees. These grasslands are known by various names. In Asia (where they extend to the districts around Lake Balkhash and the deserts of Manchuria and Ordos) and Europe (to the areas near the Black Sea), they can be found in the steppe, prairies in North America, pampas in South America, and downs in Australia. It's said. And in South Africa, it's known as *veld*.

In these plains, winter is extremely hot and dry, winter is snowy, and spring is wet. The terrain gets moist in the spring as a result of melting snow and occasional rains, and it blooms with green grass and a variety of flowers. This grass remains green for the first part of spring as long as it rains, but as the temperature rises, it scorches and the entire region turns brown. During the winter, the grasslands are frequently blanketed with snow. Summer showers and high temperatures cause a lot of moisture to evaporate. As a result, water does not penetrate deep beneath the earth's surface, and trees are frequently found deficient.

These are only visible along the banks of rivers. These grasslands are home to fast-moving, grass-eating animals such as ostriches and horses. In the spring, wheat is grown more extensively in these plains, and animals graze. The Prairie plains generate so much wheat that they are referred to as the world's food storage.

5.3.3 DESERTS

Desert and semi-desert conditions cover 31.15% of the world's surface area. The quantity of rainfall in these areas ranges from 21 to 51 centimeters, leaving one-third of the world's surface bleak and uninhabited. Even grass cannot thrive in the absence of water. 10 These areas experience searing heat during the day and brutal cold at night, with no rain throughout the year. Deserts like these can be found near the Tropics of Cancer and Capricorn. In terms of area, the main deserts are as follows:

Due to a lack of rainfall in the monsoon regions travelling westward vegetation takes the shape of prickly plants or shrubs. These locations are known as hot deserts.

Similarly, when we approach closer to the poles, the grass in hot meadows declines, and these grasslands eventually turn into deserts. Cold deserts are defined as areas with extreme cold and snowfall, as well as the lack of summer.

(i) Hot Desert Vegetation

This plant is found in the western parts of the continents with hot and dry climate. Its expanse is found in Arabia, Iran, Iraq, Afghanistan, and Baluchistan etc. Some of the trees growing under them have very long and thick roots. Due to which the soil can suck the internal water from the lowest depth and store it in its thick parts. The leaves and stems of some plants are very thick. These stems are naturally much protected because the water cannot escape from them and remain dry. It remains stored in them to protect them from the climate. There is a kind of waxy cover on the leaves of some trees which prevents the evaporation of leaves. Some have sharp thorns on their stems which prevent them from being eaten by animals. Some have pulp on some stems.

The vegetation of hot deserts can be divided into mainly four parts: (a) Dry grasslands Plains are found in those areas where tropical grasslands end and deserts begin. Grass like *Sarpat* grows on them. (b) Thorny bushes: These bushes are found in those parts where the desert ends and the Mediterranean region begins. (c) Thorny trees (like acacia, *ker*, *khejra*, etc.) are scattered here and there in the central part of the desert. (d) Fertile parts of deserts - The water from the mountains surrounding the deserts gets absorbed into the foothills of the mountains and reaches some hard rock below and then comes out in the central part of the desert or in the form of natural sources. Grapes and palm trees grow in abundance around these oases. The largest oases in the world are found in the Nile River valley in Africa.

(ii) Cold Desert Vegetation

This plant is found in the extreme northern parts of Eurasia and Canada. There is almost a lack of vegetation here due to the harsh winter and short summer. In winter, the land is covered with snow and trees and plants do not grow, but in winter, when the snow melts, many types of small grasses grow quickly and in which many types of colorful flowers bloom, but in these areas, The joker remains till he dies. With the end of summer, these grasses also end. Apart from grass, lichen or moss is found there and some small bushes like blackberry, hartleberry, willow, sedge, bilberry, blueberry etc. are found there. The life of vegetation in this area lasts for a very short time.

5.4 BIO GEOGRAPHICAL REGIONS

Table: 5.1

first class biome ((depending on climate)	Second class biome (depending on vegetation)
1. Tropical biome	(i) Forest biome
	(ii) Savanna biome
	(iii) Desert biome
2. Temperate biome	(i) Warm temperate biome
	(ii) Mediterranean biome
	(iii) Grassland biome
	(iv) Deciduous forest biome
	(v) Taiga forest biome
3. Tundra Biome	(i) Alpine Tundra Biome
	(ii) Arctic tundra organisms

TROPICAL FOREST BIOME

It has the following parts:

1. Tropical or evergreen rain forest biome
2. Monsoon deciduous forest biome
3. Mountain Forest Biome

5.4.1 TROPICAL EVERGREEN RAINFOREST

Location and extent: This biome reaches up to 10 degrees latitude on both sides of the equator. This comprises the Amazon Basin of South America, the Zaire (Congo) Basin of Africa, the area between Nigeria and Guinea, and some sections of South-East Asia. Indonesia's Java, Sumatra, Bali, Borneo, Selbiz Islands, Myanmar, Malaysia, India's Western Ghats and some portions of Assam, Vietnam, Laos, and Cambodia are notable. This type of woodland also exists in Queensland, Australia. Although the biome's major area is 10 degrees north and 10 degrees south. It is between latitudes. Its spatial range goes beyond these latitudes. For example, in South America, this biome stretches southward along river basins in the Irregular Basin to the Mato Grasso Plateau. A tiny patch of it in Argentina at 25° S has shifted to latitude. It is also available

in Peru, Ecuador, and Colombia. Venezuela, Vienna, eastern Panama, eastern Nevada, eastern Honduras, and Guatemala form its northern extension. Tropical rain forests are also found in eastern Cuba, Jamaica, and northern Puerto Rico.

Climate: The climate is dependent on convective rainfall. The average annual rainfall is 200 cms. It rains throughout the year, with 10 cms falling every month save two or three. It rains more. The amount of rainfall exceeds evaporation, resulting in excess water throughout the year. The average yearly temperature is 20°C. The maximum temperature rarely approaches 30°C. Is greater than, and the minimum temperature is never less than 10 degrees Celsius. Is not less than.

The temperature remains constant throughout the year, and the annual temperature is extremely low. Daily temperature variation exceeds annual temperature variation. Because of the high temperature and humidity, the climate here provides ideal circumstances for plant and animal development and growth, earning it the name "optimum biome."

Botanical characteristics: The environment here is ideal for plant growth, therefore lush dense forests can be found. Due to the deep trees, sunlight does not reach the surface, and it remains gloomy even during the day. As a result, trees compete for the sun's heat, and the world's tallest trees thrive here. This biome's areas contain an abundance of plant species. There are 6000 to 7000 blooming plant species in West Africa, 20,000 in Malaysia, 40,000 in Brazil, and 2000 in the Panama Canal Zone Castes.

Trees constitute the most important portion of the biome's vegetation, accounting for 70% of all species. The overall number of species is so large that 40 to 100 can be discovered on one hectare of land. In comparison, temperate forests have no more than ten species per hectare of land. Tall, closely spaced trees thrive across this ecosystem, their crowns forming an impenetrable, continuous canopy. Because of this, sunlight is unable to reach the bottom. The lower two-thirds of these trees have no branches, whereas the upper one-third has numerous branches. Because of its huge and evergreen leaves, this plant is also known as the broad-leaved evergreen forest. The rain woods of the Amazon Basin are known as Selva.

Creepers, or climbers, are another key component of tropical rain forests. These woodlands house 90 percent of the world's vines. Their sizes are very diverse. These can be stemmed to lengths of up to 20 cm. They are extremely twisted, and it is impossible to calculate their length. It reaches the peak with the help of trees, then drops and climbs back up with the help of another tree. This inclination of the vines represents their struggle to receive the maximum amount of sunlight. Vines cause so much hindrance while climbing up and down trees that strolling in the forest becomes impossible. Vines are separated into two major parts:

- (i) Lower level creepers are herbaceous plants that thrive in the forest's lower levels.
- (ii) Long vines are found at all levels of the forest, with lianas being the most important. They climb up using tree trunks and branches. Some vines are rope-like, while others have stems up to

20 cm long and can grow thick. Their length can reach up to 240 meters. These reach the high canopy, where there is ample sunshine. They resemble trees due to the abundance of leaves in their crowns.

Animal Life:

This biome supports a diverse range of creatures. Some are active during the day and others at night. As a result, this biome is active at all hours of the day. Because of the deep forest, heavy-bodied animals cannot spread easily, and their numbers are similarly limited. On the contrary, a great number of such critters exist that live on trees and can earn a living without leaving the ground. Monkeys, gorillas, numerous varieties of birds, several types of insects, snakes, and invertebrates that climb and crawl on trees prevail, with the cheetah being one of the larger animals. Buffalo, elephants, and pigs are prominent. However, their number is relatively low.

Several sorts of insects continue to crawl across the surface. There are also some really venomous snakes and flies living there. In general, the number of creatures grows from below to above.

5.4.2 MONSOON DECIDUOUS FOREST BIOMS

Location and extent: The monsoon deciduous forest biome is found mostly in Southern Asia, South-East Asia, Southern China, the Western Islands, Northern Australia, East Africa, and the coastal regions of Central America and Brazil. These zones are located between 5° and 30° latitude in both hemispheres. The beaches are wide.

Climate: Temperature and rainfall vary seasonally in sections of the monsoon deciduous woodland biome. Summer temperatures in some locations range between 30° and 45°C. The temperature in winter ranges from 10° to 27°C. Monsoon winds cause rainfall during the summer. The average yearly rainfall is 150 cm. However, in certain situations it is 50 cm. summer monsoon winds account for less than 80-90% of total annual rainfall. The majority of monsoon rainfall occurs over the three to four months between June and September. The subsequent 8 to 9 months are mostly dry. There is a surplus of water during the rainy season and a scarcity of water during the dry season.

During the rainy season, vegetation thrives owing to the amount of water, however during the dry season; trees shed their leaves due to a shortage of water. For this reason, it is known as the monsoon deciduous woodland biome. Evergreen trees, however, can be found in locations with higher rainfall.

Plant community and structure: The plant community is less thick than in the evergreen rain forest, and the number of plant species is likewise lower. Because of the lower number of trees, there is less competition for sunlight, resulting in a lower tree height. The average height of the trees here ranges from 12 to 50 meters.

The plants are separated into four levels based on their height. The first two levels consist of large and little trees. On the third level, there are bushes in the garden. At the fourth level, grass grows. Most trees are deciduous, whereas shrubs are evergreen. Particularly, the quantity of vines is reduced. Evergreen forests grow in locations with abundant rainfall. In locations with less rainfall or longer dry spells, trees grow scarce, while grasslands become denser. The trees' leaves are either big or F1, allowing them to tolerate the most rainfall during the rainy season. May fall owing to a lack of moisture during the dry season, or they are too little and unable to survive dryness. The trees' branches are also shorter than those in the evergreen rain forest. These trees have robust trunks and a rough skin. These forests have fewer plant species than evergreen rain forests. One hectare of land typically supports 30 to 40 plant species. However, in certain regions, trees of a single species cover a large area.

Monsoon forests have a less dense canopy than rain evergreen forests. The canopy of Sal and Teak trees does not form an umbrella like that of evergreen forests. The principal trees in this biome include Shisham, Mahua, Teak, Sal, Neem, and Jamun. Acacia trees grow in locations with limited rainfall.

During the dry season, a significant amount of dry materials collects on the surface. As a result, forest fires break out. Man also sets fires to clear woods. Humans have felled these forests extensively for farming purposes, resulting in significant damage. The destruction of forests has resulted in a variety of issues, including soil erosion, floods, and drought.

Animal Life: Monsoon forests provide a diverse range of animal species. These woodlands contain herbivorous and carnivorous creatures, as well as a variety of birds and insects. Elephants, horses, rhinos, lions, and wild buffalo are all huge creatures. In monsoon forests, trees stay green throughout the rainy season and drop their leaves during the dry season. Animal reproduction, development, and migration habits show temporal changes as a result of this shift. Many animals travel during the dry season to find water and food. Many birds migrate across large distances in Africa.

5.4.3 SAVANNA BIOME

Introduction and definition: Different scholars have inferred several meanings from the word 'Savannah'. For a climatologist, Savanna represents a tropical wet and dry climate. For botanists, 'savanna' refers to grass-dominated vegetation in the tropical zone. Is from, according to geography, "Savanna is tropical grassland in which trees and tall shrubs grow in the open."

Location and extent: Savanna is a tropical biome that ranges from 10° to 20° latitude on both sides of the equator. This includes large parts of South America, Colombia, Venezuela, south-central Brazil, Guyana, and Paraguay, mountainous regions of Central America, large parts of Central and Eastern Africa (particularly Sudan and the Sahel region), peninsular Madagascar,

Northern Australia, and the Eastern Aravalli. Certain areas of India are included. This biome is most widespread in Africa.

Climate: Because the Savanna is located within the tropical zone, the climate is hot. In which high temperatures persist throughout the year. The temperature in most places ranges between 25° and 30°C. It occurs whenever the temperature falls below 20 degrees Celsius. Is not less than. Rainfall amounts vary locally. The average annual rainfall in the areas close to the tropical rain forest biome is 150-200 cm, whereas in the parts near to the desert biome it ranges between 25° and 50° cm. Only this remains. The majority of the rainfall occurs during the summer, when the equatorial convective rain belt swings north and south in response to the Sun's perpendicular beams. Winter is dry.

(i) During the cold-dry season, the day temperature ranges from 26° to 32°C, with a night temperature of 21°C. Falls until, (ii) during the hot-dry season, the sun's rays fall practically perpendicularly and there is an abundance of insulation; as a result, the temperature fluctuates between 32° and 35°C. (iii) Heavy rainfall happens throughout the hot and humid season. This season has 80 to 90 percent of the usual rainfall.

Vegetation Community: The Savanna biome's major vegetation is grass. Some areas have clumps of trees, which is why it is commonly referred to as parkland. The nature of vegetation changes significantly between the tropical rain forest and desert biomes. Near the desert, the grass is scanty, and plants thrive in some areas. As we approach the tropical rain forest region, the grass grows denser and the trees multiply.

5.4.4 TROPICAL DESERT BIOME

Introduction and Definition: A desert is a land area with limited rainfall (often less than 25 cm per year) and a lack of flora and water. Rainfall is low and sporadic, and evaporation exceeds rainfall. There are various sorts of deserts throughout the world. The main deserts are listed below: (i) A hot desert with high temperatures and temperature differentials. (ii) Mid-latitude deserts are situated in the middle of continents, such as the deserts of Central Asia; and (iii) Cold deserts have low temperatures. These are found in arctic and tundra environments.

Location and extent: Tropical deserts are found in the western regions of the continents in the tropical zone. These are primarily found between 20° and 30° north and south latitudes. The world's main tropical deserts are the Sahara in North Africa, Kalahari in South Africa, California, Arizona, and Mexico in North America, Atacama in South America, Arabia in South-West Asia, Thar in India and Pakistan, and the deserts of Western Australia.

Climate: This climate is distinguished by a low annual rainfall (less than 25 cm) and a wide range of temperatures. In certain locations, it rains once every 4-5 years. In the winter, the night temperature drops below freezing, but in the summer, the day temperature can rise beyond 50°.

The key variables influencing this climate are high air pressure (horse-latitude), air falling from above, dry southerly winds, and cold ocean water currents along the continents' western coasts.

Vegetation: Tropical desert regions are typically devoid of vegetation. However, some plant develops in these regions too. 25 cm. Desserts are areas that receive up to 20 cm of rainfall per year. Even during the annual downpour, prickly shrubs and fodder sprout. However, there are some areas where nothing grows. Fertile areas can be found throughout the vast arid lands. At these locations, subsurface water rises to the surface. These are known as oases. Some oases are small and contain only a few palm trees. However, some other oasis is extremely huge, covering several hundred square kilometers. These are very productive areas where agriculture is practiced. The majority of the trees here are date palms.

Animal life: There are fewer animals in scorching deserts since there isn't much vegetation. The creatures here are all brown. This color resembles sand, making it simpler for animals to hide. The camel is the most important animal, as it can survive for a week without drinking water. Its wide feet are padded and will not sink into the sand. It can transport big loads over great distances, which is why it's known as the Ship of the Desert. There is enough fat in its hump to serve as food in the event of a food shortage. Other creatures include foxes, lizards, and a variety of insects. To avoid the blistering heat of the afternoon, most species go about their daily duties in the morning or after nightfall. Carnivorous creatures hunt at night.

5.4.5 MEDITERRANEAN BIOME

Location and extent: This biome is found in the western parts of continents in both hemispheres, ranging from 30° to 40° latitude. This biome is dominated by the Mediterranean Sea's coastal areas, hence the name Mediterranean biome. This encompasses Southern European and North African nations. Portugal, Spain, France, Italy, Greece, and sections of Yugoslavia are among the southern European countries, whereas northern Morocco, Algeria, and Tunisia are in North Africa. This biome also includes parts of North America's California, South America's Central Chile, the far south-western part of South Africa, and the coastal areas of south-western Australia.

Climate: This biome's climate is characterized by hot, dry summers and damp autumns. No other biome in the world has this type of seasonal climate. The average temperature here in the summer ranges from 20° to 27° Celsius, and drops to 5° to 10° Celsius in the winter. Thus, the annual temperature difference ranges from 15° to 17°C. This happens. The average yearly rainfall ranges from 37 to 65 cm. The majority of the rainfall comes in the winter, while the summer is often dry. The reason for this is that the winds fluctuate with the position of the Sun. In the summer (June), the Sun shines perpendicular to the Tropic of Cancer, causing these locations to be influenced by subtropical high pressure. In other words, throughout the summer, these places are to the north of the easterly winds. These winds are incapable of producing rain. As a result, throughout the summer, the surrounding area resembles a desert. In contrast, in

winter (December), the Sun shines perpendicularly on the Tropic of Capricorn, and these places are influenced by westerly winds. These winds produce rain. As a result, this location experiences a humid winter climate.

Vegetation: The Mediterranean biome contains many different species of trees, shrubs, and grasses. The vegetation here has an excellent system for reducing moisture loss through transpiration. Some trees leaves bark, and roots include components that aid minimize transpiration. This is known as xenomorphic structure. Some trees have tiny or prickly leaves that help regulate transpiration. Some trees' bark is extremely thick, limiting transpiration. Some trees have deep roots. Because of this, the trees receive adequate subsurface water and remain green even during dry summers. That's why it's also known as the Mediterranean evergreen woodland biome.

Although the vegetation in different sections of the Mediterranean biome is very similar, there are some variances at the local level. For example, the vegetation of Europe, North America, Africa, and Australia, while roughly similar, varies from one another.

Animal Life: Animal life in the Mediterranean biome exhibits regional diversity, similar to vegetation. There are 201 vertebrate species in Southern California. Of these, 75% are avian species. Mule deer are common among the mammals here. Chile also contains vertebrate creatures. The guanaco is an important mammal here. Mountain lion, wolf, and bear populations have declined as a result of forest loss. Other notable animals are deer, rabbit, lizard, and snake. Eagles and hawks stand out among the birds. Following European settlement in Southern Africa, woodlands were destroyed on a huge scale, causing wild species to practically become extinct. In some distant places, you can see deer, monkeys, and leopards. Australia is home to many different kangaroo species. Many kinds of birds live in the bushes and grasses.

5.4.6 TEMPERATE GRASS BIOME

Location and extent: These are temperate grasslands found in the interior of continents. They are most common in Eurasia, ranging from the Black Sea in the west and the Caspian Sea in the east to the hilly regions of Central Asia. It covers extensive areas of Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan. Temperate grasses thrive throughout extensive parts of Russia. These grasses thrive in the rain shadows of the Canadian and American Rocky Mountains. Temperate grasses grow in the rain shadow zone of the Andes in Argentina and Uruguay. Temperate grasslands can also be found in the high mountains of Southern Africa, the south-east of Australia (Murray-Darling Basin), and New Zealand's Canterbury Plains.

Climate: The Northern Hemisphere's temperate grassland areas are located in the heart of continents, away from the sea, and so have a continental climate. Summertime temperatures here average 27°C. It reaches 30°, and in the winter, the temperature drops below freezing. It is apparent that the annual temperature variance is extremely high in these places. The land area in

the Southern Hemisphere is small, and the region is close to the sea, therefore the sea has a land-forming effect on it. As a result, the temperate grassland parts of the Southern Hemisphere experience little climatic fluctuations, and annual temperature variance is lower than in the Northern Hemisphere. The average yearly rainfall ranges from 25 to 75 cm. The majority of rain falls during the summer months.

Vegetation: As the name implies, these are temperate grasslands where grass grows long and wide. It goes by several names in different locations. For example, they are known as Prairie in North America, Steppe in Eurasia, Pampas in South America, Belt in Africa, and Downs in Australia.

The majority of Eurasia's steppe biome is situated in Russia. That is why it is dubbed the Russian Steppe. The north contains temperate forest biomes, whereas the south contains dry regional biomes. Depending on the quantity of rainfall, the entire land is divided into forest and grass steppes. In the European half of the forest steppe, oak, pine, elm, and maple trees grow alongside grasses, whereas in Siberia, birch, aspen, and willow trees coexist. 40 to 60 centimeters in the northern half of this area. The average annual rainfall allows trees and grass to grow. In contrast, the southern region has very little grass due to little rainfall.

The Prairie biome has emerged in North America, between the Rocky Mountains to the west and temperate deciduous woods to the east. Rainfall falls from east to west, resulting in a drop in grass height. Tall prairie grasses thrive in the east, reaching heights ranging from 1.5 to 2.4 meters. Among the grasses, groves of oak steppes and hickory trees flourish. In the middle, there is a mixed (grass and tree) prairie with grass heights ranging from 0.6 to 1.2 meters. The vast plains of Canada and the United States have hosted the majority of its development. To the west of the Great Plains sits the short grass prairie, which the grass height is less than 0.6 meters.

Argentina is home to the most developed South American pampas. Pampas grass grows on around 12% of Argentina's territory. Here, 40 to 80 cm. Average yearly rainfalls occurs, resulting in moderately high humidity levels. Hence, the grass grows nicely here. Rainfall is higher in the east (about 90 cm) and lowers in the west (around 45 cm). As a result, long grasses grow in the eastern sections, known as humid pampas. Because of the lower rainfall in the western region, short grasses known as semi-humid pampas thrive. There are many grass species here, including Briza, Bromus, Panicum, and Lolium.

Africa veld grass can be found in mountainous areas of the southern region at elevations ranging from 1500 to 2000 metres. These grasses can be found in places with moderate moisture in the Southern Transvaal, Orange Free State, and Liso states. Africa Veld is separated into two regions based on its altitude. Hameda Veld grows in the lower areas. This area is located at an elevation of 1500 to 1750 meters. Alpine Veld grows on higher elevations ranging from 2000 to 2500 meters.

The Australian Downs are located in the south-east of Australia and Tasmania. In addition to grasses, eucalyptus trees and bushes flourish here. Tall grass thrives in locations with heavy rainfall. This is known as kangaroo grass. The region receives less rainfall, allowing short grasses to grow successfully. Tufted grasses are abundant in New Zealand. Originally, two grasses grew in the centre of the North Island and the east of the South Island. However, with the advancement of animal husbandry during the last century, the nature of these grasses has changed. Primordial terrestrial grasses are disappearing. There are two types of grasses growing here: long and short.

Animal Life: The temperate grass biome supports a diverse population of species. The environment here is dominated by grasses, which attracts more herbivores. The Eurasian steppes are home to antelope, gazelles, horses, and other herbivores. Rodents are common among burrowing animals. They spend the day hiding in their holes and come out at night in quest of food. Wolf, eagle, and hawk are examples of predatory creatures, as are other bird species. Bison and pronghorn antelope grazed freely throughout North America's prairies. Similarly, carnivorous species such as eagles, hawks, foxes, and wolves coexisted in vast numbers. However, the expansion of agriculture and animal husbandry by European races has resulted in a significant loss of animals here. The Pampas of South America are home to pampa deer, burrowing insects, rabbits, wolves, and several bird species. Wheat farming has begun throughout most of the Pampas, resulting in widespread devastation of natural plant and animal life. The African veld is home to herbivores such as zebra, antelope, and cows, as well as carnivores such as lion, wolf, and jackal. Kangaroos are the most significant animals in Australia's temperate grasslands. It is a symbol of vegetarian lifestyle. Aside from that, various herbivores, birds, and waders reside here. The rise of animal husbandry and wheat farming has resulted in a significant loss of fauna in these areas. Like Australia, New Zealand's original species have practically become extinct as a result of the advent of animal husbandry.

5.4.7 TEMPERATE CONIFEROUS OR TAIGA BIOME

Location and extent: This biome is found in southern North America and the Tundra region of Eurasia. It is found in Canada and Russia in the shape of a large strip running east-west. This strip is wider in Russia than in Canada and covers the entirety of Siberia. This biome does not exist in the Southern Hemisphere because there is no land at these latitudes.

Climate: This region has a chilly climate. The summer season is brief and normal, whereas the winter season is long and harsh. The temperature never rises above freezing degree during the winter. Cold winds make the winter season even more severe. The average July temperature is 10°C. However, summer temperatures can be quite high, with a maximum temperature of 32°C., has not been registered. Rainfall averages 50 cm and seldom exceeds 70 cm. Rainfall occurs throughout the year; however the highest rainfall occurs in the summer. Occurs during the season. Because of the continental climate, the temperature differential is significant. Verkhoyansk's summer (July) temperature is 15.5 degrees Celsius. In the winter (January), the

temperature can reach 50°C. Thus, the yearly temperature differential here is 65.5 degrees Celsius, the largest in the world.

Vegetation: Low temperature compensates for the absence of rainfall by reducing evaporation. As a result, this area is home to evergreen forests. Nonetheless, due to a shortage of rainfall, thorny woods thrive here rather than broadleaf forests. For these reasons, it is known as the temperate forest biome. In Canada, it is referred to as Taiga Forest. These woodlands are home to trees of typical height, including larch, spruce, pine, birch, and fir. The surface is covered in ordinary shrubs, moss, and lichens. Sparse woods are characterized by low tree density. However, the temperature in the south is greater than projected, resulting in increased tree density. Low temperatures, lengthy winters, and snowfall reduce tree diversity in these woods. As a result, trees of the same species spread across large distances. The trees in these woodlands show relatively little stratification. Because of the presence of groupings of trees of the same species, the business of harvesting wood in these places has expanded significantly.

Animal Life: Due to the harsh temperature, fewer animals reside here. Because of the hard winter, seasonal animal migration is a significant activity. These creatures migrate south at the start of winter and north in the summer. Herbivorous and non-vegetarian species coexist here. The taiga forest is home to two different types of wildlife. (i) Organisms that suck tree sap, such as aphids; (ii) Organisms that graze grass and thrive on tree shoots. The principal animals are reindeer, bears, and foxes, as well as many birds and insects. Many animals have coats to shield them from the harsh cold. Such creatures include minks, martens, and beavers

5.4.8 TUNDRA BIOME

Location and extent: It stretches from the Arctic Ocean coast in the north to the temperate forests biome in the south. This encompasses Canada and northern Eurasia.

Climate: This is a biome with extremely frigid temperatures. The winter season is harsh and long, whereas the summer season is extremely brief. The temperature here remains below freezing during the winter season and is only slightly above freezing in the summer. Even in July, temperatures below 10°C remain constant. For most of the year, the ground remains frozen and frigid winds known as Purga blow. The yearly rainfall here ranges between 25 and 30 centimeters, with the majority of it falling during the summer.

Vegetation: Tundra literally means "barren land." The climate here is clearly unfavorable for vegetation growth, and very little vegetation grows. During the lengthy winter, the earth freezes and becomes bare of vegetation. As soon as summer arrives, the snow melts and a variety of flowers, mosses, and lichens begin to sprout. The vegetative growth phase is shorter than 50 days every year. Most of the plants are tufted. Who has a height of 5 to 8 cm. They tend to stay to the ground because the surface temperature is higher than the air temperature above. Small plants develop in areas where snow buildup provides protection from strong freezing winds. These are known as Arctic willows. Their stems and leaves reach only a few centimeters above the ground.

They grow slowly yet have a lengthy lifespan. Some plants live for 150 to 300 years, creating a mattress-like covering.

Animal life: This biome supports two distinct sorts of creatures. The first kind is permanent residents, who, due to their bodily structure, can withstand the harsh cold of winter. These creatures have a thick layer of fur or feathers on their bodies to shield them from the harsh cold. This category includes fauna such as fish, musk ox, bear, fox, reindeer, and rabbit. The second species of creature is migratory, moving south to Tundra habitats during the winter. They lack the strength to withstand intense cold. These animals include bears, wolves, reindeer, caribou, red deer, dogs, and birds.

5.4.9 MARINE BIOME

The ocean is totally filled with water; hence the marine biome differs from the terrestrial biome. Because sunlight may reach the water up to 200 meters deep, favorable conditions for the formation of fauna and vegetation can only be found there. The ocean's upper surface is known as the photic zone. This division is home to both primary producers (plants) and primary consumers (animals). The diet of creatures found at depths greater than this is silt, which comes from a variety of sources. The marine biome is separated into two sections based on depth: pelagic biome and benthic biome.

(i) Pelagic Biome: The pelagic biome of depth is divided into two parts.

(a) Euphotic or Photic Biome: It encompasses the sea region up to a depth of 200 meters. The continental shelf is the only area of the sea where sunlight may penetrate.

(b) Aphotic Biome: It extends from 200 meters to the ocean's bottom. It contains three secondary divisions. (i) The middle pelagic zone reaches up to 1000 meters; (ii) the severe pelagic zone extends up to 4000 meters; and (iii) the extremely severe pelagic zone extends up to 6000 meters. The paucity of light and severe pressure in the unpolluted biome makes conditions unfavorable for the formation of life. As a result, only certain creatures thrive here.

2. Benthic Biome: The sea bottom biome is known as benthic biome. It also contains three sub-departments. (i) Littoral zone, which refers to the marine area between high and low tides. (ii) Sub littoral zone, which covers the undersea portion of the continental shelf; and (iii) Deep sea benthic zone, which extends to depths of 6000-7000 meters.

On the basis of habitat, seahorses are divided into three classes:

(a) Plankton: These are microscopic plants and animals which float in water. Their development takes place in the illuminated circle.

(b) Nekton: These are powerful swimming creatures of large size which keep roaming in every area of the ocean, like fishes.

(c) **Benthos:** Plants and animals that grow in deep water on the ocean floor are called Benthos.

MARINE COMMUNITY

Marine community is divided into the following three classes.

Plankton Community

These include microorganisms and plants. Phytoplankton derives nourishment by photosynthesis, so they are known as primary producers or autotrophic organisms. Plankton is a food source for many sea animals. Algae and diatoms are its emblematic plants. Plants in this category are referred to as phytoplankton and animals as zooplankton. Phytoplanktons are extremely small, but they have enormous reproductive potential, allowing them to continue to grow despite heavy consumption. Zooplankton is a unique group of creatures that includes both herbivorous and carnivorous species. Some plankton feed on sediments. Their size ranges from very tiny to several meters. Among these, herbivorous plankton plays an important role because they provide food to carnivorous plankton and other carnivorous organisms by consuming grass plankton.

Nekton Community

A nekton community is a group of animals that float freely in the ocean at various depths. Most of them are vertebrates. Fish is the most important member of the community. Some fish swim in shallow water, while others roam in deeper water. Herring lives in shallower waters, whereas cod and haddock live in deeper water. This group includes several mammalian species that exist in both aquatic and terrestrial settings. For example, seal fish spawn on land yet get their nourishment from the sea. Whales and fish have always lived in water. Some birds swim in seawater and eat other organisms.

Benthos Community

This category includes creatures and plants that live on the seafloor. These come in a variety of shapes and sizes, making it difficult to define them. This is due to the fact that they have both flora and fauna characteristics, a big population of hard-shelled animals, and a diverse range of species. Similar organisms include mussels, conchs, coral, and snails. They are both vegetarian and non-vegetarian.

5.5 SUMMARY

Vegetation on Earth is quite diverse, at least according to our preconceived notions of distinction. Forests, grasslands, tundra's, deserts, and ice sheets are five distinct types of habitats for various plant and animal species. We determine what type of vegetation we are dealing with by examining the primary species that inhabit and create the region. Forests may grow in

practically any terrain, including sea level and high mountain ranges. Forests may grow in practically any terrain, including sea level and high mountain ranges.

Biogeography is best observed on the world's islands. Because these habitats are more condensed than bigger ecosystems on the mainland, they are frequently far more manageable places for research. Islands are also great settings because they allow scientists to examine ecosystems where new invasive species have just recently colonized and see how they propagate and alter the island. They can then apply their knowledge to similar, but more complex mainland environments. The biomes of islands vary greatly, ranging from tropical to cold. This diversity of environment enables the study of a large range of species in various regions of the world.

5.6 GLOSSARY

- **Biome:** A large-scale ecological community characterized by distinctive plant and animal species adapted to specific environmental conditions, such as climate and soil type.
- **Biodiversity:** The variety of living organisms found in a particular habitat or ecosystem, including species diversity, genetic diversity, and ecosystem diversity.
- **Tundra:** A biome characterized by low temperatures, short growing seasons, permafrost, and sparse vegetation consisting of mosses, lichens, and dwarf shrubs.
- **Taiga:** Also known as the boreal forest, the taiga biome is characterized by coniferous forests dominated by trees such as spruce, fir, and pine, adapted to cold climates and acidic soils.
- **Desertification:** The process by which fertile land becomes desert due to natural or human-induced factors such as climate change, deforestation, overgrazing, and soil erosion.
- **Tropical Rainforest:** A biome characterized by high temperatures, abundant rainfall, and lush vegetation consisting of tall trees, epiphytes, and diverse plant and animal species.
- **Savanna:** A tropical or subtropical biome characterized by a mix of grassland and scattered trees, adapted to seasonal rainfall patterns and periodic droughts.
- **Deciduous Forest:** A biome characterized by trees that shed their leaves seasonally, experiencing four distinct seasons with moderate temperatures and precipitation.
- **Chaparral:** A biome characterized by hot, dry summers and mild, wet winters, consisting of dense shrubs, small trees, and adaptations to wildfires and droughts.
- **Mediterranean Climate:** A climate characterized by mild, wet winters and hot, dry summers, typically found in regions bordering the Mediterranean Sea and other parts of the world with similar climatic conditions.

5.7 ANSWER TO THE CHECK YOUR PROGRESS

1. Which of the following is NOT considered one of the major bio-geographical regions of the world?

- a) Tropical Rainforest
- b) Tundra
- c) Savannah
- d) Desert

Answer: c) Savannah

2. The Taiga biome is primarily characterized by:

- a) Hot and humid climate
- b) Dense tropical rainforests
- c) Coniferous forests
- d) Sparse vegetation and extreme cold

Answer: c) Coniferous forests

3. The Mediterranean biome is known for its:

- a) Extensive grasslands
- b) Harsh desert conditions
- c) Mild, wet winters and hot, dry summers
- d) Continuous snow covers throughout the year

Answer: c) Mild, wet winters and hot, dry summers

4. Which biome is characterized by permafrost and low-growing vegetation?

- a) Grassland
- b) Desert
- c) Tundra
- d) Temperate Forest

Answer: c) Tundra

5. The Amazon Rainforest is an example of which bio-geographical region?

- a) Tropical Rainforest

- b) Desert
- c) Tundra
- d) Grassland

Answer: a) Tropical Rainforest

6. The Serengeti Plain, known for its vast grasslands and annual wildebeest migration, is located in:

- a) North America
- b) South America
- c) Africa
- d) Australia

Answer: c) Africa

7. Which biome is characterized by its extreme temperature variations between day and night?

- a) Desert
- b) Tropical Rainforest
- c) Tundra
- d) Temperate Grassland

Answer: a) Desert

8. The Chaparral biome is commonly found in regions with:

- a) Moderate temperatures and abundant rainfall
- b) Extremely cold temperatures and heavy snowfall
- c) Hot, dry summers and mild, wet winters
- d) High humidity and dense fog

Answer: c) Hot, dry summers and mild, wet winters

9. The Deciduous Forest biome is characterized by:

- a) Evergreen trees adapted to cold temperatures

- b) Trees that shed their leaves seasonally
- c) Sparse vegetation and rocky terrain
- d) Tall grasses and scattered shrubs

Answer: b) Trees that shed their leaves seasonally

10. Which bio-geographical region is characterized by its high species diversity and lush vegetation?

- a) Tundra
- b) Desert
- c) Tropical Rainforest
- d) Taiga

Answer: c) Tropical Rainforest

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5.9 TERMINAL QUESTIONS

1. Discuss the factors that contribute to the formation and distribution of different bio-geographical regions across the world. Provide examples to illustrate your points.

2. Describe the characteristics of the Tropical Rainforest biome. Explain why tropical rainforests are considered the most biodiversity ecosystems on Earth.
3. Compare and contrast the Tundra and Taiga biomes in terms of climate, vegetation, and animal life. Explain how these two biomes are adapted to their extreme environmental conditions.
4. Analyze the significance of grasslands in global ecosystems. Discuss the different types of grasslands and their distribution patterns across continents.
5. Explain the concept of desertification and its implications for arid and semi-arid regions. Discuss the causes of desertification and potential strategies for its prevention and mitigation.
6. Investigate the ecological importance of wetlands and coastal ecosystems. Discuss the threats facing these ecosystems and the measures taken to conserve and restore them.
7. Evaluate the impact of human activities, such as deforestation, urbanization, and agriculture, on global vegetation patterns and biodiversity. Discuss the consequences of habitat loss and fragmentation for plant and animal species.
8. Describe the characteristics of the Mediterranean biome and its ecological significance. Discuss the threats facing Mediterranean ecosystems and the conservation efforts aimed at protecting them.
9. Explore the relationship between climate change and shifts in vegetation distribution and composition. Provide examples of how changing climate conditions are affecting different biomes and ecosystems.
10. Analyze the role of protected areas, such as national parks and nature reserves, in conserving biodiversity and preserving natural habitats. Discuss the challenges associated with managing and maintaining these protected areas in the face of increasing human pressure and environmental degradation.

UNIT -6 POPULATION & CULTURAL REGIONS

6.1 OBJECTIVES

6.2 INTRODUCTION

6.3 CATEGORY OF CULTURAL REGIONS

6.4 BASES OF DELIMITATION OF CULTURAL REALMS

6.5 MAJOR CULTURAL REGIONS OF THE WORLD

6.6 SUMMARY

6.7 GLOSSARY

6.8 ANSWER TO THE CHECK YOUR PROGRESS

6.9 REFERENCES

6.10 TERMINAL QUESTIONS

6.1 OBJECTIVES

After reading this unit, you will be able to:

- Understanding the Category of Cultural Regions.
 - Learn about Bases of delimitation of cultural realms.
 - Gain knowledge about major cultural regions of the world.
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6.2 INTRODUCTION

A cultural realm is a type of cultural area or cultural region. A cultural region is a continuous geographical area characterized by cultural homogeneity. This concept is derived from cultural ecology, referring to the geographical region over which the cultural traits of a typical human group may be identified. Given the dependence of cultural homogeneity on immediate communication and the dependence of communication on geographic continuity or its technical substitutes, a "cultural area" implies relative uniformity rather than absolute uniformity. Relative cultural similarity appears in different degrees, from the virtual identity of attitudes and aptitudes within a small territory to general resemblance or wide dissemination of individual traits or elements of culture over large areas.

A culture area in geographic terms constitutes a region; it forms a definable spatial unit characterized by relative internal homogeneity. The typical association of concrete cultural features within a region, or in other spatial divisions of the earth, may be described as the cultural landscape. This cultural landscape is used for distinguishing and classifying cultural regions of different orders (Singh, L.R., 2003, p. 272).

In cultural geography, attention has commonly been focused on material culture as opposed to the social heritage of collective mental and spiritual products and forms of human conduct. Cultural systems comprise that huge mass of learned behaviour, attitudes, and ideas that control the greater part of their participants' thoughts and actions. The possible combinations are so numerous that no two individuals are identical; indeed, each constitutes a kind of cultural microorganism. At the other extreme, certain cultural practices are almost universal. Relying on such criteria, the entire human species might be regarded as sharing a cultural macro-region (Zelinsky, 1966, p. 66). Between the two extremes of macro-region and micro-region lies the meso-region, having a common heritage.

Thus, however, the cultural areas or cultural regions may be classified into three hierarchical categories as follows:

Accordingly, the hierarchy of cultural regions may be determined in terms of cultural worlds, cultural realms, and cultural regions. The cultural world encompasses a macro-region,

based on the most dominant cultural characteristics, examples include the European cultural world, the Dry cultural world, the African cultural world, the Oriental cultural world, the American cultural world etc. The cultural words may be divided into meso-cultural regions or cultural realms. For example, the European cultural world can be further subdivided into cultural realms (meso-cultural regions) like North-western European

Major Cultural Regions (Realms) of the Weid realm, Eastern European realm and Mediterranean realm. These cultural realms are further sub. divided into cultural regions (micro-regions) based on micro-level differentiations North-western European realm may be subdivided into 4 micro-regions (1) British Islands, (2) Scandinavian lands. (3) Low countries, and (4) German lands Scholars using the concept of cultural area/ region frequently sub-classified such areas into three contiguous zones: (i) core, (ii) domain, (iii) and realm.

(1) Core is the area over which the particular culture has exclusive or quasi-exclusive influence. It is the region of highest intensity.

(ii) Domain is the region over which its identifying traits are dominant but not exclusive (iii) Realm is the region over which such cultural traits may be found but are subdominant to those of other cultures.

6.3 CATEGORY OF CULTURAL REGION

I. Macro-region

II. Meso-region

III. Micro-region

Macro-region

A macro-region, in the context of geography and geopolitics, refers to a large geographical area encompassing multiple countries or territories that share common interests, challenges, and opportunities. Unlike traditional geopolitical boundaries defined by national borders, a macro-region transcends these boundaries and focuses on fostering cooperation, integration, and synergy among its constituent parts. The concept of macro-regions has gained prominence in recent decades as countries recognize the need for collaborative approaches to address complex regional issues and promote sustainable development.

One prominent example of a macro-region is the European Union (EU), which comprises 27 member states in Europe. The EU represents a significant political and economic bloc that

aims to promote peace, stability, and prosperity through integration and cooperation. Within the EU, countries work together on various fronts, including trade, investment, governance, and environmental protection, to achieve common goals and address shared challenges. The EU's macro-regional approach facilitates the pooling of resources, expertise, and decision-making powers, enabling member states to tackle issues that transcend national boundaries more effectively. This collective approach allows the EU to implement cohesive policies, enhance economic and social cohesion, and strengthen its global influence.

Another example of a macro-region is the Asia-Pacific region, which encompasses countries around the Pacific Ocean, including East Asia, Southeast Asia, and Oceania. The Asia-Pacific region is characterized by its diverse cultures, economies, and geopolitical dynamics, as well as its strategic importance in global trade and security. Countries in the Asia-Pacific have increasingly recognized the need for enhanced regional cooperation to address common challenges such as economic development, maritime security, and environmental sustainability. Initiatives such as the Asia-Pacific Economic Cooperation (APEC) forum and the Association of Southeast Asian Nations (ASEAN) promote dialogue, cooperation, and integration among countries in the region to foster peace, stability, and prosperity. These organizations facilitate collaboration on economic policies, trade agreements, and security measures, helping to manage the complex interdependencies and shared interests within the macro-region.

A meso-region is a geographic concept that lies between the micro and macro levels, representing an intermediate scale of analysis within a larger geographical context. Unlike micro-regions, which focus on local areas such as cities or small districts, and macro-regions, which encompass large territories or countries, meso-regions typically consist of clusters of smaller localities or administrative units that share common characteristics, resources, and development challenges. These meso-regions often play a significant role in shaping regional dynamics and are increasingly recognized as important units of analysis in geographical and developmental studies.

Meso-regions can vary widely in size, scope, and composition, depending on factors such as geographic features, historical development patterns, and socio-economic dynamics. Examples of meso-regions include river basins, coastal zones, mountain ranges, and economic corridors, which encompass multiple localities or municipalities linked by common economic activities, transportation networks, or environmental features. These meso-regions often serve as important nodes of interaction, exchange, and cooperation, facilitating the flow of goods, services, and ideas within broader regional contexts.

One example of a meso-region is the Greater Mekong Subregion (GMS) in Southeast Asia, which comprises six countries—Cambodia, China, Laos, Myanmar, Thailand, and Vietnam—linked by the Mekong River basin. The GMS is characterized by its rich natural resources, diverse cultures, and rapid economic development, with countries in the region collaborating on

various initiatives to promote infrastructure connectivity, trade facilitation, and sustainable development. The GMS exemplifies how meso-regional cooperation can help address common challenges such as poverty alleviation, environmental conservation, and regional integration, while harnessing the potential of shared resources and opportunities for mutual benefit.

Meso-Region

A meso-region represents an intermediate scale of analysis within a broader geographical context, situated between micro and macro levels. Unlike micro-regions, which concentrate on specific localities like cities or small districts, and macro-regions, which encompass extensive territories or entire countries, meso-regions typically comprise clusters of smaller localities or administrative units sharing common characteristics, resources, and development challenges. These meso-regions play a significant role in shaping regional dynamics and are increasingly acknowledged as crucial units of analysis in geographical and developmental studies.

Meso-regions exhibit considerable variation in size, scope, and composition, influenced by factors like geographic features, historical development patterns, and socio-economic dynamics. Illustrative meso-regions comprise river basins, coastal zones, mountain ranges, and economic corridors, integrating multiple localities or municipalities through shared economic activities, transportation networks, or environmental characteristics. These meso-regions function as vital hubs for interaction, exchange, and collaboration, fostering the movement of goods, services, and ideas within broader regional frameworks.

An instance of a meso-region is the Greater Mekong Subregion (GMS) in Southeast Asia, encompassing six countries—Cambodia, China, Laos, Myanmar, Thailand, and Vietnam—connected by the Mekong River basin. The GMS stands out for its abundant natural resources, diverse cultures, and swift economic growth, with regional nations collaborating on initiatives to bolster infrastructure connectivity, streamline trade, and foster sustainable development. This region showcases how meso-regional collaboration can tackle shared challenges like poverty reduction, environmental preservation, and regional cohesion, leveraging shared resources and opportunities for mutual advancement.

Micro-Region

A micro-region denotes a compact, localized area within a broader geographical setting, typically distinguished by specific physical, economic, social, or cultural attributes. Such regions frequently showcase distinctive features that differentiate them from their neighbouring areas, rendering them noteworthy subjects for geographical and developmental analysis.

Physically, micro-regions can be delineated by particular environmental characteristics like mountain ranges, river basins, or coastal zones. For instance, a micro-region situated amidst mountainous terrain might boast its microclimate, exceptional biodiversity, and specific land

utilization distinct from nearby lowland regions. Similarly, a micro-region along a coast could experience maritime climates, coastal ecosystems, and specialized economic pursuits like fishing or tourism.

From an economic standpoint, micro-regions frequently harbour specialized industries, economic hubs, or natural assets that propel local growth. These might encompass agricultural zones renowned for specific crops or livestock breeds, industrial clusters specializing in particular manufacturing processes, or resource-abundant regions concentrating on mining, forestry, or energy extraction. The economic dynamism of micro-regions often hinges on their geographic resources and competitive edges, influencing local livelihoods and economic tactics.

6.4 BASES OF DELIMITATION OF CULTURAL REALMS

In cultural geography, the focus has traditionally leaned towards material culture rather than the social legacy of collective mental and spiritual products and human behaviours. Esteemed human geographers like Carl Sauer have acknowledged that the economy of a human group is culturally embedded. Recent efforts have aimed at formulating a theory of culture as material production within critical human geography. Cultural elements encompass religion, language, way of life, tradition, settlement patterns, economic systems (agriculture, industry, trade, services, etc.), political systems, social organization, cuisine, clothing, art, music, and entertainment. Due to the challenge of gathering information and data on abstract elements, material culture receives significant attention. Many contemporary human geographers argue that, for practical purposes, the attributes studied by human or cultural geographers should be limited to those characteristics included in census enumeration schedules, especially in the vital registration systems of advanced countries.

The delimitation of cultural realms around the world primarily considers macro spatial elements of culture while avoiding microelements or traits. Therefore, in delineating cultural realms, factors such as attitude and way of life, religious beliefs, language, racial groups, technological development, etc., are vital tools. A cultural realm may be defined by a single characteristic or by the combination of multiple factors. The following are the bases commonly used in delimiting cultural realms:

(1) Attitude and Way of Life: Attitude represents a state of mind, involving a relatively enduring predisposition to feel, perceive, or behave towards certain individuals or phenomena in a specific manner. People's attitudes play a pivotal role in perception, influencing preferences and goal selection. The collective mental and spiritual expressions (including aesthetic perception, beliefs, ideas, symbols, and values), behavioural forms, social structures, and artistic manifestations are all shaped by the inhabitants of a region according to their living conditions (way of life), thus characterizing a distinct society. The societal way of life is passed down as a

social heritage from one generation to the next, undergoing significant modifications and adaptations along the way.

The way of life, or lifestyle, is influenced by various factors, including the physical and social environment. For instance, the lifestyle in cold tundra regions differs significantly from that in other climatic zones such as equatorial regions, monsoon areas, hot deserts, and temperate grasslands. Tribal communities in the tundra region (like Eskimos, Lapps, Tungus, Chukchis, and Yakuts) have developed unique ways of living adapted to the cold climate. Similarly, temperate grasslands have historically been utilized for animal grazing and breeding, with nomadic herding still prevalent in many parts of Central Asia.

The scarcity of water and vegetation in deserts and arid lands negatively impacts the fauna in these regions. Such challenging environmental conditions greatly influence the economy and society. Many tribes in arid regions rely on hunting and gathering economies, while others practice nomadic herding.

In terms of global cultural divisions, some economists and scholars divide the world into two major parts: (1) the Occidental or Western cultural world, and (2) the Oriental or Eastern cultural world. Western culture, dominant in Europe, North and South America, and Australia, is often characterized by materialism. In contrast, Eastern culture, prevalent in South, Southeast, and East Asia, is rooted in spiritual thinking and human values. Religion also plays a crucial role in shaping lifestyles and societies.

Cultural elements serve as potent tools in delineating the cultural realms of the world. As noted by Singh (2003), fundamental notions such as environmental ethics, the harmonious relationship between humanity and nature, symbolism, and perceptions are translated into belief systems within religious ecology. Presently, major religions worldwide include Christianity, Islam, Hinduism, Buddhism, and Chinese folk religion.

Christianity largely dominates the cultural realms of Europe, North America, South America, and Australia. The Islamic faith encompasses vast territories across northern Africa, Southwest Asia, and Central Asia, with countries like Pakistan, Bangladesh, and Indonesia having significant Muslim populations. India also hosts a sizable Muslim community. Buddhism, originating in India, has spread to Southeast Asia and East Asia. Meanwhile, approximately 80% of the world's Hindu population resides in the Indian subcontinent, notably in India, Nepal, Bhutan, and Sri Lanka.

The cultural boundaries of the predominantly Muslim realm are primarily delineated by the dominance of Islam, stretching from the Atlantic Ocean in the west to Central Asia in the northeast.

(2) Language: Language serves as a primary vehicle for cultural diffusion, both spatially and temporally. It is a lasting cultural form that facilitates cultural adaptation and historical transformation. This is why geographers often use language as a key identifier of different cultures. Given its role in communication and politics, language influences the socio-economic and politico-cultural institutions within any given society. Consequently, economic, religious, and political systems often align with patterns of language distribution. Thus, human linguistic patterns create a highly intricate mosaic that both influences and is influenced by various cultural and environmental elements.

Based on language differences, the American Cultural World (encompassing North and South America) is divided into two cultural realms: Anglo-America and Latin America. Anglo-America comprises the United States of America and Canada, where English is the dominant and official language. Latin America includes Mexico, Central America, and the entirety of South America, where languages from the Latin linguistic family (such as Spanish, Portuguese, and French) prevail. Similarly, just as cultural realms are demarcated by linguistic boundaries, smaller cultural areas can also be delineated similarly. For instance, the division of Indian states is often based on predominant regional languages.

(3) Racial Group: The concept of the human race holds validity as a biological category, denoting a distinct genetic lineage or subspecies, comprised of individuals united by heredity. Various racial groups are distributed across different regions of the world, each characterized by permanent physical traits such as skin colour, stature, cranial measurements, nasal structure, and hair morphology, which, once differentiated, persist through generations despite intermixing.

The major racial groups include Negroid (comprising Negroes and Negritoes), Australoid, Caucasoid (including Mediterranean, Alpine, and Nordic), and Mongoloid (Mongolian). In the demarcation of cultural realms, racial grouping is considered a useful criterion. For instance, Africa south of the Sahara desert is classified as the Negro African realm (or Black Africa realm) due to its predominantly black Negroid population.

Central and East Asia are inhabited primarily by Mongolian peoples. Western Asia, North Africa, and Europe are predominantly occupied by the Caucasian race. In Europe, the Nordic race is concentrated mainly around the Baltic and North Seas, while the Mediterranean races inhabit southern Europe, particularly the Mediterranean coast. The Alpine races are situated between the Nordic populations in the north and the Mediterranean populations in the south.

(4) Level of Technological and Economic Development: Technology encompasses the practical arts and sciences, focusing on the systematic application of scientific knowledge not only to industrial processes but also to address challenges arising from human-environment interactions. In prehistorical or pre-industrial contexts, technology refers to the knowledge and practices developed for crafting tools and other artefacts, as well as for extracting and collecting

necessary materials. The portion of the physical environment shaped or altered by human activity is termed the technosphere or cultural landscape.

The advancement of technology is intricately linked with human and economic progress. Countries worldwide are categorized into three groups: developed countries, developing countries, and least developed countries. In the European Cultural World, the classification is delineated into Cultural Worlds, Realms, and Sectors as presented in Table 3.1.

6.5 MAJOR CULTURAL REGIONS (REALMS) OF THE WORLD

1. Europe
2. Russia
3. North America
4. Middle and South America
5. Sub-Saharan Africa
6. North Africa and Southeast Asia
7. South Asia
8. East and Southeast
9. Oceania

EUROPE

Europe's physical geography, climate, and available resources have significantly influenced the distribution of populations across the continent. Early human settlers likely migrated through the Caucasus Mountains in Southwest Asia and across the Bosphorus Strait from present-day Turkey into Greece. The Greeks played a pivotal role in shaping the cultural and political foundations of modern European society. Their ideals of democracy, humanism, and rationalism resurfaced during the Age of Enlightenment, exerting a profound influence on The Roman Empire's extensive dominion over Europe and Southwest Asia played a crucial role in unifying the region under Christianity and establishing new networks of roads and trading ports. However, with the collapse of the Roman Empire, tribal and ethnic loyalties resurged, leading to numerous invasions and migrations. For instance, England was settled first by the Germanic Anglo-Saxons, from whom the name "England" or "Angeln" is derived, and later by the Normans from present-day France.

Despite Europe being composed of 40 countries today, historically, it was characterized by kingdoms and empires, even in more recent times. A map of Europe from just two centuries ago presents a stark contrast to today's political boundaries. During that period, Greece and Turkey remained under the control of the Ottoman Empire, and Italy was a patchwork of various city-states and independent kingdoms. Many of the contemporary countries and political borders in Europe emerged only after World War II.

Europe's population has undergone significant shifts and transformations over time. While Europe was historically characterized by feudal and agrarian societies, today approximately 75 percent of its population resides in urban areas. London stands as Europe's largest city, boasting a population of around 8.5 million within its city limits. Although the United Kingdom once held significant sway in Europe during the industrialization era, Germany has now emerged as the dominant force in terms of population, gross domestic product (GDP), and territorial size.

The political landscape of Europe remains dynamic, marked by shifting alliances, competing objectives, and renewed calls for independence. Generally, Western Europe has trended towards cooperation. The European Union (EU) originated from the Benelux Economic Union established in 1944 among Belgium, the Netherlands, and Luxembourg. Subsequently, France, Italy, and West Germany signed an economic pact with the Benelux states in 1957, leading to further expansion of economic cooperation.

Formally established in 1993, the European Union comprises 28 member countries. While not all EU members utilize the euro as their official currency, the 19 states that do are collectively referred to as the eurozone.

The Industrial and Agricultural Revolutions significantly influenced migration patterns within Europe and immigration to the region. Migration, defined as a permanent move from one place to another, encompasses both intraregional migration (movement within a specific region) and interregional migration (such as migration from Europe to North America). Geographers studying migration analyze the push and pull factors that drive people to relocate. Push factors compel individuals to leave their current location, such as a lack of job opportunities, environmental hazards, or political unrest. Pull factors attract individuals to new locations, including job availability, freedom from persecution, or desirable amenities.

Historically, intraregional migration in Europe was predominantly rural to urban, as individuals migrated from agricultural areas to cities in search of employment opportunities. Cities burgeoned rapidly in the region, emerging as hubs of trade and industry due to the influx of migrants.

Before the Industrial Revolution, migration to Europe primarily occurred through invasions by empires such as the Roman Empire, the Islamic Empire, and the Ottoman Empire. One significant historical migration, not associated with invading empires, was the Jewish diaspora following the conquest of Judea (now Israel and Palestine) by various groups including the Assyrians, Babylonians, and Romans. The diaspora refers to the dispersion of a group of

people from their homeland, and many Jews migrated to Europe to escape persecution, especially after the destruction of the Second Temple in Jerusalem in 70 CE.

However, European Jews often faced anti-Semitic discrimination. During the Middle Ages, they were frequently attacked and expelled from countries like England and France. The mid-14th century Black Death pandemic led to further persecution, falsely blamed on Jews, resulting in their massacre and expulsion from various European communities. European Jews were also confined to ghettos, segregated neighbourhoods often met with suspicion and hostility from Christians.

The persecution of Jews reached its peak during the Nazi Party's rule in Germany, culminating in the Holocaust, which targeted Jews and other marginalized groups. After World War II, many surviving Jews migrated to Israel. Today, approximately 2.4 million Jews reside in Europe.

The secularization of Western Europe has intensified debates over immigration, particularly as the region has seen an increase in Muslim immigrants from North Africa and Southwest Asia. Muslims, who have higher fertility rates, are expected to grow as a percentage of Europe's population. This demographic shift has sparked divisions among Europeans regarding immigration policies and treatment of asylum seekers.

The Syrian civil war intensified migration to Europe in 2014 and 2015, with Germany receiving the most asylum applications. These demographic changes and migration patterns have underscored deep-seated divisions within European societies over national identity and the region's role in global affairs. Despite these challenges, Europe remains an influential and economically significant region, likely to continue attracting migrants from neighbouring areas in the future.

RUSSIA

Russia's vast size and diverse physiographic regions present challenges for its population. Much of the country is too cold for widespread human settlement, limiting the area suitable for agriculture and intensive development. In Russia's northern regions, short growing seasons and frequent droughts impede agricultural development, while erosion caused by melting snow exacerbates the challenges.

Despite these obstacles, some settlements have been established in these harsh environments. Oymyakon, located in northeastern Russia, holds the record for being the coldest permanently inhabited place on Earth, with temperatures plummeting to -71.2°C (-96°F). However, such extreme conditions hinder industrial development in Siberia, which accounts for over three-quarters of Russia's land area but contains only one-quarter of its population. A sparse population makes building infrastructure and transporting resources to industrial areas challenging, requiring specialized facilities to cope with the cold climate and frozen soil.

Russia's population has experienced fluctuations over the years, with a peak in the early 1990s followed by a rapid decline. Economic downturns coinciding with the dissolution of the Soviet Union contributed to low birth rates. However, recent efforts to encourage immigration and higher birth rates have stabilized population growth.

Despite being highly urbanized, Russia faces health challenges such as high death rates, particularly due to alcoholism and cardiovascular diseases. Additionally, there's a notable trend of people moving from crowded cities to rural areas, contrary to global rural-to-urban migration patterns.

Ethnicity plays a significant role in Russia's history and identity. Before the Bolshevik Revolution, the Russian Empire enforced Russification policies, aiming to assimilate non-Russian communities into Russian culture and language. Under the Soviet Union, the policy shifted towards Sovietization, with varying degrees of autonomy granted to ethnic regions.

Today, Russia remains ethnically diverse, with over 185 ethnic groups speaking over 100 languages. However, tensions exist between minority groups and the Russian government, particularly in regions like the Caucasus, where ethnic groups seek independence. Managing this diversity while maintaining territorial integrity remains a challenge for Russia.

NORTH AMERICA

The history of North America is deeply intertwined with the interactions between indigenous peoples and European colonizers. Long before Christopher Columbus's arrival, indigenous peoples inhabited the continent, likely migrating from Asia via the Beringia land bridge. These diverse indigenous groups practised various lifestyles, including hunting and gathering and settled agriculture, and they numbered around 50 million before European contact.

European colonization, beginning with Columbus's arrival in the late 15th century, dramatically altered North America's cultural landscape. Spanish and Portuguese colonization followed, leading to the displacement and relocation of indigenous peoples. European settlers

brought diseases like smallpox, measles, and cholera, causing devastating impacts on indigenous populations, with up to 90 percent dying in some areas.

By the early 1700s, France, the United Kingdom, and Spain established colonies in North America. The British colonies, including the thirteen colonies that later formed the United States, primarily developed along the eastern coast. The French focused on fur trading and established settlements in present-day Canada and the Mississippi River region, while the Spanish colonized areas like Florida and Middle America for resources and to spread Catholicism.

The colonial period saw the introduction of slavery, particularly in the southern United States, where enslaved Africans worked in agriculture. Slavery persisted until the mid-19th century, despite Britain formally abolishing it in 1833. The issue of slavery played a significant role in the American Civil War, reflecting deeply entrenched economic and social structures.

Industrialization and urbanization shaped North America's landscape, with settlements initially concentrated along the eastern coast and expanding westward. Immigration and natural population growth fueled North America's population increase over the centuries, with the United States and Canada now highly urbanized nations.

Major cities like Toronto and Washington, DC, have experienced significant urban sprawl, leading to metropolitan areas overlapping and forming megalopolises like the Northeast Megalopolis. These urban centres offer opportunities for innovative housing and transportation planning but also present challenges like income inequality.

While both Canada and the United States have relatively strong economies, income inequality persists, with poverty rates higher in certain regions, particularly in the southern United States. Canada generally has stronger social welfare programs than the United States, including universal healthcare and income support for those in extreme poverty.

MIDDLE AND SOUTH AMERICA

Middle America, situated between North and South America, encompasses Mexico, Central America, and the Caribbean islands. This region shares strong cultural and historical ties, with indigenous groups forming early civilizations like the Maya and the Aztecs, whose legacies continue to influence the cultural landscape.

The Maya Civilization, originating around 2000 BCE, flourished across present-day Honduras, Guatemala, Belize, and the Yucatan peninsula. Known for their advanced theocratic society, hieroglyphic script, calendar, mathematics, and astronomy, the Maya built monumental architecture like the iconic pyramids of Chichen Itza.

In South America, diverse indigenous groups settled in various environments before European colonization. The Inca Empire, established in Peru in the 13th century, became the largest pre-Columbian civilization, spanning four territories and over 2,500 miles.

Spain and Portugal colonized much of the Americas after the Treaty of Tordesillas in 1494, dividing territory between the two empires. Spanish conquistadors, led by Francisco Pizarro, conquered the Inca Empire, while Portugal claimed eastern South America, including present-day Brazil.

Coastal South America saw colonization by France, the Netherlands, and the United Kingdom, with colonies focused on plantation economies and slave labour. European colonial powers prospered, exploiting resources and establishing lucrative trade networks.

Colonization transformed the urban and rural landscapes, with little regard for indigenous populations or local development. Spanish colonies adhered to urban planning guidelines outlined in the Laws of the Indies, resulting in cities resembling European counterparts.

Independence movements swept across Middle and South America in the early 19th century, leading to the formation of independent states. While most of the mainland gained independence, some Caribbean islands remained under European control.

Migration from Middle and South America reflects global economic connectivity, with many migrants seeking better opportunities abroad. Brain drain, where skilled workers emigrate, contributes to remittances sent back home, representing a significant portion of some countries' GDP.

In summary, Middle and South America's history is marked by indigenous civilizations, European colonization, and struggles for independence, shaping the region's cultural and economic landscapes.

SUB-SAHARAN AFRICA

Africa's rich history spans millennia, with early human habitation leading to diverse cultural and linguistic groups. Settlements date back to around 16,000 BCE in present-day Ethiopia, evolving from gathering to settled agriculture around 10,000 years ago.

In pre-colonial Africa, women played crucial roles as primary agriculturalists and caretakers, with societies often centred around female deities. Land ownership and inheritance differed from European norms, with land passed down through partible inheritance, preventing the formation of a landed aristocracy.

Family units formed the basic social structure, while extended families held political significance, organizing into tribes and controlling distinct territories. Africa was also home to several large empires like Kush, Aksum, and Ghana, boasting advanced civilizations with trade routes and monumental architecture.

Today, Sub-Saharan Africa comprises 48 independent countries and 800 million people. While colonialism reshaped politics and economics, rural life remains prevalent, with only a

third living in cities. Urbanization is increasing, driven by government investments in industry and economic development, notably in Nigeria.

Population growth is rapid, with Sub-Saharan Africa having the highest fertility rates globally. Nigeria's population is projected to surpass that of the United States by 2050. Healthcare remains a significant challenge, with imbalances in availability and quality of care exacerbated by endemic diseases and post-colonial governance issues.

Foreign aid efforts are often met with suspicion, and some aid intended for the region's poorest populations has been misappropriated by corrupt governments. Endemic diseases, like hepatitis and hookworm, persist, while outbreaks of diseases like Ebola highlight the region's healthcare challenges.

In summary, Africa's history is characterized by diverse cultures, ancient civilizations, and contemporary challenges, including rapid population growth and healthcare disparities.

NORTH AFRICA AND SOUTHWEST ASIA

The climate and physical geography of North Africa and Southwest Asia have profoundly influenced population patterns and cultural developments in the region. Settlements have historically clustered around scarce water resources, notably in regions such as the Nile River valley, the coastal Mediterranean, the river basins of the Euphrates and Tigris, and the valleys of northwestern Iran.

Over 10,000 years ago, early humans settled in the Fertile Crescent, where they pioneered agriculture and urban civilization. Mesopotamia, situated between the Tigris and Euphrates rivers, witnessed significant innovations like the invention of the wheel and the development of the first urban centre, Sumer. Cities like Uruk and Babylon flourished, boasting large populations and monumental structures.

Local adaptations to the arid climate include architectural features like high roofs and shaded courtyards, while traditional dress often protects from the sun and sand. Some cultural groups, like the Berbers, historically practised seasonal migration to cooler areas, although modern changes and political boundaries have disrupted these traditional lifestyles.

The discovery of oil in the early 20th century transformed the economic landscape of the region, bringing both prosperity and challenges. North Africa and Southwest Asia are also significant religious centres, serving as the cradle of major world religions like Judaism, Christianity, and Islam.

Judaism, the oldest Abrahamic faith, emphasizes monotheism and traces its origins to Abraham's covenant with God. Christianity emerged from the teachings of Jesus, emphasizing love and compassion. Islam, the predominant religion in the region, teaches monotheism and views Muhammad as the final prophet, building upon the teachings of Judaism and Christianity.

Muhammad, born in Mecca in 570 CE, received revelations from God and began preaching in his community, eventually leading to the establishment of Islam. The Qur'an, Islam's holiest text, contains the revelations received by Muhammad and serves as a central guide for Muslim beliefs and practices.

Overall, the physical geography and historical developments of North Africa and Southwest Asia have shaped the region's cultural, economic, and religious landscapes, influencing population patterns and societal structures.

SOUTH ASIA

South Asia's rich cultural tapestry is a product of its diverse physical environment and millennia of human settlement. Early humans first arrived in the region around 75,000 years ago, with significant civilizations emerging later, notably the Indus Valley civilization around 3300 BCE. This civilization, located in present-day Pakistan, Afghanistan, and northwestern India, developed sophisticated urban planning and infrastructure, supported by the monsoon rains.

However, around 1800 BCE, the decline of the Indus Valley civilization began, likely due to weakened monsoon rains leading to drought conditions. This prompted migrations to other parts of the region. Around 1500 BCE, the Aryans, an Indo-Iranian group, invaded northern India, bringing their language, Sanskrit, and cultural practices, including the caste system.

South Asia has been shaped by various empires, such as the Maurya Empire and Islamic dynasties, each leaving an imprint on the cultural landscape. The region's ethnic diversity is reflected in its linguistic landscape, with Indo-European languages dominating the north, Sino-Tibetan languages along the Himalayas, and Dravidian languages in the south.

South Asia is a cradle of major world religions, with Hinduism emerging from Vedism, Buddhism from Hinduism, and Sikhism blending elements of Hinduism and Islam. Hinduism, with over 1 billion followers, is characterized by its polytheistic nature and central tenets of dharma, karma, reincarnation, and worship. Buddhism, founded by Siddhartha Gautama, emphasizes the Middle Way to end suffering, while Sikhism, founded by Guru Nanak, is monotheistic and emphasizes community service.

South Asia is the most populous region globally, with India alone exceeding 1.3 billion people. Geographers study populations using concepts like arithmetic and physiologic density, which provide insights into population concentration and distribution. These measures help compare population dynamics across different countries, considering factors like arable land availability and settlement patterns.

EAST AND SOUTHEAST ASIA East and Southeast Asia are regions of immense population, cultural diversity, and historical significance. The history of human settlement in these areas dates back

tens of thousands of years, with China serving as a focal point for early civilizations. China's Neolithic Period witnessed significant advancements in technology, including the domestication of plants and animals and the emergence of farming communities along the Yangtze River.

During the Ice Age, coastal migrations from East Asia to Southeast Asia occurred, facilitated by lower sea levels. This period also saw the peopling of Japan and the movement of cultural groups to Australia and surrounding islands.

China's dynastic rule, particularly under the Han dynasty, marked a golden age in its history, characterized by stability, trade expansion, and the proliferation of Confucianism as the state religion. Confucianism emphasized human relationships and education, shaping Chinese culture for centuries.

Southeast Asia's settlement patterns are influenced by historical, cultural, and environmental factors. River valleys and deltas, such as those of the Mekong and Irrawaddy rivers, attract high population densities. Urbanization, though slower compared to other regions, is on the rise, with cities like Jakarta, Bangkok, and Manila experiencing rapid growth fueled by rural-urban migration.

Agricultural practices, including shifting cultivation and wet-rice cultivation, shape rural settlement patterns. Population resettlement programs in countries like Indonesia, Malaysia, and Vietnam aim to provide agricultural employment and access to land, though they face challenges such as environmental degradation and land conflicts.

Southeast Asia's population is ethnically diverse, with various ethnic groups tracing their origins to different migration waves. Language patterns are complex, and rooted in four major language families: Sino-Tibetan, Tai, Austro-Asiatic, and Austronesian. Dominant languages vary by country, but efforts to promote national languages are evident.

Religions practised in Southeast Asia include Buddhism, Islam, Christianity, and Hinduism, with Islam predominant in parts of the Malay Peninsula and the Malay Archipelago. Christianity was introduced by European colonizers, particularly Spanish and Portuguese missionaries, and is significant in countries like the Philippines and southern Vietnam.

Population dynamics in Southeast Asia are influenced by fertility rates, mortality rates, and migration patterns. While some countries experience high population growth, others have implemented successful family planning programs to manage population growth. Internal and external migration, including rural-to-urban and seasonal migration, are key drivers of population change, along with refugee movements spurred by conflicts and persecution.

OCEANIA

Oceania, encompassing Australia, the Pacific Islands, and the polar regions, is a unique realm characterized by its isolation and diverse landscapes. Australia, as both a sovereign state and a continent, dominates the region in terms of size, economy, and population. Its geological stability and limited relief contrast with its Eastern coast's Great Dividing Range, influencing climate patterns and population distribution.

Ownership of oceanic resources has historically been ambiguous, with coastal states claiming jurisdiction over immediate coastlines, but the vast high seas remaining unowned. In Antarctica, although several countries claim territories, there is no permanent human population. Instead, the continent serves as a hub for scientific research, hosting research stations and supporting marine wildlife.

Human settlement in Oceania dates back tens of thousands of years, with Aboriginal Australians arriving between 40,000 and 50,000 years ago. Gradual settlement of the Pacific Islands followed, with Polynesia's more remote islands populated later due to their distance from other landmasses. European arrival in the late 18th century brought significant changes, with British colonization impacting Aboriginal Australians and Maori in Australia and New Zealand, respectively.

The British established Australia as a penal colony, leading to significant demographic changes and conflicts with Indigenous Australians. Disease epidemics, such as smallpox and measles, devastated Indigenous populations. Similarly, in New Zealand, the signing of the Treaty of Waitangi granted British sovereignty while recognizing Maori rights to land and resources, though tensions persisted.

Overall, Oceania's history reflects a complex interplay of human migration, colonization, and cultural interactions against a backdrop of unique geological and environmental features.

6.6 SUMMARY

Cultural regions around the world are defined by a complex interplay of shared traditions, beliefs, languages, customs, and histories that distinguish one group of people from another. These regions transcend political boundaries, often encompassing territories that may belong to multiple nations. For example, Europe is culturally diverse, with distinct regions like Scandinavia, the Mediterranean, and Eastern Europe, each characterized by unique languages, cuisines, and social practices. Similarly, Asia boasts a rich tapestry of cultural regions, from the Indian subcontinent with its myriad languages and religions to East Asia with its Confucian traditions and culinary diversity. In Africa, cultural regions are shaped by ethnic groups, linguistic diversity, and historical legacies, with regions like West Africa known for its vibrant music and dance traditions, and North Africa for its Arab and Berber influences. The Americas exhibit a wide array of cultural regions, from the indigenous cultures of the Andes to the Afro-Caribbean heritage of the Caribbean islands. These cultural regions are not static; they evolve

through interactions with neighbouring cultures, migration, globalization, and historical events. Despite their diversity, cultural regions serve as vital markers of identity, fostering a sense of belonging and shared heritage among communities across the globe.

6.7 GLOSSARY

- **Scandinavia:** A cultural region in Northern Europe encompassing countries such as Sweden, Norway, Denmark, and Finland, known for its Nordic languages, Viking heritage, and social welfare systems.
- **Mediterranean:** Refers to the cultural region surrounding the Mediterranean Sea, including Southern Europe, North Africa, and the Middle East, characterized by shared culinary traditions, Mediterranean climates, and historical influences from ancient civilizations.
- **Indian Subcontinent:** Cultural region comprising India, Pakistan, Bangladesh, Nepal, Bhutan, and Sri Lanka, known for its diverse languages, religions (Hinduism, Islam, Buddhism), and rich cultural heritage spanning thousands of years.
- **East Asia:** Encompasses countries such as China, Japan, South Korea, North Korea, and Taiwan, characterized by Confucian traditions, East Asian languages (Chinese, Japanese, Korean), and distinct culinary styles.
- **West Africa:** Cultural region in Africa comprising countries along the western coast, known for its ethnic diversity, vibrant music and dance traditions (such as Afrobeat), and historical empires like the Ghana Empire and Mali Empire.
- **North Africa:** Region comprising countries like Egypt, Morocco, Algeria, Tunisia, and Libya, influenced by Arab, Berber, and Mediterranean cultures, with Arabic and Berber languages predominant.
- **Andean Region:** Cultural region in South America encompassing the Andes mountain range, including countries like Peru, Bolivia, Ecuador, and parts of Colombia and Chile, known for its indigenous cultures, Inca heritage, and Andean music and dance traditions.
- **Caribbean:** Cultural region consisting of the Caribbean Sea and its islands, including Cuba, Jamaica, Haiti, the Dominican Republic, and many others, characterized by Afro-Caribbean cultures, reggae music, and vibrant culinary traditions influenced by African, Indigenous, and European cuisines.
- **Pacific Islands:** Refers to the cultural region encompassing the islands of the Pacific Ocean, including Polynesia, Melanesia, and Micronesia, known for their diverse indigenous cultures, languages, and traditions, such as hula in Hawaii and Maori culture in New Zealand.
- **Arab World:** Cultural region spanning the Middle East and North Africa, characterized by shared Arabic language, Islamic heritage, and cultural traditions, including calligraphy, architecture, and hospitality customs.

6.8 ANSWER TO THE CHECK YOUR PROGRESS

1. Which region is known for its Nordic languages, Viking heritage, and social welfare systems?

- a) Indian Subcontinent
- b) Scandinavia
- c) East Asia
- d) Caribbean

Answer: b) Scandinavia

2. Where can the cultural region of the Mediterranean be found?

- a) North America
- b) South America
- c) Southern Europe, North Africa, and the Middle East
- d) East Asia

Answer: c) Southern Europe, North Africa, and the Middle East

3. Which area is characterized by diverse languages, religions (Hinduism, Islam, Buddhism), and rich cultural heritage spanning thousands of years?

- a) North Africa
- b) East Asia
- c) Indian Subcontinent
- d) Caribbean

Answer: c) Indian Subcontinent

4. What region is known for its Confucian traditions, East Asian languages (Chinese, Japanese, Korean), and distinct culinary styles?

- a) Indian Subcontinent
- b) Mediterranean

- c) East Asia
- d) Andean Region

Answer: c) East Asia

5. Which region is renowned for its vibrant music and dance traditions such as Afrobeat?

- a) Andean Region
- b) North Africa
- c) West Africa
- d) Pacific Islands

Answer: c) West Africa

6. Where can the cultural region influenced by Arab, Berber, and Mediterranean cultures be found?

- a) Andean Region
- b) Caribbean
- c) North Africa
- d) Pacific Islands

Answer: c) North Africa

7. Which region is characterized by indigenous cultures, Inca heritage, and Andean music and dance traditions?

- a) Caribbean
- b) East Asia
- c) Andean Region
- d) Indian Subcontinent

Answer: c) Andean Region

8. Which area is known for its Afro-Caribbean cultures, reggae music, and vibrant culinary traditions?

- a) Indian Subcontinent

- b) Mediterranean
- c) Caribbean
- d) Scandinavia

Answer: c) Caribbean

9. Where can the cultural region encompassing Polynesia, Melanesia, and Micronesia be found?

- a) Indian Subcontinent
- b) East Asia
- c) Caribbean
- d) Pacific Islands

Answer: d) Pacific Islands

10. What cultural region is characterized by shared Arabic language, Islamic heritage, and cultural traditions?

- a) North Africa
- b) the Caribbean
- c) the Indian Subcontinent
- d) Arab World

Answer: d) Arab World

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6.10 TERMINAL QUESTIONS

1. What are the defining cultural characteristics of Europe, and how have historical events shaped its diverse cultural landscape?
2. How does Russia's vast geographical expanse contribute to the diversity of its cultural regions, and what are some key cultural distinctions between its western and eastern territories?
3. What cultural similarities and differences exist among the countries of North America, and how have indigenous cultures influenced the region's contemporary cultural identity?
4. How do the cultural regions of Middle and South America reflect the legacies of pre-Columbian civilizations, colonialism, and modern globalization?
5. In what ways does sub-Saharan Africa's cultural diversity manifest across its various regions, and how do factors such as ethnicity, language, and religion contribute to this diversity?
6. What are the cultural commonalities and distinctiveness of South Asia's diverse regions, including the Indian subcontinent, the Himalayan region, and the Indian Ocean littoral?
7. How do the cultural regions of East and Southeast Asia reflect the interplay of indigenous traditions, Confucian values, and external influences such as Buddhism and Islam?
8. What cultural similarities and differences exist among the diverse nations and territories of Oceania, including Australia, New Zealand, Melanesia, Micronesia, and Polynesia?
9. How have historical migrations, trade routes, and colonial legacies shaped the cultural identities of the Caribbean islands and the countries of Central America?

UNIT- 7 AGRICULTURAL AND INDUSTRIAL REGIONS OF THE WORLD

7.1 OBJECTIVES

7.2 INTRODUCTION

7.3 CLASSIFICATION OF DR. HUNTINGTON

7.3.1 CLASSIFICATION OF JOHNSON

7.3.2 CLASSIFICATION OF WHITTLESEY

7.4 AGRICULTURAL REGIONS OF THE MAIN COUNTRIES

7.4.1 CHARACTERISTICS OF INDUSTRIAL REGIONS

7.4.2 INDUSTRIAL REGIONS OF THE WORLD

7.5 SUMMARY

7.6 GLOSSARY

7.7 ANSWER TO CHECK YOUR PROGRESS

7.8 REFERENCES

7.9 TERMINAL QUESTIONS

7.1 OBJECTIVES

After having the detailed study of this unit you will be able to:

- Understand the meaning of world's Agricultural system
- Learn about Whittlesey's classification on world agricultural system
- Gain knowledge about the world's Industrial Regions.

7.2 INTRODUCTION

Agricultural regions are vast regions with similar agricultural circumstances, particularly crop varieties and production processes, and a specific association in the use of agricultural land. This association is often obvious in the agricultural equipment used in a certain agricultural region, as well as the farmer's dwelling, lifestyle, and level of living. An agricultural region differs significantly from other agricultural regions in terms of similarity and relatedness.

An industrial region is one where industries are concentrated and other activities take precedence over others. A state cannot be considered an industrial state simply because of the concentration of industries in one location. This requires industry chain connectivity and interconnection. As a result, anytime an industrial landscape develops, the area becomes known as an industrial region. The majority of people in industrial regions work in manufacturing, with very few working in basic industries.

Many scholars have attempted to divide the world into multiple agricultural zones based on its natural environment. Climatic regions have been considered the primary basis for this categorization. Dr. Huntington and Johnson's classification is regarded important.

7.3 CLASSIFICATION OF DR. HUNTINGTON

Dr. Huntington has divided the world into the following four major agricultural regions:

- (i) Areas completely unsuitable for agriculture: This includes tundra and high snow-covered areas in Central Asia, Europe, North and South America, as well as waterless deserts.
- (ii) Areas suited for agriculture: These are areas where agricultural work is highly difficult due to the quantity of woods, such as the equatorial region and the chilly tropical taiga.
- (iii) Uncertain agricultural regions: Agriculture in these places is entirely dependent on rainfall, such as humid dry low latitude regions, northern China, monsoon regions, and temperate or dry regions.

(iv) Agriculture friendly regions: These include Western Europe, the Mediterranean, mid-latitude eastern coastal climate regions, humid-tropical, and tropical high plateau regions.

7.3.1 CLASSIFICATION OF JOHNSON

The famous geographer Johnson has also classified the world into three life areas based on natural surroundings, but he has added two more divisions. Their division is based on the link between different crops. The areas are as follows:

- (i) The tropical or equatorial agricultural region is separated into two transitional zones.
- (ii) Tropical and semi-tropical desert region: This region is also separated into two transitional areas.
- (iii) Semi-tropical or Mediterranean locations are known for their abundance of juicy fruits.
- (iv) Temperate living region: These regions produce little grain harvests.
- (v) Polar Dead Regions: These are areas where agricultural production is impossible due to a harsh climate.
- (vi) Monsoon or rice-producing regions.

The agricultural regions of Huntington and Johnson are largely natural landscapes, with crop production being the primary focus. The focus in these divisions has been solely on crop uniformity, although for agricultural regions, the strength derived from other different qualities such as production method, intensity of agriculture, specialization, and so on is more essential. These qualities are impacted not just by the natural environment, but also by numerous aspects of the human environment.

This clarifies the reason why agricultural qualities vary greatly even in regions with the same natural environment. agricultural in China and Japan, for example, differs significantly from agricultural in the eastern United States, although sharing a comparable natural environment and latitude. This disparity in agricultural qualities is not related to variations in rainfall, temperature, soil, or surface, but rather to disparities in Western and Eastern civilizations and agricultural systems.

7.3.2 CLASSIFICATION OF WHITTLESEY

In 1936, Dr. Whittlesey divided the world into specific agricultural regions. In his division, he made the following elements the basis of his classification:

- (1) Condition of agricultural produce and animals,
- (2) Types of agriculture,
- (3) Capital, labor and organization,

(4) Methods of consumption of agricultural produce,

(5) Use of scientific instruments.

(1) Agricultural produce and condition of animals: Whittlesey has considered crop production as well as the condition of animals under agriculture as the basis of his classification. According to his opinion, the interrelationship between the two is visible in agricultural areas. There is a close relationship between the two for agriculture. The production of animal husbandry and agriculture in a particular place depends on the surface, geological structure and climate of that area. For this reason, there are many areas in the world where crop production is important and in other places their place becomes secondary. But at some places animals have more importance and agricultural produce becomes secondary.

(2) Types of agriculture: Agriculture is done in different ways in different countries of the world. These types of agriculture can be dry, dry or irrigated. At some places this agriculture is done by ancient plows and at some places it is done by machines. Agriculture done for livelihood is mainly based on tradition. Animals are used in them.

(3) Capital, labor and organization: Due to disparities in availability of capital in different countries of the world, differences in classification are also noted. There is a difference in the organization, capital allocation and planning of agriculture between cooperative agriculture in Russia and capitalist economy in western countries. On this basis also, differences are found in agricultural areas.

(4) Methods of consumption of agricultural produce: Variation is seen in agricultural areas on the basis of consumption of agricultural produce. At some places, agricultural produce or food grains are produced only for self-reliant use, while at others it is produced for commercial use. On this basis also, variation is found in agricultural areas.

(5) Use of scientific equipment: Scientific equipment and scientific level of farmers create differences in agriculture. Agricultural yield can be increased by the use of chemical fertilizers. The yield can also be increased through mechanical actions. The crop can be freed from damage by the use of pesticides.

By including all the above mentioned basic elements, Whittlesey has divided the agricultural regions of the world as follows:

The classification is presented:

1. Nomadic Herding Regions
2. Commercial Livestock Regions
3. Shifting Cultivation Regions

4. Rudimental Sedentary Agricultural Regions
5. Intensive Subsistence Rice Producing Regions
6. Intensive Subsistence Non-Rice Producing Regions
7. Commercial Plantation Agricultural Regions
8. Mediterranean Agricultural Regions
9. Commercial Grain Framings
10. Commercial Stock Raising and Crop Farming Regions
11. Subsistence Crop and Stock Raising Regions
12. Commercial Dairy Farming Regions
13. Specialized Horticulture or Plantation Regions

1. Nomadic Herding Regions

Nomadic pastoralism is considered a very ancient economy. In these regions, animals are taken from one place to another and grazed. Generally this practice is more prevalent in those regions where there is very less rainfall, the climate is found to be harsh and the entire economic life depends on animals. Due to harsh climate and less rainfall, grass grows less in such areas and even if it grows, it gets destroyed soon due to less moisture. Therefore, the shepherds of these regions keep traveling from one place to another in search of fodder for their animals.

The main areas of this type of agriculture are dry regions of Africa and Asia, grassy southern or marginal tundra regions. In these regions, humans keep traveling with their animals; hence this type of agriculture is also called 'shifting agriculture'. This transfer is of two types – (i) Local migration, and (ii) Seasonal migration.

1. Local Migration: These types of transfers are limited and temporary. The Baddu people who keep camels and horses go to long distances with their animals, whereas the Baddu people who keep sheep and goats go only to the border of the desert in Arabia and return to their villages after the end of the grass. Reindeer herders from the tundra migrate to western Sweden and northern Norway during the short dry season, and return to forest areas in the winter.

(i) Seasonal Migration: A special type of pastoralism is found in the Mediterranean regions and Central Asia. These cattle herders shift to higher slopes during the summer season and to the lower valleys during the winter season.

Areas of Nomadic Herding

This type of pastoral area includes the Lapps and Samoyeds of Central Asia (Mongolia, Tibet, steppes of Russian Turkestan and Siberia), the Lapps and Samoyeds of the tundra region and the Baddu people of the Sahara.

2. Commercial Livestock Regions

Animal husbandry on a commercial scale is done by civilized people in modern times in temperate grasslands and tropical savannah regions. Roughly, a little more than 1 percent of the entire world's population is engaged in this enterprise. The specialty of this type of pastoralism is that here the cattle herders generally stay at one place and the pastures are spread over large areas.

Characteristics of Commercial Livestock

1. In arid and semi-arid areas, more attention is given to animal husbandry than to the cultivation of grains because agriculture is not possible in these parts due to irregularity and insufficiency of rainfall, but many types of grasses grow which animals can eat. But animals can be grazed.
2. Variation is found in many areas under animal husbandry. Generally, cows, sheep and goats are reared everywhere, but due to nature given and human reasons, differences are found in the animals in a particular area. In the regions of North and South America, cows, bulls and sheep are reared more, whereas in South Africa, Australia and goats are reared more in New Zealand.

Whittlesey's classification of agricultural regions

1. Nomadic pastoral regions 2. Commercial livestock farming regions 3. Shifting agricultural regions 4. Early permanent agricultural regions 5. Rice-dominated deep subsistence agricultural regions 6. Rice-free deep subsistence agricultural regions 7. Commercial plantation agricultural regions 8. Mediterranean agricultural regions Commercial Grain Producers Agriculture Region 10. Commercial Crops and Livestock Agriculture Region 11. Subsistence Produce and Livestock Agriculture Region 12. Commercial Dairy and Livestock Agriculture Region 13. Horticulture Agriculture Region.

(3) The main objective of commercial animal husbandry is to obtain wool, meat, leather, hide, hair; hooves etc. from animals and export them. In these areas, animals are usually brought from nearby areas, fed with maize, grass, and elephant grass to keep them healthy and then sent to nearby industrial cities to supply meat.

(4) Animals are grazed on vast pastures. These pastures are spread over thousands of acres of area. In the United States these pastures cover up to 1,000 acres and in Russia up to 10,000 acres. Grasslands are spread over 13,000 square kilometers in Australia. These animals are also well taken care of.

(5) All facilities like shepherds' houses, fodder storage areas, cold storage system etc. are available on the pastures or near them.

Areas of Commercial Livestock

From the point of view of study, commercial animal husbandry areas can be divided into the following two parts:

1. Animal husbandry in temperate grasslands,
2. Animal husbandry in tropical grasslands.

1. Animal husbandry in temperate grasslands: Animal husbandry on a commercial scale is generally done in arid and semi-arid areas where European people have settled. This occupation has developed in those parts where an unprecedented mix of people associated with Western civilization and arid and semi-arid areas is found. This work is especially done in Western North America, Patagonia in South America, the Brazilian Plateau, the plateau parts of South-Eastern Africa and Australia, New Zealand, the western region of Russia and North-Eastern Europe.

(i) Western-North America: Most of the quadrupeds are reared in the plains and plateau parts of Western-North America-United States, Canada and Prairie region and Northern Mexico. In the western United States and Canada, cattle grazing are done in 3/4 of the total land. In these areas, cattle (for meat and milk), sheep (for wool and meat), Angora goats (for hair) are reared. Here animals are reared on alfalfa, mama grass, hay grass and elephant grass.

(ii) South America: The second important animal husbandry area in the world is the grasslands of South America. Cattle are raised in this region in Brazil, Argentina and Uruguay. Cattle are raised in the dry plains and mountainous regions of western Argentina, in southern Patagonia and Paradal Fuego. This region is world famous for its meat animals. Cattle, sheep and horses are reared in this area.

(iii) Australia-New Zealand: The third main area of animal husbandry is found in Australia and New Zealand. Sheep are mainly reared in Australia. This region is located in the south-eastern and western parts. Due to the humid climate in these parts, meat sheep are better reared.

In New Zealand, cattle are reared for milk and meat and sheep for wool and meat. Nutritious grass is grown in 1/3 of New Zealand. Due to good climate, animals graze in open pastures throughout the year.

(iv) Other areas: Moorland in Britain, Netherlands and Denmark are also famous for animal husbandry and sheep rearing. Cattle, Angora goats and sheep are raised in the veld grasslands of South Africa.

(2) Animal husbandry in tropical grasslands: These areas include the Compass and Lanos (South America), the Down lands in Queensland of Australia and the Savannah areas of Africa. 50 to 100 cms in all these areas. It rains, but due to the hot climate the rain water dries up soon. Sheep, pigs, chickens and cattle are reared in these plains.

Features of commercial animal husbandry

(1) Animal husbandry is an important business in all these areas. Food production is very important for these cattle farmers has less importance.

(2) Animals also influence the culture here. There is more regional specificity in animal husbandry. She goes.

(3) The export items contain more animal products.

(4) Animal husbandry is done through scientific methods.

(5) The entire economy of these regions depends on animals.

3. Shifting Cultivation Regions

Even today, the form of agriculture is very ancient in the lowland and mountainous areas of hot-humid tropical agricultural regions. Due to high temperature and heavy rainfall, dense forest areas are found in these regions. Even after cutting them, weeds grow very fast in the areas. Due to excess rainfall, the nutrients of the soil flow away to the lower layers and the land becomes infertile. In these areas, the first crop is obtained well, but after two-three years the fertility of the land decreases and the agricultural yield continuously decreases. As a result, the residents here keep shifting their agriculture from one place to another. This type of agriculture is called 'shifting agriculture'.

This type of agriculture is done in the Amazon Valley of South America and Central America. In Asia, similar agriculture is also done in parts of India, Thailand and Cambodia. This type of agriculture is called by different local names. Jhum, Airaka, Panda, Jara etc. in India, Chena in Sri Lanka, Tugya in Myanmar (Burma), Ladang in Java and Malaysia, Fang in Congo-Africa and Milpa in America.

Methods of farming: The elders and experienced people of the tribe decide in which areas this type of farming should be started. First, a certain area is selected in the forest whose trees can be easily cut. The land where trees grow taller is generally more fertile than other areas. After the land is selected, the trees in that area are burnt due to which the soil gets adequate amount of potash through the ashes. These types of areas generally range from 1 to 5 acres. Crops like taro, yam, sorghum, millet, banana, palm, cocoa etc. are grown in these parts. When the fertility of that land is destroyed, then other land is searched for and the land is prepared for agriculture by burning trees in the same way. In this way agriculture keeps shifting from one place to another.

Features of shifting agriculture

Shifting agriculture has the following characteristics:

- (1) In this type of agriculture, more importance is given to the production of fruits. Although maize is among the crops Jowar, millet and paddy are also cultivated prominently.
- (2) This agriculture is not done by mechanical means but with the help of spades.
- (3) The standard of living of farmers in such agricultural areas is very low.
- (4) Due to high rainfall and temperature throughout the year in such agricultural areas, natural vegetation grows very fast. This process of nature always continues. This type of agriculture mostly occurs in tribal areas is found in.

4. Rudimental Sedentary Agricultural Regions

This type of agriculture is mainly done in hot, humid low areas, in lowland areas, on semi-hot and temperate plateaus and in tropical hilly areas. The characteristics of this type of agriculture are similar to shifting agriculture, but the only difference is that there is no change of place in agriculture. It is based on agriculture, but has developed since ancient times. Where natural conditions appear favorable for agriculture, shifting agriculture is transformed into permanent agriculture.

Due to excess population in tropical regions, the element of stability in agriculture gets lost. This type of agriculture is suitable for intensive farming.

5. Intensive Subsistence Rice Producing Regions

In this type of agricultural regions, rice is cultivated mainly for local consumption. The slave-dominated intensive agricultural regions are located in those hot humid regions of the ancient world where about 1/3 of the world's population resides. Natural conditions are also suitable for this agriculture in these areas. To provide food to the large population, intensive agriculture is done on the land. Two or three crops are obtained in the same agricultural area in a year. The land of this area is divided into small pieces due to it being under agriculture since ancient times. Usually the farms are small and agriculture is done according to ancient traditions.

This type of agriculture has the following characteristics:

- (1) Due to agriculture being done in heavily populated areas, under this type of agriculture, such crops are produced in which maximum labor can be used and maximum food grains can be produced, which can solve the food problem. Apart from rice, crops like wheat, sugarcane, jute etc. are grown in these regions.
- (2) In these agricultural regions, agriculture is mainly done with the help of animals.

(3) Machines are used very little in these regions. Agriculture is done using orthodox methods which have been prevalent since ancient times.

(4) The fields are very small and scattered, a large part of the land is wasted in making ridges and fences, due to which labor is wasted and money is also wasted.

(5) Only those crops are obtained from these regions which are for personal use. Due to small farms and conservative farming methods, not much is produced so that it can be exported. The main produce of these regions is rice. Up to three crops of rice are sown in these areas.

6. Intensive Subsistence Non-Rice Producing Regions

Although the natural environment in this type of agricultural regions remains almost similar to the earlier agricultural regions, rice is not an important agricultural product in this region. This type of agriculture is called dry farming. In this type of agriculture, different types of crops are grown and the yield depends on rainfall. There is no importance of any one crop in this.

7. Commercial Plantation Agricultural Region

In different parts of the world, crops are grown commercially, such as banana, sugarcane, tea, coffee, rubber etc. in the tropical regions. Commercial plantation agriculture is generally done in those areas where the temperature is 17-7°C throughout the year. Temperatures remain higher than. Tropical plantation agriculture is done in the following three main regions:

1. In the countries of Latin America,
2. In the countries of the west coast of Africa, and
3. In the bays of South-East Asia.

(1) Latin American countries: Latin American countries include Brazil, Cuba, Mexico, Guyana etc. Various types of produce like banana, coffee, sugarcane etc. are produced in these countries.

(2) Countries on the western coast of Africa: Coconut, cocoa, banana, pineapple etc. are produced in the western coast of Africa and the regions of Malagasy.

(3) Countries of South-East Asia: India, Malaysia, Sri Lanka, Indonesia etc. come under South-East Asia. Rubber, tea, sugarcane etc. are produced in these countries.

Features of commercial plantation agriculture

Commercial plantation agriculture has the following characteristics:

- (1) It is a part of large-scale agriculture. Only one commercial crop is grown at one place for sale.

This specialization of agriculture is only for tropical products for which high temperatures and more rainfall occur in these regions. There is a close relationship between the natural environment and this type of agriculture because the crops which require cool climate throughout the year are grown on high slopes only.

(2) The form of plantation agriculture is quite systematic and scientific. Therefore, for agricultural work, adequate amount of capital is required for machines, equipment and fertilizers etc. This capital is received from developed countries of Europe and America. Apart from this, administrative and technical knowledge, chemical fertilizers, railway system, disease preventive medicines for workers, clothes etc. all come from these countries. Therefore, plantation agriculture has been expanded in most of the areas by European or American capitalists.

(3) Plantation agriculture is done only in those scattered parts of the world around which other livelihood enterprises are located. As a result, food grains cannot be obtained completely from this agriculture; hence one has to depend on other countries for food grains.

(4) Under this type of agriculture, special items are produced for temperate countries. Under this, the most profitable crops are sugarcane, coffee, tea and rubber but other crops are also in demand; like banana, coconut, cocoa, palm, cinchona, etc.

Typical areas of plantation agriculture in the world include rubber plantations of Malaysia, rubber and sugarcane plantations of Indonesia, tea plantations of Sri Lanka and India, tea, coffee and sugarcane plantations of Malagasy, banana plantations of Latin America and sugarcane fields of Cuba. Examples of plantation agriculture are

8. Mediterranean Agriculture Region

Mediterranean climates are a special type of climate in which winter is rainy and summer is dry. This climate also has its special impact on agricultural production. Both subsistence and commercial farming systems have been developed in the Mediterranean regions.

Characteristics of Mediterranean agricultural production

Mediterranean agriculture has the following characteristics:

(1) According to the methods of agriculture, proximity to cities, amount of rainfall, technical knowledge of farmers, government protection, the methods and production of agriculture vary in different areas. For example, in Morocco, Algeria and Tunisia in North Africa, barley, grapes and olives are cultivated due to lack of rainfall. Various types of crops are grown - grapes in Greece, grapes and oranges in Spain, oranges in California, vegetables, wheat in Italy, fruits in central Chile etc.

(2) The following forms of agriculture are found in the Mediterranean agricultural regions:

- (i) Subsistence type of agriculture, and
- (ii) Commercial agriculture.

Subsistence type agriculture: Subsistence type agriculture is practiced more in central Spain, southern Italy, Egypt and Turkey. Under this type of agriculture, crops like wheat, fig, olive, barley etc. are grown.

(ii) Commercial agriculture: Geographical agriculture is done in areas like Northern Italy, Southern France, coastal part of Spain, California etc. Under this agriculture, juicy fruits, grapes, apples, vegetables etc. are especially produced. Agriculture in these regions is done by machines. Here fruits etc. are produced for export. Mainly the following three types of crops are grown in the Mediterranean regions.

(1) Winter agricultural produce: This is the rainy season in the Mediterranean agricultural regions. As soon as autumn begins, food grains (wheat and barley), vegetables etc. are sown which become ripe and ready by spring. These crops grow quickly in humid and moist climate during winter season. Potato, tomato, beans, carrot, radish, beetroot, cabbage etc. are the main winter produce vegetables. The commercial importance of these vegetables is very high.

(2) Summer agricultural produce: Spring season is dry in the Mediterranean regions, but in areas where irrigation facilities are available, commercial agricultural crops are sown, in which fruits, vegetables, fodder crops, grapes are cultivated extensively. Yes, juicy fruits (oranges), apples, pears etc. are also produced. Cotton is also produced under spring agriculture.

(3) Agricultural crops without irrigation: Olives and figs are agricultural crops without irrigation. It is considered a tree product in the Mediterranean regions. These crops are grown without irrigation. 90 percent of the world's total olive production is produced in the Mediterranean regions only. Similarly, the fig tree bears fruits twice a year without irrigation.

In the agricultural regions of the Mediterranean, the importance of animals also varies from one region to another. In some parts the number of animals is very high and in some parts it is very less. In areas where grass grows due to excess rainfall and low temperature, milch animals are reared, but where grass grows less, sheep and goats are reared.

Like the physical environment, human activities also affect this agriculture. Variation is found in crops and animals due to human activities. Whether agriculture is commercial or subsistence farming varies in different areas due to human influence. Fruit production in California has developed more due to its commercial importance, whereas in European countries, fruit production is still being done using old methods.

9. Commercial Grain farming Agriculture Region:

Commercial grain production is done in intermediate latitudes between 30° to 55° North and South. The major commercial grain producing regions of the world are as follows:

- (1) The largest of these producing areas is the 3,200 km long area of Eurasia in southern Russia, from the city of Kiev to Omsk in Siberia, and the 1,120 km wide area between the Caucasus and the Volga River.
- (2) In North America, its expansion is seen in Canada and the United States. The provinces of Alberta, Manitoba and Saskatchewan in Canada and North and South Dakota, Columbia Basin, winter wheat belt, winter soft wheat and Corn Belt in the United States are the main commercial grain producing regions.
- (3) In South America, huge areas of this type of agriculture are also found in Argentina and Australia.

In other words, commercial grain production is mainly done in mid-latitude grasslands. Areas of this type are found in Prairies in America, Steppe regions of Russia, Pampas in Argentina and Downs in Australia.

Features of commercial grain producing agriculture

Commercial grain producing agriculture has the following characteristics.

- (1) Under this, only one agricultural produce (food grain) is produced, of which wheat and maize are the main ones.
- (2) The entire agricultural work is done by machines.
- (3) Agriculture is carried out only with the help of local labor.
- (4) In commercial grain producing agriculture, the size of the fields is very large; hence machines can be used very easily.
- (5) In this type of agriculture the importance of animals is very less.
- (6) The weight of population in these agricultural regions is very less; hence sufficient food grains are left for export.

This type of agriculture is the gift of the industrial age. These types of agricultural areas are generally found in semi-arid areas. They are found where till some time ago tribal or nomadic shepherds used to graze animals. These areas are humid and are located in the middle of the dry climate and far away from the maritime parts.

Wheat is the main produce of these areas. Spring wheat is grown in Canada, the northern United States, and Siberia, while winter wheat is grown in Australia, Argentina, the Central United States, and the Republic of Ukraine.

10. Commercial Livestock and Crop Farming Regions

This type of farming is also called mixed farming. The business objective of farmers lies in the production of crops and rearing of animals. Europe and the United States are the main areas of this type of agriculture. This type of farming is done in the central United States; states of Ohio, Indiana, Illinois, Iowa, Nebraska, Virginia and in the southern states of Georgia, Oklahoma and Texas. In this type of agriculture, crops are given as much importance as animal husbandry.

Features of Commercial Crop and Animal Husbandry Agriculture Region

Commercial crop and animal husbandry agriculture has the following characteristics of the region:

- (1) Under this agricultural sector, both crop production and animal husbandry are done simultaneously. Here agriculture is mainly done for food grains, fodder and grain trade. Of corn in the United States Crops are grown to feed animals.
- (2) Animal husbandry is the main source of income for the farmers of this area. Animals include pigs, cattle, and chickens etc. are the main ones.
- (3) This type of agriculture requires more labor and capital.
- (4) Maximum use of machines is done in agriculture and animal husbandry.

11. Subsistence Crop and Stock Farming Regions:

This type of farming areas are found in Russia and underdeveloped countries. The plateaus of Mexico and Anatolia are the main examples of this type of agriculture. In this type of agriculture, along with animal husbandry, coarse grains (sorghum-millet) are cultivated in the countries of the ancient world and maize is cultivated in the countries of the New World.

12. Commercial Dairy Farming Regions

The main objective of this type of agricultural areas is farming for milk and dairy animals. There are three main areas of this type of agriculture:

- (1) Western European countries Denmark, France, Germany and Britain etc.
- (2) North-eastern part of the United States and Canada.

(3) Australia and New Zealand.

(1) Countries of Western Europe: Industrial development has taken place in many countries of Western Europe, there is a lot of shortage of cultivable land, and hence these countries have developed the dairy business. In these countries, the number of dairy animals per square kilometer is higher as compared to other countries. Denmark is the largest exporter of milk and milk products.

(2) United States of America (i.) The agricultural belt from New York to the state of Wisconsin is the center of the dairy industry. The climate here is favorable for animal husbandry, so fodder is easily available.

The farmers here cultivate fruits, vegetables and sugar beet. Animal husbandry is also the main occupation in the valleys of rivers like Puget Sound, Snake etc. in the states of Washington and Oregon in the North-West United States.

(ii) Canada: In the eastern provinces of Canada, animals are reared for milk. The climate of this region is maritime. Due to this, favorable conditions are found for grass due to humidity; hence dairy industry is flourishing in this area has also developed.

(3) Southern Hemisphere (i) Animal husbandry is an important business in Australia. Rainfall in Australia is uncertain, hence the number of animals is found in large numbers only in the south-eastern and north-eastern parts.

(ii) This type of agriculture is very important in New Zealand. The climate of this country is found to be more suitable for this type of agriculture. In New Zealand, animals are grazed on pastures throughout the year. Tararua, Auckland in the North Island and Canterbury Plains in the South Island are the major dairy industry areas. Dairy products account for 30 percent of New Zealand's total exports.

13. Specialized Horticulture or Plantation Region

This type of agriculture has generally developed near big cities. In this type of agriculture, there is variation in crop and land use. It is especially developed in the countries of Europe, Mediterranean regions and North America. In this type of agriculture, vegetables and flowers etc. are cultivated which have high local demand. There is a change in the yield in this agriculture only on the basis of local demand.

7.3.4 AGRICULTURAL REGIONS OF THE MAIN COUNTRIES

1. Agricultural regions of the United States

The United States is the largest producer of agricultural crops in the world. Here, 13 percent of the world's total production of wheat, 31 percent of corn, 16 percent of cotton and

other agricultural crops is produced is also an important place. Following are the main reasons for progress in the field of agriculture:

1. Nature has provided excellent climate and fertile land for agriculture in the country. ,
2. Man has developed commercial agriculture by making scientific inventions for the development of agriculture.
3. Due to low population, the United States is able to export agricultural produce to other countries also.
4. Here agriculture is generally done on big farms due to which production is high and machines are used in agricultural production.

The United States can be divided into the following agricultural regions:

1. Subtropical climate agricultural region,
2. Cotton growing region,
3. Wheat and maize growing regions,
4. Winter hard wheat growing area,
5. Maize growing area,
6. Spring wheat region,
7. Milk and grass areas,
8. African coastal fruit and mixed farming areas,
9. Pasture and irrigated agricultural areas,
10. Pacific coastal agricultural region.

1. Subtropical climate agricultural region

Subtropical belt extends from the coastal part of the Gulf of Mexico to the state of Florida. Due to the hot climate and marshy land, some parts of this belt have a special importance from the point of view of agricultural crops. Here in winter it is 9°C. to 15°C. The temperature remains here and rainfall occurs throughout the year due to cyclones coming from tropical regions. Due to high temperatures and adequate rainfall, subtropical climate crops like rice, sugarcane and cotton are grown here, but the first two crops are more important because these crops are not grown in other areas in the mainland of the United States. Cotton is mainly produced in the western region. Although excess rainfall is harmful for cotton, cotton grows in the coastal parts of the state of Texas due to fertile soil is produced.

(i) **Rice cultivation:** Rice cultivation requires flat fertile land and more rainfall. Generally the temperature in this part is 15°C in winter season but in the summer season the temperature remains between 23°C to 25°C which is very favorable for the production of rice. Good soil and 100 cm in the Mississippi River Delta. Rainfall of about 1.5% is very helpful for the production of rice. Rice is also produced by irrigation with the water of Mississippi River. Rice cultivation is done with machines. For this reason the production per hectare is highest here.

(ii) **Sugarcane:** Sugarcane is the second main agricultural crop of this agricultural region. The only sugarcane growing region on the mainland of the United States is located in the Gulf Coast region where the temperature is 25°C. From 30°C., Is found till. Frost is harmful for this produce. For this reason, early maturing variety of sugarcane is produced in the state of Louisiana. For its crop about 150 cm. Rainfall is required but in the areas with less rainfall in this agricultural area, sugarcane is grown through irrigation. Favorable conditions for sugarcane crop are found everywhere in the Gulf Coast region of the United States, due to which more sugarcane is produced in this agricultural region. Sea winds which are beneficial for sugarcane cultivation often blow here.

Sugarcane Production in the United States: The main sugarcane producing areas in this agricultural region are as follows:

- (i) The lower valley of the Mississippi River and the coastal area up to the state of Georgia, and
- (ii) Florida

Florida State: In this state, sugarcane is grown near the Everglades and the sugar factories are in the Everglades state.

2. Cotton growing region

The United States has an important place among the cotton producing countries. The northern limit of cotton production in this country is determined by the 26° north latitude line and 100° west longitude line. The temperature in the northern part here is 26°C, and in the southern part the temperature is 28°C. to 30 C. Therefore, cotton cultivation is reduced in this part. There are not 200 frost-free days in this area. In the southern part, such favorable conditions continue for 360 days. Rainfall in the entire cotton production area is 60 to 150 cm. In which there is more rainfall in the west and less rainfall in the remaining parts of the year. Mainly all major areas receive 50 cm rainfall in autumn. There are areas with less rainfall.

Cotton production area in the United States is mainly limited to the southern states because the climate in these parts is ideal for cotton. The main cotton producing areas here are as follows:

1. Black Momia soil is the cotton producing area of the region in the states of Texas, Oklahoma and Arkansas The region is located in the valley of the Arkansas and Rand Rivers and is an area

of cotton farming with the assistance of irrigation. This region is the largest cotton producing region in the world.

(2) The area with soil formed by the floods of the Mississippi and its eastern tributary Yazoo is the highest cotton producing area. This area extends from near Vicksburg, 320 kilometers south of Memphis, on both sides of the Mississippi River. The clayey, alluvial soil brought by the rivers is highly productive. For this reason, per acre yield of cotton in this region is the highest in the world. Cotton has been cultivated in this area for years without any fertilizer. Long fiber cotton is produced here.

(3) Two large cotton fields are located between the Mississippi River and the Atlantic coast, one of which is Blue ridge near the mountainous plateau and some parts in the south-eastern part are located between the Black Warrior River and Tennessee rivers. In the north, the boundary of this region extends up to the Blue Ridge and at some places up to the place where there is no frost for 200 days.

Other areas: in the central part of the states of Carolina, Georgia and Alabama and the north-eastern part of Mississippi. The black soil region is located in the central and southern part of the state of Alabama. Lime in the soil of this area is found. The cotton here is of short fiber.

Long staple cotton is grown in the coastal islands and coastal areas of Georgia and Carolina. The length of cotton fiber produced here ranges from 3 to 5 cms. Since its fibers are very soft and shiny, its demand is high and good clothes are made from it. This cotton requires more moisture and requires more effort to gather it.

The major cotton producing states and their yields are as follows: In 2000, 2,80,000 acres of native cotton were planted in Arizona, yielding 7,91,000 acres of cotton. 5,000 acres of American Pima cotton were grown, producing 7,200 bales of cotton.

3. Wheat and corn production area

According to Baker, this region extends from the Finn hills in the west to the Appalachians in the east, after which this region expands towards the north-east where it meets the dairy and grass farming region in the north.

Although the area of this area is 1 percent more than the maize farming area in the north, but in terms of value, the producer of this area is half the value. The two main reasons for this are as follows:

(1) Due to the land not being suitable in most of the areas, there is a reduction in the total sowing area. Many areas throughout the West are not suitable for growing corn or wheat.

(2) Many types of soils are found in this area due to which the yield per acre is less.

The eastern part of this agricultural region is more fertile because it is the coastal part of Maryland and Virginia. To the west of this region lies the mountainous and plateau region which is part of the Appalachians. The main crops here are maize, wheat and grass. To the west of the mountainous region, the land is not fertile but hilly because due to the arrival of the Appalachian Mountains there is a lack of fertile soil and most of the area is covered with forests. The soils in the south-west of this region are fertile. Lexington and Nashville have pastureland on soils made up of lime and phosphorus-rich rocks. Rainfall in the entire agricultural area was 75 cm. It is around 25°C and the temperature in spring season is 25°C. To 28° C. lives. The growing season in this region lasts for 180 to 200 days.

In the eastern part of this belt, winter wheat is also cultivated along with maize. The main states for wheat cultivation are Ohio, Illinois, Indiana, Virginia, New York and Maryland.

4. Winter hard wheat growing area

The winter hard wheat growing region lies west of the central wheat and corn growing region of the United States. This agriculture includes parts of the states of Kansas, Nebraska, Oklahoma and Colorado. The rainfall in this part is approximately 508 mm. to 762 mm. Happens till then. The soil of this area is more fertile. 3/4th of this area comes under wheat production.

5. Maize growing area

Maize crops cover a large area in the United States. The maize area extends from the Gulf Coast region in the south to the Lake District and from the state of Kansas in the west to the western plateaus of the Appalachian Mountains, but even in this region there is an area which is called the maize belt. 30 percent of the world's total maize production is produced in this maize belt only. The region extends from Ohio in the east to Kansas in the west and from Wisconsin to Kentucky in the south. To determine the boundaries of this agricultural area, Baker included only those areas in which the production of corn per square kilometer was 1,200 bushels. Thus, in these conditions, the natural conditions determine the environment of this area. In the east its range extends to the western Appalachians because this land is not suitable for cotton. Central United States The western boundary of this region is determined in the south by the Mississippi and in the east the boundary is determined by the glacier-affected area. In the west its limit is 20 cm in spring, which is determined in even years; 25° C. Maize production is difficult north of the seasonal isotherm. Therefore, the summer isotherm of 25°C forms the northern boundary.

In the maize growing area, more fertile land and more machines are used. The yield per acre of corn is 68 bushels in Illinois, 50 bushels in Indiana. In many areas maize is sown in crop rotation. 40 percent of the entire area comes under maize production. The corn growing states of Iowa, Indiana and Illinois account for 40 percent of corn growing areas. Corn is cultivated in 30 percent of the area in the states of Ohio and Missouri.

Use of maize: The use of maize is increasing. Therefore, due to increasing demand, maize cultivation is also being expanded in this area. In the United States, maize was cultivated only in 2 crore 50 lakh hectares in 1973, but in the year 2003 this area has increased to 12 crore 25 lakh hectares. Maize is mostly used for feeding animals. 40 percent of the maize is used to feed pigs, 20 percent to feed meat animals, 14 percent to feed chickens and the rest for other consumption. Maize is most commonly consumed for raising cattle and fattening pigs. This agricultural region produces 35 percent of the United States' hogs and 50 percent of its beef cattle. The meat of these animals is prepared in the city of Chicago, packed in boxes and sent to different parts of the United States goes.

6. Spring wheat belt

This agricultural region extends to North and South Dakota and North-Western Nebraska of the United States. This region extends to the states of Minnesota and Montana. This spring wheat field is spread over an area of about 160 kilometers long and about 320 to 800 kilometers wide. The northern boundary of this region is determined by the international boundary line of 98° longitude in the east, the Rocky Mountain region in the west and the hard winter wheat region in the south.

In winter season, it is not possible to cultivate wheat due to the temperature reaching below the freezing point. Therefore, wheat crop is sown in spring after the snow melts. , For wheat production, 17° to 21°C. Temperature is required. For this reason winter wheat cannot be produced. This happens. The wheat of the field is red and hard .

7. Dairy and grass production areas

The northern boundary of this region is determined by parts of the Laurentian Shield and the eastern boundary is determined by the Adrenodoc and New England mountains. The region reaches from the Lake District in the south to the Dakotas in the east, to parts of the Appalachian Mountains in the east of New York State. To its south is the maize belt which joins the maize and winter wheat belt in the south-east. In the southern part of this region, maize is the main crop which is used as green fodder for animals. Winter wheat is also grown near the southern border, primarily in the states of Wisconsin and Michigan, but only as part of a crop rotation. The climate of this region is more suitable for grass. Constant light rainfall and low evaporation are conditions that favor the growth of grasses, resulting in natural and cultivated pastures. The land is very sandy and even marshy at some places, the soil is uneven, and hence there are no possibilities for agriculture. For this reason dairy business has been developed here. Apart from the unsuitability of land and climate, there is another important reason which has encouraged dairy business in this region. This area is an important industrial area of the country and there are many industrial cities near it where there is high demand for dairy products.

In this area, work is also done to improve the breed of animals so those good breeds of cows are prepared. High quality cattle imported from Europe are raised in this area, including Holstein and Durham is the main.

Favorable climate, good quality grass and rearing of advanced animals led to the rise of business in this area. Big cities that use milk are located nearby where the demand for these commodities is high. Thus, in this region, cattle are raised and dairy farming has developed in the states of Southern Wisconsin, New York, Michigan, Indiana, Illinois, Ohio. United States in the production of milk and milk products (milk, cheese, butter, milk powder) it is an important place. This business has developed more in the states of Wisconsin, Ohio, Michigan, and Pennsylvania. The state of Wisconsin is the nation's leader in dairy farming. Maximum cheese of the country is prepared in this state. The reasons for this are as follows:

1. There is continuous rainfall in the spring season in the state of Wisconsin. Due to this reason the grass continues to grow fodder is continuously available.
- (2) The surface of this state is uneven and farming is difficult. For this reason proper use of land Animal husbandry is done according to the climate.
- (3) Due to the proximity of industrial areas in this area, the demand for milk products is high, hence this industry got encouragement.
- (4) Cows of good breed are being reared in this area since the beginning.

8. African coastal fruit and mixed farming area

Fruit and vegetable farming has developed very rapidly in the United States. Fruits and vegetables are produced in different parts of the country. Due to the development of roads, farmers started getting the facility to send fruits to distant fruit markets as quickly as possible; all this became possible with the help of trucks. For this reason this type of agriculture is also called 'Truck Farming'.

There are three major areas of fruit vegetable farming on the East Coast of the United States:

1. New England State: Due to the unevenness of the surface and infertile soil, it is not possible to sow agricultural produce in a wide area, the period for growing crops is only 90 days, hence here fruits, vegetables etc. are grown in small fertile areas; are done. Terraced fields are used to grow vegetables in the Connecticut Valley. Potatoes are grown extensively in the Aroostook Valley of the state of Maine. This state is the third largest potato producing state in the country. Potatoes and apples are cultivated in Massachusetts.
2. Central Ocean coastal regions: Vegetables and fruits are grown in the marshy lands in the coastal areas of the New York, Maryland, New Jersey, Delaware and Virginia. Fruits like tobacco, grapes, apple, pear, plum etc. and vegetables like pea, cabbage, beetroot etc. are the

main parts of agriculture of this region. New York is the second state in the country in apple production. Grapes, potatoes and vegetables are also produced here. Tomato is produced mostly in New Jersey.

3. South Eastern Florida: Florida is an important state in terms of producing vegetables. 25% of the vegetables of the entire country are produced in this state. Here grapes, cabbage, beetroot, carrot, tomato etc. are cultivated in sufficient quantity.

9. Grassland and irrigated agricultural areas

In the large plains of the central plains of the United States, animal husbandry, especially sheep and horse breeding, is practiced. In dry areas, pastures are prepared with the help of irrigation. Such areas are found on the slopes of the Rocky Mountains and in the state of Wyoming.

10. Pacific Coast Agricultural Region

The following two important agricultural regions are on the West Coast of the United States:

- (1) North Pacific agricultural region,
- (2) Valley of California.

2. Agricultural regions of China

Pro. J. I. Buck did a detailed study of 168 areas and 16,786 farms in China in 1929 and 1933 and divided the entire agricultural region into two major agricultural regions, wheat and rice regions. In determining the size of these regions, due importance has been given to the agricultural methods, surface, climate, soils, natural vegetation, technology, labour, crops, irrigation and fertilizers etc. of each region.

According to Buck, China's agricultural sector can be divided into the following 8 agricultural sectors:

1. Spring wheat field,
2. Winter wheat and cowling areas,
3. Winter wheat and millets area,
4. Yangtze rice-wheat region,
5. Jechawan Rice Field,
6. Rice-tea area,

7. Double yielding area of rice,

8. South West Rice Region.

1. Spring Wheat Region: The surface of this northern region is hilly, which is 750 meters to 900 meters above the normal surface of China, but in many parts this height has reached 1,500 meters. Most of this height is located in Kansu province. There is no flat land anywhere in this area except the coastal parts of the Hongho River. Although the northern part of Loess comes under this region, it is also not suitable for agriculture. In this area of uncertain rainfall; Only 35 cms. It just rains. Half of this rainfall occurs in the form of heavy rainfall only in June and August. The growth period of this sector is very short i.e. only four months. Winter is harsher in this region. The main crop of this entire region is wheat in spring season. Due to melting of snow in spring, the land of this area become moist due to which plow can run easily in it and hence wheat crop is grown.

Apart from spring wheat, potatoes, barley, sorghum, millet and oats are the main crops of this region.

2. Winter wheat and cowling area: This agricultural area is spread in the northern plain of China. From here the main crops are winter wheat, cotton, cotton, sorghum, millet, barley, corn and soybean. Wheat crop is sown in autumn which gets ready in winter and becomes ripe in the beginning of the year, after that soybean, corn and peanuts are produced in the same fields before autumn. Share of total agricultural area this is a similar type of double crop field. 2/3 of all China's cotton production is produced in this region. Rainfall is less in this entire area, 88 cm in the southern part. And towards the north it is less than 43 cm. it occurs. Rice is also cultivated in some places in the south.

At the time of Back's study, only 10 percent of the agricultural area in this entire region was irrigated, this irrigation was mainly done from wells in the dry northern part. Presently the irrigated area is more in this area. The region receives irrigation from the Quanting Reservoir, north of Beijing. Maize, oilseeds, kaoliang in spring and wheat in winter are the main crops of this region.

3. Winter wheat and coarse grains area: west of winter wheat and Kaoliang agricultural area. Loess is the part of soil located in. The Shensi plateau region generally has an altitude of 600 to 1,050 meters in this part; loess soil is found up to a depth of 150 meters. These soils are porous and retain more moisture; can keep for a long time. There is very little plain area in this area, only the valley of Wei Ho River which is about 320 kilometers long and 64 kilometers wide and the plain is 360 meters higher than the normal land. This and Fen Ho are irrigated areas where cotton is cultivated.

This entire area is located in Shensi and Shaanxi provinces. Agriculture is an important occupation in this area as the soil is fertile. Agriculture is done by making fields with altars on

the hill slopes. Winter wheat, sorghum, Cotton, cotton, maize etc. is cultivated. Two crops are grown on only 18 percent of the total area.

4. Yangtzi rice: wheat region: In the plains of this region, the marginal area of the southern part of the northern plain, the plain of Yangtisi and the highland regions are found in the plain. The Yangtze plain, with a density of 932 people per square kilometers, is the widest. Its width is 320 kilometers. At other places in this region the hills have come close to the river. Many lakes have formed on both sides of this river. Irrigation facility is available from rivers and lakes; Generally 150 cms in this region. It rains. Rainfall is evenly distributed throughout the year. The distribution of this rainfall has been decreasing towards the north; 75 cm in the marginal area. This is the annual average of rainfall.

Mostly only two crops are grown in this area. Rice or cotton is sown in the winter season and wheat, maize and barley in the winter season, but on some lands a third crop, vegetables, is also grown. 2/3 of this agricultural area is irrigated area. In this region, rice is mostly produced in the delta, river valley and southern part. This is the entire plain area where rice is produced due to irrigation facilities from rivers, ponds, canals and lakes. Wheat is the main crop in the inner valley region and northern and southern regions of this region. Cotton is grown in the coastal areas of this region where alkaline soils are found, which are not suitable for rice.

5. Jechawan Rice Field: Most of this area is hilly which more than 300 meters above normal ground level is. But in the north-western region, mountains up to 3,000 meters high are found and in the east, there are mountainous areas up to 2,400 meters high. The area is irrigated by the Yangtze River and its left tributaries, the Min Ho and the Kialig.

This entire hilly area is made of soft red sand stone. This red sandstone gets converted into red and purple soils due to weathering; hence this basin is also called 'Red Basin'. The entire Jechewan Basin or 'Red Basin' consists of the area irrigated by the Yangtze River and its left tributaries, the Min Ho and Kialing. The most extensive low plain is the Chengtu plain, which extends 112 kilometers from north to south and 80 kilometers across the Min Ho River. These mountains have provided protection to the Jechewan Basin from the cold continental winds coming from the north; hence the climate here is humid. Most of the rainfall occurs in spring but some rainfall occurs in every month. Agriculture is done in 20% of the area. The Chengtu plain has been irrigated by canals for two thousand years. The density of population is so high that by creating terraced fields on the hill slopes, slopes up to 45° have been made suitable for rice production. Rice is the main crop in this region during summer season. Wheat, corn, sweet potatoes and soybean crops are grown in the winter season.

6. Rice-Tea Region: Rice-tea region is spread in Sikyang, Kiangsi and Hunan provinces. It is a plateau part. 20 percent of the entire area is cultivable area; the remaining 80 percent is hilly of this region in the center and east there are 1,500 meter mountain ranges parallel to the coast. Rainfall is in sufficient quantity and continues throughout the year. Rice is produced in all the

lowland areas and tea is produced on the hill slopes. Sweet potato is the second important crop after rice.

7. Double crop rice area: This is a tropical region of China where the rainfall is 175 cms. it occurs. The entire region is mountainous, only 13 percent of the land is cultivable. The area is irrigated by the Sikyang and its tributaries. In the south, three crops of rice are produced every year. In the northern part of this region, two crops of rice and the third crop of vegetables are obtained. Other crops include rubber, coconut and banana.

8. South-Western Rice Region: This region is different from the southern rice producing regions of China, in this rice is produced in the summer season because the temperature in this region remains very low in the winter season and most of the part is plateau. The plateau of Yunnan is 1,800 meters above normal level and the height of the surface in Kweihow is 1,200 meters. Due to the land being fragmented and hilly, it is done only in the valleys. Rice is the main crop in these valleys. Millet, sorghum and beans are other produce.

In 1962, the Chinese Academy of Sciences provincial zed agriculture. The Academy of Sciences has included historical development and future variability in addition to the impacts of current land use and the natural environment. The Chinese Academy of Sciences has divided the entire Chinese agricultural region into the following four major regions, 12 secondary and 51 tertiary and 129 quaternary sub-regions according to diversity:

1. Northern dry agriculture and animal husbandry area.

- (a) North-eastern mono-crop dry agriculture and forest region,
- (b) Inner Mongolian monocrop dry agriculture and animal husbandry area,
- (c) Biennial three-crop dry agricultural region of northern China.

2. Southern Wetland Agricultural and Commercial Forest Region

- (a) Double crop rice and tropical forest regions of eastern and central China,
- (b) Double crop forest regional agricultural region of south-western highlands and valleys,
- (c) Three-crop wetland agriculture and tree fruit region of South China.

3. North-western dry and irrigated agricultural and animal husbandry regions

- (a) Single crop irrigated agriculture and animal husbandry region of Inner Mongolia and Ho-Xi,
- (b) Single crop irrigated agriculture and highland grazing region of Northern Siquang Tianshan,
- (c) Multi-crop irrigated agricultural region of Southern Sikyang.

4. Highland cold agriculture and animal husbandry region of Tsinghai-Tibet,
 - (a) Highland cold agriculture and animal husbandry region of Northern Tibet,
 - (b) Mixed agriculture and animal husbandry region of Tsinghai Tibet Plateau,
 - (c) Hot and humid agricultural and forest region of south-eastern Tibet plateau.

1. Northern Arid Agriculture and Animal Husbandry Region: The north-eastern part of China includes the area that encompasses the provinces of Shenyang, Shaanxi, Shensi, Shangdong Peninsula and the northern part of Hebei and Hunan. The climate here is dry. Winter is very harsh, the temperature remains below freezing point. In the winter season, rainfall occurs in the form of snowfall; hence the weather is very bad in the winter season. The temperature becomes high in summer. There is very little rainfall. The average rainfall in Beijing is 55 centimeters, 90 percent of which occurs from May to September. The main produce here is spring wheat and corn.

2. Southern Wetland Agricultural and Commercial Forest Region: The first humid region is situated in the south of the agricultural region where excess rainfall is found. There is sufficient rainfall in summer. Agriculture is in a more developed state. This region includes the central part of China (especially the lower valley of the Yangtze River). Sikyang, Kiangsi, Fuqin, parts of Kwangtung, Red Basin, southern part of Hubei and part of South China are included.

This is a more fertile part of China; the main crops here are rice and tea. The climate is moist and humid.

3. North-Western dry and irrigated agriculture and animal husbandry region: This agricultural region is Sikyang, thianshan and is spread in parts of Inner Mongolia. The climate here is dry; hence irrigation is required for agriculture is required. Water is supplied by rivers.

4. Singhai-Tibet highlands in the cold regions agriculture and animal husbandry areas: Tibet and Singhai mountain peaks are found in the south-western part. , There is a lot of difference in temperature between day and night. Due to high altitude this part is not useful for agriculture. Animal husbandry is the main occupation here. Agriculture is done by making terraced fields on the mountain slopes. In agriculture, rice, potatoes, radish, carrots are produced.

3. Agricultural sector of the Soviet Union

Dividing a huge country like the former Soviet Union into agricultural regions is a very difficult task, not only determining the boundaries of the regions but also displaying them on the map is even more difficult. In many economic geography books published in the former Soviet Union, the Soviet Union has been divided into 20 or 30 agricultural regions, but some authors have divided the former Soviet Union into the following four large agricultural regions and further divided them into sub-divisions:

1. Northern region of low agricultural value,

2. Main agricultural region,
3. Southern region of low agricultural value,
4. Southern region of high agricultural value.

1. Northern region of low agricultural value: This region is spread in the northern part of the Soviet Union. The area of this part is quite vast. It covers approximately 30 percent of the land area of the entire former Soviet Union. Here is lack of agriculture. Mostly the residents here do the business of animal husbandry, hunting and fishing. Permanent agriculture is practiced only in the central valley of the Lena and the valleys of its tributaries. Agriculture is done in very small areas. Due to various human occupations this region has been divided into the following two sub-divisions:

- (i) Reindeer herding, hunting and coastal fishing,
- (ii) Forest use and small-scale agriculture.

1. Reindeer herding, hunting and coastal fishing: The inhabitants of Siberia in the northern part keep roaming with their reindeer from one place to another for their fodder. These reindeer fulfill all the needs of these people. During the short spring season, tundra areas become excellent pastures for these animals. The residents of this area who do not rear reindeer are engaged in hunting and fishing. The climate of this region is affected by the cold with accumulation of snow for a long period of the year. Because of this it is not possible to do agriculture. Agriculture is practiced in small areas at some places in the valley of Lena and its tributaries. The Yakuts resident here is considered to be the first permanent farmers of Siberia. Food grains wheat, barley, oats and rye are produced in these agricultural areas. Apart from these, due to some natural pastures animal husbandry is done.

2. Forest use and small-scale agriculture: Towards the south, as the temperature starts increasing in spring, the area of land under agriculture increases. Food grains like wheat, rye, oat, barley etc. are produced. Along with these, potatoes and grass are also produced. Agriculture is of secondary importance in this area. Cutting wood, digging minerals and catching animals are the main occupations of this area. The cultivable land is small in size and scattered here and there. Agriculture is carried out near logging and mining areas. This region extends into a narrower part in Asia and a wider part west of the Urals. This means that the environment in Soviet Russia is more favorable for wood cutting etc.

The two above mentioned territories cover approximately half of the former Soviet Union which is of little or no agricultural value. Agricultural yield is absolutely low.

2. Main agricultural region: The main agricultural region of the former Soviet Union is situated to the south of the above two regions. This region has become wider in the west and narrower in the east. Various types of crops are grown in this area. This is due to the differences

in the geographical environment of this region. Increase of temperature in summer season from north to south, lengthening of growing season and decrease of rainfall from north-west to south-east are the main differences in physical environment due to which differences are found in agricultural crops. This region can be divided into the following three sub-divisions:

- (i) Food grains, flax and dairy business sectors,
- (ii) Food grain, sugarcane, potato, cattle and pig rearing areas, and
- (iii) Wheat and animal husbandry sector.

1. Food grain, flax and dairy business area: The food grain, flax and dairy business area is located in the northern part of the mixed broad-leaf forest north of the latitude of Moscow (56° N). The climate of this region is more favorable for food grain production. Soils are less fertile due to lack of good drainage. Rainfall is in sufficient quantity. The soil is found acidic. For this reason, rye is cultivated more. Although the area under rye is more but now the area under wheat is increasing. Oats and hay crops are grown for dairy animals. There are natural pastures in many areas. Flax is the second main crop. Flax quickly destroys the fertility of the land; hence flax is cultivated on the most fertile land. Potato crop is grown for human and animal consumption. Potato production has been going on since this century. In the west, the area of potato is increasing rapidly in place of flax. Pig farming is an important business in the West. In the eastern part root crops are grown to feed animals.

In this area, the land has not been fully utilized for agriculture that is why swamps or forests are found. Only 10 percent of the land in the northern region and 60 percent of the land in the southern region is cultivated.

2. Food grains, legumes, potatoes, cattle and piggery areas: This area is found in parts of mixed broadleaf forests from agricultural point of view, more heat and longer growing season are found in this area. Much of the area is suitable for food cultivation and much of the natural vegetation has been cleared. Agriculture is done in about 50 percent area. Flax is the main fiber crop of this region; in the south, where temperatures are higher, flax has been replaced by hemp. In the southern part, sugar beet is the main crop which is sown in crop rotation with wheat. Wheat is the more important crop in the southern part and barley and oats in the north. Potato crop is grown for animal fodder. Due to potato crop, animal husbandry business has developed. Pig farming is also an important business.

I and II above are mixed farming areas where both agriculture and animal husbandry are done together. Although food grains are cultivated here, this area is not of much importance for food grains as compared to the southern parts.

3. Wheat and animal husbandry sector: This sector is the most developed sector of agriculture. This region is no longer a part of the former Soviet Union but is part of Ukraine, a

nation that became independent from the Soviet Union in 1991. Its capital is Kove. It was also called the wheat region of the former Soviet Union. Ukraine is an important area of food grains and animal husbandry. If a straight line is drawn from north to south from the Volga to the area between the Black Sea and the Caspian Sea, then this line will divide the region into two parts. One part is in the west where the climate is favorable for agriculture, winter temperatures are high and the growing season is longer, whereas in the east this situation is found to a lesser extent. Agriculture had developed in the western part a long time ago. Therefore, it is divided into more intensive agriculture in the west and less intensive agriculture in the east.

The main crop of this region is wheat, although the yield per acre decreases towards the east. Winter wheat production is important west of the Volga River, but more spring wheat is produced east of the Dnieper River. Winter wheat is not grown east of the Volga River, indicating that the climate in the East is harsh for wheat production. Other food grains are also produced in this area. Beetroot and sunflower are the main crops. Beetroot is cultivated in the humid north-west and sunflower is cultivated in the eastern part. Due to animal fodder, the number of animals is found to be more. Animal husbandry is an important business in Ukraine.

Towards the Volga in the east and Crimea in the south, the agricultural area decreases and the importance of animal husbandry increases. , The southern arid parts are irrigated by the Don and rising Dnieper rivers. Most of the land in the western region of the Volga has come into agricultural use but there is little possibility of more land becoming cultivable. Spring wheat crop is obtained east of the Volga. In the northern part of the region where rainfall is high and certain, oats and rye are important crops. Dairy has also developed more in this area. Further south, where rainfall is less, the agricultural area decreases. Animals are mostly reared for sheep and meat. In the southern part, 400 lakh hectares of land between Siberia and Kazakhstan region was made cultivable is. In terms of production, this region is the second important food grain producing region after the newly independent nation Ukraine.

3. Southern region of low agricultural value: This region extends to the north and north-west region of Central Siberia and the Caspian Sea. The climate of this region is dry and continental. This area is not very important from the point of view of agricultural production. From the point of view of study, this region is also divided into two distinct sub-parts:

1. Desert and semi-desert animal husbandry areas,
2. Mountain animal husbandry area.

1. Animal husbandry in the desert and semi-desert areas: south-east decreases over the years. Desert and semi-desert conditions are found in central Siberia. There is a shortage of cultivable land. Natural pastures are less; most of the area is devoid of vegetation. This area is a nomadic pastoral area. Fleet farming is the main business here. Here the nomadic herders roam around for cattle grazing throughout the year and at the end of the year they return to the same place from where they started grazing animals. Kazak region is an excellent area for nomadic pastoralism.

2. Mountain Animal Husbandry Area: Mountainous areas with harsh climate and steep slopes are not useful for agriculture. Agriculture is limited to river valley areas only. Seasonal animal husbandry ranges from winter lowland areas to summer highland pastures. Dairy cattle are more important in the mountainous part of the Caucasus. Sheep are the main animal in the dry mountainous regions of Central Asia.

4. Southern regions of high agricultural value: More valuable agriculture is done in different parts of the Soviet Union. Fruit production in Moldavia - Rice and tea are produced in the subtropical climate in the southern parts and cotton is grown through irrigation in Central Asia. This agricultural sector is divided into the following three sub-parts:

- (i) Fruit and tobacco growing areas,
- (ii) Subtropical climate growing area, and
- (iii) Areas of irrigated agriculture.

1. Fruit and tobacco growing areas: Due to lack of local climatic conditions, fruits are grown under deep cultivation in many areas. Fifty percent of the Soviet Union's grapes are grown in Moldavia. Various types of fruits, pears, figs etc. are grown on the southern Crimean coast. Tobacco, fruits and vegetables are also produced in these areas. In the lower valley of Volga, fruits and vegetables are grown due to fertile alluvial soil and irrigation facilities.

2. Subtropical climate production areas: These areas are very small in comparison to other areas but they have an important place in the agriculture of the country. Juicy fruits, tea, tobacco, maize and vegetables are grown in these southern parts of the subtropical climate. This type of crop is grown in the Caucasus and Crimea.

3. Areas of irrigated agriculture: Agriculture has been developed in the dry regions of Trans-Caucasia, in parts of the mountain basin of Central Asia, in river valleys and in desert areas where irrigation facilities are available. The main produce of this entire irrigated agricultural region is cotton, but rice, fruits, tobacco, grapes etc. are cultivated in large quantities in this area. Along with the crop rotation in cotton, Lucern grass is grown from which animals are reared - the Karakul breed of sheep here is considered to be of the best quality.

Agricultural regions of India

Dr. Cressey says that "In no country are more people dependent on rain than we are in India because even the slightest change in seasonal rainfall affects the prosperity of the entire country." Distribution of rainfall, temperature, altitude above sea level, latitude, natural vegetation, soil, crops, animals, species etc. all have important effects in determining the nature of agriculture and agricultural areas, keeping all these impacts in mind, one important fact that has emerged is that there are problems related to crop production in different parts of the country or similarity is also found in the condition of agriculture.

Efforts have been made by many scholars to divide India into agricultural regions. Among these, Dr. Starr Prof. The names of Sipkins and Dr. Spate are particularly noteworthy. All of them have considered topography, climate and population density as the basis for determining agricultural areas. Dr. Chan Hon Sang has divided the entire country into 16 major parts, considering the topography and situation, agriculture, social system, pattern of crops, land rent system and general economic development as the main elements in the classification of agricultural regions. Dr. Thorner has divided the country into many agricultural regions from the point of view of agricultural planning and management. One classification includes those crop areas which are related to the production plans of the main crops. In the second classification, all the facts of agricultural planning of the agro-climatic region have been taken into account. According to crop planning, crop regions have been formed as follows - India's cotton region (6), groundnut region (10), sugarcane region (8), maize region (7), coir region (9), cotton region (12), coarse grains region (14), pulses region (13) and oilseed region (13). Thus, the total number of crop regions according to Dr. Thorner is 13. According to agro-climatic region demarcation, Thorner has divided India into 3 major agricultural regions, 10 sub-agricultural regions and 52 crop-specific regions.

Here, a simplified classification of agricultural regions has been presented, explaining the much-discussed agricultural regions of Indian agricultural scholars, especially the classification of Dr. Randhawa and Dr. Sen Gupta.

According to agricultural expert Dr. Randhawa, India can be divided into 5 major agricultural regions. These are as follows: (1) Temperate Himalayan region, (2) Northern dry region, (3) Eastern plain region, (4) Western coastal plain region, and (5) Southern Region.

1. Temperate Himalayan Region: This region has been divided into two sub-divisions (a) Eastern Himalayan Region. It includes the hilly part of Arunachal, Upper Assam and Sikkim. Due to rainfall of more than 250 cm, dense forests are found here. Tea and rice are mainly produced in this area. (b) Western Himalayan region: It includes Kumaon, Garhwal, Shimla hills, and Jammu and Kashmir and Himalayan region. The climate here is mostly semi-arid. In the northern parts of this region it rains or snows in winter. Fruits like apple, pear, cherry, grapefruit, almond; grapes etc. are especially grown here. Potatoes, maize and rice are other crops in the region. Sheep and goat rearing is the main or subsidiary business here. Grain and meat are obtained from this. Beekeeping is also done to obtain honey. Now irrigated agriculture is developed here.

2. Northern Dry or Wheat Region: This region includes Punjab, Haryana, Delhi, Northern Gujarat, Western Uttar Pradesh, Rajasthan and Madhya Pradesh. The rainfall in this area is less than 75 cms. In desert areas the rainfall is less than 20 cms. Sand and coal are especially found in the soil. Wheat and rice are produced at all places with the help of irrigation. This is the main wheat region of India. Cotton, barley, gram, maize, jowar-millet are other subsidiary crops. Horses, camels, sheep, goats and cattle are the main animals here. Here good breed cows, bulls;

Murrah buffaloes, horses and sheep are reared. Chaff, grass and improved animal feed are fed to milch animals.

3. Eastern Wet or Rice Region: This includes Assam, Meghalay, Uttar Pradesh, Tripura, Manipur, West Bengal, Bihar, Jharkhand, Orissa, Eastern Uttar Pradesh, Eastern Andhra Pradesh, Tamil Nadu, and Chhattisgarh. The rainfall here is 150 cms or more. This is found. The main crop of this area is Paddy. Among the other crops, sugarcane, jute and tea are locally more important than the clay soil in the area. There is very less area under fodder, hence the animals here like buffalo etc. are of poor quality.

4. Western Wet or Malabar Region: This belt extends from Mumbai to Kanya-kumari. In the coastal parts of Kerala, Karnataka and Maharashtra the rainfall is 250 centimeters or more. Literate soil is mostly found here. Here, more plantation crops are produced in which coconut, cashew, kahwa, tea, pineapple, tapioca, betel nut; garam masala, rubber etc. are the main ones. Rice is the main food grain here.

5. Southern Medium Rainfall or Millet Region: This region includes Southern Northern Pradesh, Southern Gujarat, Western Madhya Pradesh, Eastern Maharashtra and most of Karnataka. The rainfall here is only 50 cm to 75 cm because these regions mostly fall in shadow areas. Here black lava soil, laterite and at some places kaap soil are found. Here mainly cotton, groundnut, rice, sugarcane, jowar, millet, ragi, castor, pulses etc. are produced. Sheep are found in abundance in this region. The wool obtained from them is usually of poor quality. Now silk with the help of mulberry farming has also started developing rapidly.

Agricultural Regions of Sen Gupta and Dayuk.

Pro. Sen Gupta and Dayuk have also presented the classification of agricultural regions. In this, the country has been divided into four major states and 25 macro and 60 micro states. The main states are as follows:

1. Himalayan Zone: This zone includes Jammu-Kashmir, Himachal Pradesh, Kumaon, Himalayan and Foot hill Piedmant Zone, Darjeeling district of West Bengal, Assam, Himachal and Arunachal Pradesh. Here the rainfall is 125 to 250 cms throughout the year. Most of the hilly areas are of negligible importance from the point of view of agriculture and settlement. Agriculture is done on 7 percent of the state. Wheat, maize, rice, potato are the main crops of this region. Juicy fruits are specially produced.

2. Eastern and Humid Coastal Zones: This zone extends from North-Eastern and Central Peninsular Plateau, Manipur, Mizoram, Khasi, Garo, Jaintia, Mikir Hills, North Kachhar, Nagaland to Central Madhya Pradesh are units. This includes the Ganga delta, the plains of Assam and the entire coastal area. The rainfall here is 100 to 125 centimeters. Crops generally do not require irrigation. Rice is the main crop of this section. Other important crops are tea, jute, sugarcane, wheat, oilseeds, gram, garam masala, coconut, palm, rubber, banana, jackfruit etc.

3. Sub-Humid Region: This section includes upper and middle Ganga plains, Terai, West Bihar, adjoining Bundelkhand in peninsular India, eastern coastal region, Malwa, south-eastern Maharashtra, northern and southern Telangana, Karnataka, Tamil Nadu, Wardha river basin, upper Tapi river valley, Karnataka, Malnad and plain areas, most of the coast of Andhra Pradesh, Krishna-Godavari delta, Tamil Nadu coast etc. units have been included in it. The rainfall here ranges from 75 to 100 centimeters. With the availability of irrigation facilities, the agricultural sector has started expanding rapidly. Agriculture is practiced on 70 percent of the land in the coastal areas and the Ganga plain. Sugarcane, rice, wheat, jute, maize, groundnut, cotton, oilseeds and tobacco are the main crops here.

4. Dry Zone: This zone includes the plains of Punjab and Haryana, western Uttar Pradesh, the desert of Rajasthan, Saurashtra and Kutch peninsula of Gujarat, the eastern rain shadow area of the Western Ghats. The rainfall here is less than 75 centimeters. There is shortage of water almost everywhere. Agriculture is possible only in irrigated areas. Therefore, in addition to the cultivation of jowar, millet, coarse grains, gram and oilseeds, wheat, cotton, groundnut, maize, peas, spices, pulses etc. are grown here when water is available.

In short, keeping in mind the intensity and special characteristics of crop rotation and their basic effective elements, topography, temperature, rainfall and moisture, water supply through artificial means, soil, population density, economic condition and other factors and available facilities, Indian Agricultural regions can be broadly classified as follows

1. Fruit and Vegetable Regions: In this region, alluvial rocks, especially coppice and sand mixed or coppice and clay mixed soils, are found. As we move from west to east the rainfall increases from 50 cm to 250 cm. The temperature here is 30°C. to 40°C. It lasts for 9 to 10 months in the middle of the year. Due to both the seasons (summer and winter) here, its importance increases due to the cultivation of fruits in the mountain and western spears. The fruits and dry fruits of the country are found in the mountainous parts of Kashmir, Himachal Pradesh, Eastern Punjab, i.e. the temperate mountainous parts of Western India. Here apple, pear, shaftalou, cherry, plum, grapes, snake gourd, apricot, betel leaf producing areas and almonds, walnuts, pine nuts, dry grapes are grown far and wide. The expansion of their agriculture depends on the development of transportation means. Orange, sweet lime, guava, litchi, plum, mango, pineapple and banana are produced in eastern India. Apart from this, the cultivation of non-perishable vegetables like potato, chilli, ridge gourd, okra, tinda, gourd, arbi, cabbage, pea, cucumber, ground beef and other vegetables is continuously expanding in the West. All the cities of North-West India and Eastern India are their consumption areas. In these parts, with the help of highways and railways, India agricultural region paddy fields

In many areas, the production of fruits and vegetables is increasing rapidly due to well-organized method. Most of the metros of the country are within 150 to 400 km. Vegetables from a distance of 600 km. get fruits from a distance greater than forest area tide Millet are there. In this view, the efforts made for the development of fruit agriculture in Garhwal and Kumaon

districts of Uttar Pradesh are commendable. Here, along with agriculture, importance is being given to vegetables, fruit orchards, animal husbandry and allied activities. The valley of Kashmir and Jammu, Punjab and its people are special in this state through research and development. Its area is being increased in the hilly parts of Uttar Pradesh and the hilly parts of the Far East, Assam and Nagaland. In these hilly regions, apple, grapes, pear, orange, mango, sapota, potato, cabbage, chilli, tomato, bitter gourd, By improving the varieties of beans and peas, their yield has been increased.

(2) Rice, Jute and Tea Region – Obviously this part is a part with humid climate. Here the rainfall is more than a centimeter and the average highest temperature in summer is generally 200 34 degrees Celsius. Live higher than. Here the fertile and porous soils keep getting renewed every year. The main crop of this state is rice. In most of the places two crops of rice are taken in a year and in some places even three crops are taken she goes. The Brahmaputra valley, Ganga delta and lower valley and Malabar are the major rice regions of India.

Apart from rice, world famous tea gardens are found in Upper Assam, Tripura and North Bengal. Jute is an important crop in entire West Bengal and Far-East. Apart from this, this area is also famous in India for mustard and smooth betel nuts. Among the fruits here, mango, jackfruit, banana, pineapple, orange (in Assam), dates, cardamom, litchi, guava are also grown. The coast of Kerala is famous for the production of rubber, garam masala, pineapple and plateaux, kahwa, cashew, mango, sapota, orange, coconut, banana and tea. In this state, a three-pronged pattern of crops is found including general crops, garden crops, currency crops and fruits and vegetables. Irrigation has importance only locally or during pre-rainy season. The land also has to be fertilized less due to annual floods.

The entire eastern India, the Terai region and the western coastal plains are included in this region.

(3) Wheat-Sugar Region – There is a considerable difference in the temperature of summer and winter in the interior parts of the country. Summers are hot and winters are cool and sometimes cold. Most of the rainfall is confined to the period from June 15 to September. Although in some parts, there are bountiful rains during winter. For this reason irrigation is an important necessity in all parts. Irrigation is usually done through wells and canals. Different types of soils are found here. It can be a mixture of sand, copra, clay, red, deep, loamy, black and lava.

According to climate and availability of water, usually two crops (AB and Kharif) are grown. Javad, the third crop in summer, is also grown through irrigation. Sowing of various types of crops and alternating sowing of crops is a notable feature here. In the areas with more water, wheat, sugarcane and rice are mainly grown, while in the western parts wheat, gram, cotton, pulses, mustard, maize and sugarcane are sown. Maize, coarse grains, barley, oilseeds, pulses etc. are shown on less fertile, hilly lands etc. The main wheat area of India is located here. t is. it. The region extends from north-western Uttar Pradesh to Punjab, Haryana, Rajasthan, northern

Gujarat, western Madhya Pradesh, Central India and Malwa plateau. This region is also a developed dairy sector of the country. Therefore, green grass is also sown in abundance here. Fruits include mango, guava, papaya, sapota, orange, plum, apple in western parts, grapes, pear, orange, banana, mango, litchi in eastern parts and various types of groundnut, potato, tomato, cabbage, peas and many others in all parts. Seasonal vegetables are produced. A very good system is available to send all such goods immediately from highways to cities and metros through trucks.

(4) Millets and Oilseed Region of South – Red, yellow and laterite soils are found in this region. These soils are coarse grained. The temperatures here remain high throughout the year. The remaining rye is between 180 centimeters. This region is one of the famine prone areas of Southern India.

Due to infertile soil, low rainfall and high temperature in this area, mainly jowar, millet, and rice are grown. Crops like Ragi, Lime, Taramira, Randi etc. are grown. In the valley of rivers where the soil is fine and desolate and where water is available, cotton, pulses, groundnuts and, in some places, rice are grown. 16 cashew nuts in Karnataka Gardens have been developed in lakh hectares of land. Among the fruits, good varieties of mango, seasonal orange, sapota, banana, pear, cashew, various types of precious rose, agni (lemon), grasses etc. are produced. Small gardens of Kahwa, Tea, Cinchona, Cashew, Garam Masala etc. have been developed on those slopes. This region includes central and western Tamil Nadu, Andhra Pradesh, Karnataka plateau, southern Maharashtra and South Madhya Pradesh is included.

(5) Maize and Coarse Grain Crop Region of North - This is the dry region of India. There are obviously two seasons here, summer and winter. Daily and summer temperatures remain very high. Rainfall is 50 centimeters or less. The soils are light in the east, loamy and mixed with fine sand in the latter. In this part, agricultural work and water availability are closely related to each other. They are obtained mainly from wells and small dams. Agriculture is mainly practiced in seasonal river valleys, those but it is near the ponds and wells built there.

Maize, barley, gram, wheat, urad, jowar, cotton, groundnut, rice, cucumber and other seasonal vegetables in the Mewar plateau, Dhundhar and Uparmal (central-eastern Rajasthan) and rice in the southern parts, Hadoti plateau and Bharatpur. , sugarcane and cotton are produced. Hadoti plateau is famous for orange. Jowar, millet, moong, moong, sesame, matira and ragi are grown in the western, unirrigated parts of the dry and semi-arid Aravalli. In Shekhawati, gram, wheat and barley are grown and in Luni valley, wheat, cotton, pulses, sesame etc. are grown with the help of irrigation. With the development of canals, northern and western Rajasthan is becoming the granary of the state. Here maize, green grass, sugarcane, rice, wheat, beetroot, gram, peas, other pulses, groundnut, mustard and mustard, long fiber cotton, mustard, malta, fruits, lemon, grapes, raisins of all types of seasonal and winter crops are grown. Vegetables are grown in abundance. , Due to dry and hot climate, less grasslands are found in the western part, yet this region is famous in India for the best breed of cows and cattle. Best breed

in North Rajasthan and Shekhawati Murrah buffaloes are available. Camels, sheep, goats are other domesticated animals.

This region extends to most of Rajasthan, Haryana and nearby Gujarat. rain here 60 Is less than a centimeter.

(6) Cotton Region - India's famous cotton region is spread in the lava soil region on the southern plateau. The soil here is dark colored and smooth. According to the importance of the crop, it is also called 'black soil region of cotton'. The rainfall here ranges from 60 to 100 centimeters. The temperature is 24°C throughout the year. Live higher than. Irrigation facilities are being developed rapidly in the river valleys. Apart from cotton, sugarcane is also produced in large quantities here. Better quality sugarcane is produced here than in North India. Castor, groundnut, gram, sesame, jowar, millet and towards the north wheat are other notable crops. Banana is grown extensively in the northern part where rainfall is 100 cm or more.

The Planning Commission has divided India into 15 agro-climatic regions and proposed special crop patterns for each region. The national format of these regions and countries. Hence these are natural. Continue to be at the forefront of planning exam question

7.4.1 CHARACTERISTICS OF INDUSTRIAL REGIONS

The following characteristics are found in any industrial region:

- (1) The number of industries is more in industrial areas. The number of industries indicates the prominence of industries.
- (2) Most of the population of industrial areas is engaged in construction industries. Agriculture and other primary production activities are negligible here.
- (3) There is mutual relationship between the products of factories located in industrial areas.
- (4) The majority of the urban population is in industrial areas. Where a factory is established, the people living there gradually expand their residences and turn it into a city. Their businesses are also related to industries.
- (5) The distribution of industrial units in an industrial region is dense. ,
- (6) Means of transportation are well developed in industrial areas. In this way factories are interconnected with means of transportation.
- (7) In industrial areas, the density of population decreases towards the outside of the urban area.
- (8) Cultivable land in industrial areas is used for vegetables and dairy animal husbandry. Grains are not grown here. Milk and vegetables cannot be brought from long distances in urban centers. That's why they are produced here.

(9) Factories, smoke-emitting chimneys, rows of houses, industrial waste, finished goods and means of transportation are visible all around in the industrial region.

(10) All types of power resources are used in industrial areas.

Delimitation of Industrial Region - Delimitation of any industrial area is a complex problem because many industrial areas have expanded at such a rapid pace, that their defined boundaries have become endangered. These boundaries are mainly based on the amount or level of industrialization and regional expansion. Areas with similar levels of industrialization are called industrial regions, but different approaches are used to determine the level of industrialization. Demarcation of industrial area can have the following basis.

(1) Number of factories: Number of factories is the most common parameter showing the level of industrialization in different areas. The number of factories located in an administrative unit can be easily determined. Due to the same number of factories in two different areas, the level of industrialization cannot be considered equal, but there can be difference in production from one factory to another. In this, the importance of a factory with 10 workers can be equal to that of a factory with 500 workers because once the limit is reached; it becomes entitled to get all the facilities even if the capacity of the factories is many times more than the other. On the other hand, in terms of the volume level of industrialization, factories with equal production and capacity can never be of equal importance.

(2) Number of Employees: To remove the inherent disparity in the number of factories, the number of employees engaged in industries can be used to determine the amount and level of industrialization. It is also well known that even if the number of employees is equal, the production in any two factories cannot be equal, but the number of employees is clearly an indication of what the level of industrialization is. This is therefore an important fact.

(3) Number of people engaged in production: Under this, only those people are taken who are directly engaged in the process of production. People who work in offices as clerks, administrators or researchers are not counted. But this fact is controversial because these people indirectly contribute to production and if they are removed, production is not possible.

(4) The proportion of workers engaged in industries in the total population: What percentage of the total population of any area is employed in industries as workers, it shows the ratio of occupations of the people of that area. A direct way to assess the level of industrialization is to find out what percentage of people are employed in different industries, for example, out of 100 people in one area, 90 are employed in one industry i.e. 90 percent, while 1,000 in another area are employed. Of the people employed, only 50 percent are in 500 industries. In this way the level of industrialization can be clearly assessed.

(5) Amount of energy: Some scholars say that the amount of energy in the industry is an accurate assessment of the levels because the number of workers produces large quantities.

Industries that use more mechanical power become more important because energy use depends on mechanical power. Therefore, this can be considered a good and appropriate parameter of industrialization.

(6) Total industrial production: The level of industrialization can also be determined from the quantity of total production, but due to the production of different goods in different units, it is difficult to convert them into equal units. Cloth is produced in one factory and steel is produced in another. It is difficult to compare these two items on the same level. Comparison of production of similar items is possible.

(7) Price related data: The level of industrialization can be assessed by obtaining details of prices of manufactured goods, but even here there is a difference between raw and finished goods because sometimes the same item is manufactured in several factories, then the final form is obtained. Its value lies with the factories. Thus it is clear that it can be the basis for measuring industrialization. Where an item is completely manufactured in a single factory and there is no variation in it.

(8) Value addition due to production process: The most useful measure of the level of industrialization is value addition due to production process. This is done by removing the value of the raw materials used in any industry from the value of the goods produced in it. This is a symbol of the meaningfulness of the work. This provides accurate measurement of efficiency and levels.

On the basis of the above facts, the limits of industrialization can be determined, but some basic difficulties arise, yet their level and quantity can be assessed.

7.4.2 INDUSTRIAL REGIONS OF THE WORLD

The development and expansion of modern industries is important in itself. Along with their development in a region, expansion and growth of boundaries have been synonymous with each other. First of all, the western countries of the world moved further towards industrialization and gave birth to an industrial culture which gradually started spreading in the eastern countries. Natural resources (wealth) and industrial policy gave rise to the Industrial Revolution in Western Europe, which gradually influenced other areas of the world and moved towards industrialization. Thus, industrialization happened rapidly in some countries and slowly in others. In this way stratification took place in industrial areas. Some became first class industrial regions and some became second class.

Following are the first and second class industrial regions:

First class industrial area

(1) Eastern Industrial Region of North America,

- (2) Western and Central Europe,
- (3) Eastern Europe and Western Soviet Union,
- (4) Eastern and Southern Asia.

Second class industrial area

- (1) Southern United States,
- (2) Western Anglo America,
- (3) Central America,
- (4) West Central Latin America,
- (5) Middle Chiloé.

1. INDUSTRIAL REGIONS OF THE UNITED STATES

The United States of America is an important country in the world in terms of industrial development. There has been immense industrial development in this country due to availability of minerals like iron ore, coal, mineral oil etc. and agricultural and forest produce items necessary for many industrial production in sufficient quantity, but all this industrial development has taken place in the north-eastern part of this country. . The following are the major industrial sectors of the United States:

- (i) New England Industrial Region,
- (ii) Mid & Western New York Industrial Region
- (iii) Mid Atlantic Coastal Industrial Region,
- (iv) Pennsylvania-Ohio Industrial Region,
- (v) West Virginia Industrial Region,
- (vi) South-Eastern Michigan Industrial Region,
- (vii) Lake Michigan Industrial Region,
- (viii) Mid-interior Industrial Region
- (ix) Southern Appalachian Industrial Region,
- (x) Other Industrial Centers

New England Industrial Region

England is the most important industrial region of the United States. Europeans were the first to settle in this country and established these industries. This area has been industry-oriented since the beginning.

The region includes the states of Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine. Industries related to textile manufacturing from cotton, woolen and artificial threads, machine tools, textile manufacturing machines, electrical machines, motor vehicles, ships, leather goods, rubber, aircraft equipment, paper etc. have been established in this state.

There are three specific industrial areas throughout New England:

(a) Eastern New England: The eastern part of the state of Massachusetts falls in this region where Salem, Lynn, Boston, Quincy, Boston Pawtucket, Providence, Manchester Nashua, Laval, Lawrence Haver Hill, Barcester etc. are the major industrial cities. Industries of leather, shipbuilding, textile manufacturing machines, etc. are established in Boston.

(1) New England Industrial Region, (2) Central and Western New York Industrial Region, (3) Central and Other Ocean State Industrial Region, (4) Pennsylvania-Ohio Industrial Region, (5) West Virginia Industrial Region (6) South-Eastern Michigan Industrial Region (7) Lake Michigan Industrial Region (8) Central Interior Industrial Region, (5) S. Appalachian Industrial Region (10) Other Industrial Regions - (a) Gulf Coastal, (b) California Martyr and (c) Western Pacific Coastal Industrial Region.

(i) The textile industry is most concentrated in New Bedford. Apart from textiles, this also includes the industry of making machines. in the valley of the merrimack Leather, woolen, cotton and silk industries have been developed. Worcester is a major industrial city in Massachusetts where metallurgical and mechanical industries have been established.

(a) Northern New England: Maine, the northernmost state of New England, is famous for its lakes.

(b) Western New England: The nation located west of the Connecticut Valley, and the western part of the state of Massachusetts, are part of this industrial region. The main industries of this industrial region are textiles, paper, copper and brass goods, cutlery goods etc.

(c) Southern New England: This is still an important industrial area of the country. It is declining, but new industries are developing. There are various types of industries here. Although, the textile industry (cotton and woolen textiles) is still prevalent in southern New England, Is the main industry. Rhode Island, Fall River and New Bedford are centers of industry. Various types of electrical equipment, electronic plants, various types of machines and new

industries have been established in this area. There are about 17 cities in southern New England in which industrialization has occurred at a rapid pace. The main ones are Boston, Providence, Hartford and Springfield-Holyoke.

(ii) Mid & Western New York Industrial Region

This industrial area extended west from New England to Lakes Erie and Ontario in New York State. This industrial area stretches west from the Mohawk, Hudson, and Champlin valleys. Heavy industry is found in abundance in this area.

The most important industries in the New York metropolitan area are textile manufacturing, printing and publishing. All 17 percent of the workers in this region are engaged in the textile manufacturing industry. Other major industries include electrical equipment, chemical machines, transportation equipment, and manufacturing industries. Allegheny is a major center for the manufacturing of machines, electrical equipment, and textiles. General Electric Company is headquartered in Schenectady. Electrical equipment is manufactured here. Utica-Rome, at the western end of the Mohawk Valley, established machinery, pottery, textile and paper industries.

Various types of industries have developed in New York. A variety of small industries have been established on Manhattan Island, of which the textile manufacturing industry is important. The paper manufacturing industry is an industry of great importance in northern New York State. Aircraft manufacturing and railway equipment manufacturing industries have also developed more in this region. Patterson, the major city of silk textile industry, is situated in this area.

(iii) Mid Atlantic Coastal Industrial Region

It is an important industrial area of the United States. It extends along the Atlantic coast from New York to Baltimore. This industrial region includes parts of Eastern New York, New Jersey, Eastern Pennsylvania, Maryland, and Eastern Virginia. A variety of industries have developed here.

(A) Machine manufacturing industry: Machine manufacturing industry has developed the most in this region in which 13 industries are engaged in this state various types of electrical equipment like batteries, radio, cable wires, transformers, generator sets, telephones etc.

(B) Iron steel: Iron and Steel Iron and steel industries have been established in Bethlehem and Sparrows Point.

(c) Textile Industry: Cotton, silk and synthetic fabrics are manufactured here - Patterson, Newark, Jersey City, New brunswick are the main centers of this industry.

(1) **New York:** New York and its suburbs are an important industrial area where ready-made garments, hosiery, chemicals, electrical equipment, machines etc. are established.

(2) **Philadelphia:** Industries related to machines, textiles, stone refining, shipbuilding are established in Philadelphia.

(3) **Baltimore:** Industrial areas of the world: Industries of iron, steel, heavy industry machinery, etc. are found in abundance in the Baltimore region.

(iv) Pennsylvania Ohio Industrial Region: Pennsylvania Ohio Industrial Region is the main iron-steel industry area of the United States, which was developed on the iron ore and coal obtained from the state of Pennsylvania, but currently iron ore is produced from the Mesabi area of Iron Ore Lake. The ore has been kept close. The United States has the following three main industrial sectors of the country:

(a) Pittsburgh-Youngstown Industrial Area: Iron and steel industry has developed here. This industry has been developed on local coal and iron ore obtained from the lake areas. Iron and steel was established in this area from the very beginning. 25% of the country's cast iron and steel is produced here. Other major iron and steel industries established near Munhall, Rankin, Beddock and Duson, McKeesport, Pittsburgh.

Metal manufacturing industries were established in Youngstown, Warren, and Sharon in the Mahoning-Shenango Valley. Pittsburgh-Mangerstown is the largest iron-steel complex in the world.

(b) Cleveland area: Located on the eastern shore of Lake Erie, this city is the center of industries related to making iron-steel, heavy industry machines, and electrical equipment. Its iron and steel industries are located in the Brigcreek valleys.

The following are the factors responsible for the growth of this industry:

(1) Due to cheap transportation facility through lakes, iron ore is easily transported from the lake.

2) Coal from the nearby state of Pennsylvania is reached by rail. ,

(3) Sufficient amount of water is available nearby.

(4) Due to the presence of iron and steel fields nearby, skilled workers are available in sufficient quantity.

A part from iron and steel, various types of machines, motor vehicles and chemical industries are also established here.

(c) **Other centers:** Various types of industries have also been established in other cities like Canton, Laurens, Erie, Akron, etc. Industries of machines, tools, electrical equipment, mineral machines and rubber products are established.

(v) **West Virginia Industrial Region:** The Kanawha Valley in central West Virginia has seen more industrial development. Various types of chemical industries based on coal and coke have been established here. Industries in this area have developed due to adequate facilities of water, coal and hydropower. Henderson, Tricolor Buffalo, Dunbar, Charleston, Malden and Belle are the main industrial cities of this valley. Beyond this valley, Parkersburg and Clasburg are other industrial cities.

(vi) **South-Eastern Michigan Industrial Region:** This industrial region extends into the states of Michigan in the west of Lake Erie and Ohio in the south. This area is world famous in the motor vehicle industry. Detroit, located on the west shore of Lake Erie, is a major center of the motor industry. Metal manufacturing and electric motor industries have also been established here.

Toledo, on the southwestern tip of Lake Erie, is the second largest industrial city in the region, where steel industrial machines, electrical equipment, and metal manufacturing industries have been established. Michigan State (Flint), Pontiac Lansing; All cities are major centers of motor industry. Water, leather, electrical equipment and other important industries have been established in this area.

(vii) Lake Michigan Industrial Region

It is the second most important industrial area after the Central Atlantic Coast Industrial Region. This is the second important industrial region of the country in terms of number of workers and number of industries.

All types of light and heavy industries have been established here. These industries are spread across Lake Michigan and the state of Wisconsin.

Chicago, Milwaukee, Rockford, South wend, Muskegon and Gary are the main industrial cities. In Chicago, iron and steel, cloth making, meat packing and furniture making are done here. Industries manufacturing machines from steel, mineral equipment and agricultural equipment were also established here. Material, construction industry, telephone, transmitter and radio related industries also developed in this area.

Milwaukee: is a city located on the western shore of Lake Michigan, north of Chicago. Machine manufacturing is an important industry here. Meat packing, bakery, leather, dyeing and printing industries are established. Among other cities, Madison is famous for resin and machine manufacturing.

(viii) Mid Interior Industrial Region:

South of the Lake Michigan Industrial Region, it is the third most important industrial region of the United States, spanning the states of Ohio, Indiana and Illinois. In this area, various industrial units have been established in coal, sand stone, and development of means of water transport, minerals and excessive production of agricultural produce.

Various industries have developed in cities like Columbus, Dayton etc. of Ohio State. Here aluminum products, machinery for transport vehicles, cigarettes, agricultural equipment etc. are made.

Many types of food related industries have developed in the cities of Richmond, Indiana, Peoria and Springfield of Indiana and Illinois. Manufacturing of sugar from sugar beet, production of maize and corn, motor and airplane parts and equipment related to mineral industry is mostly done in this area.

(ix) Southern Appalachian Industrial Region:

Located in the state of Southern Alabama, where an iron industry has also been established based on local iron ore and coal. Here this industry is established in the cities of Birmingham, Fairfield and Bessemer. Modern machines and metal manufacturing industries have also been established. Textile manufacturing and chemical industries have been licensed in this area.

(x) Other Industrial Centers:

St. Louis, Memphis, and Cary are the main industrial cities of the Mississippi Valley. Food related industries, wood and textile manufacturing industries have been established. Aluminum, agricultural equipment, machinery, and electrical

Agricultural machinery, fertilizers, industrial machinery, electrical machines and textile manufacturing industries are important in Sentpal. The food, petrochemical, primary metals, wooden furniture, coffee and tobacco industries are important in the industrial cities of the coastal belt. The cotton textile industry developed in cities east of the Mississippi Delta.

The major cities of this region are Houston, New Orleans, Beaumont and Baton Rouge, which are famous for diverse industries.

Due to its belonging to the Gulf coastal and Pacific coastal areas: Due to its high production of forest resources and fruits, it was established in the Pacific Ocean coastal states of California, Washington and Oregon.

Lumber, paper and pulp industries were established in Ceredigion, Seattle. Fruit canning, film manufacturing, cotton textile manufacturing, and shipbuilding industries were established in California. The major industrial centers there are Los Angeles, San Francisco etc.

2. INDUSTRIAL REGIONS OF JAPAN

In Japan, industries have developed only in the most densely populated areas. There is abundance of both cheap labor and markets. Coal, silk and hydroelectric powers are also available in this area and most of the major ports of Japan are located here through which international trade is conducted. These ports facilitate export of finished goods and import of raw materials (iron ore, cotton, wool, etc.). Honshu is the main industrial island of Japan. This recent industrial area relocated from Tokyo, Japan's major industrial center. Hundreds of factories are found in this belt spread over an area of 960 km, located in the entire industrial area south of Kyushudweep. Big cities are situated on both sides of the sea. 80 percent of Japan's working population and laborers work in this belt. 75 percent of the country's cast iron and 90 percent of steel are produced in this region. Here cotton, silk, and artificial fiber textiles, chemicals, pencils, pulp, chemicals, matchsticks, china utensils, glass, rubber, leather etc. Industries are also concentrated.

Japan in the following five industrial regions, can be done:

- (1) Tokyo-Yakohama Prefecture,
- (2) Nagoya Industrial Region,
- (3) Kobe-Osaka Industrial Region,
- (4) Nagasaki-Mauji Industrial Region,

(1) Tokyo-Yakohama: Tokyo-Yakohama This industrial zone is spread across the three major prefectures of Kanazawa, Saitama and Chiba along the shores of Tokyo Bay. All industrial areas surround this part of the Quanto plain - (i) many fast-moving rivers flow in this plain, from which cheap hydro-electricity is obtained. This cheap hydropower provides industrial fuel for these industries. (ii) Yokohama and Tokyo, located on Tokyo Bay, are major ports that facilitate the import of raw materials and export of manufactured goods. (iii) Silk is produced in the hinterland of this industrial area; hence many factories have been established for the production of silk fabric. 'Nippon Steel Corporation' factory is located in China. Another major industry 'Kawasaki Steel Corporation' is also located in this industrial area. Other industries such as electrical machines, metal manufacturing and refining, shipbuilding, petrochemical and chemical industries have been established here. The main centers of heavy industries are established in Chiba, Tokyo, Yakohama, Kawasaki, Kawatachi, Omiya. In light industries, industries manufacturing plastics, wood, rubber, decorative items, food items, porcelain, fashion items, leather goods, toys and textiles have been established. These types of industries are found

throughout the region but the highest concentrations are found in Tachikawa, Tanawa, Tokyo, Kawaguchi, Ichikawa, Shoshiwara. Yokohama shipbuilding industry, aircraft manufacturing industry Tachikawa, Tanawa, machine tools, railways Kawaguchi, Tokyo, Yokohama, Hitachi and Omiya are the main.

Presently this industrial area is being expanded more in Chhiba Peninsula.

(2) Nagoya Industrial Region or Chuky Tokai Region - This industrial zone is located on the banks of a narrow and shallow river called Gifu, Aichi and Mie in the south of Honshu island of Japan. Mi) Prefecture and to the east, the coastal part of Suruga Bay extends into Shizuoka Prefecture. This is the third important industrial area of Japan. Here 10 percent production is industrial. 6 percent of the country's woolen clothes are manufactured here. Due to shortage of coal and other industrial fuels, most of the light industries have been established which are mainly based on imported industrial fuels.

Woolen, cotton and silk clothes, chemicals, porcelain utensils, tools and machines, textile industry machine tools are made in this state. After textile manufacturing, industries related to motor car and transport equipment manufacturing are established in this part. The world famous motor car Toyota is manufactured in Toyota Nagar located in this area.

About 10 types of industries like cotton textiles, porcelain, oil refining, stone and clay, iron-steel, printing, dyeing etc. are established in Nagoya. Heavy industry (iron and steel) has been established in Aichi Prefecture since 1960, with Okazaki being its main center. Bisai and Yokkaichi, west of Nagoya, are Japan's largest centers of woolen textiles. Southeast of Nagoya lies Toyota, a major industrial center for Japanese car manufacturing. This industry gets iron and steel from the iron and steel industry of Tokai. Shizuoka, located on Suruga Bay, is a major center of lacquer, furniture, shoe, aluminum smelting and card board factories.

(3) Kobe-Osaka Industrial Region or Hanshin Industrial Region: Located on the eastern coast of the Inland Sea of Japan, in this industrial area, 26 percent of iron and steel, 25 percent of metal, 21.8 percent of machine tools and 20 percent of textile manufacturing are produced within the limits of this industrial area. This area is called 'Manchester of Japan'. This is the oldest industrial region of Japan. Osaka has a special place in cotton textile manufacturing. Most of the cotton textiles are manufactured in all the eastern countries.

The Kyoto-Biwako region is the largest silk textile manufacturing area in Japan. An industry was established here to produce raw silk. Other cities Osaka Kobe, Himeji, Akeji are also textile manufacturing industry centers.

4. Nagasaki Maulian Industrial Zone or Southwestern Honshu Region: This industrial zone extends to Nagasaki Mauji-dabe. The last two cities (Mauji and Dabe) are located near coal mining centers, the largest facility located at the end of Honshu Island. Iron ore is imported, 5 percent of steel and 75 percent of cast iron is obtained from this region. Other

industries in this state include heavy goods, chemicals, paper and cement. The region's major industrial cities are: Nagasaki, Fukuoka, Kurume and Sago in Kyushu and Shimonoseki, Ube and Moji at the tip of Honshu Island.

(5) Other areas: Apart from these four major industrial areas, there are four smaller areas.

(i) Fukui-Ishikawa Region: Fukui-Ishikawa region: Industries of artificial silk, cotton, yarn and textile, cement, metal refining are established in the cities of Fukui and Kanazawa in Fukui and Ishikawa Prefectures of Japan in the western part of Honshu Island. Kanazawa is the world's largest (YKK) brand. Zip manufacturing factory is established

(ii) Hiroshima-Kure-Fukuyama Industrial Area: (ii) Hiroshima-Kure-Fukuyama Industrial Area: Located on the coastal part of the interior sea of Honshu island. Hiroshima has a developed industry due to cement, local lime and groundwater. It is the center of chemical industry, copper refining, wood industry and paper-related industries. The Kure-Fukuyama area is an industrial city located east of Hiroshima. Rubber, chemicals, liquor and metal goods are manufactured here.

(iii) Northern Shikoku Industrial Region: Matsuyama, Kagawa and Takamatsu are the main industrial cities in the northern part of Shikoku Island. Chemical fertilizers, cement, iron-steel and silk textile industries are established here.

(iv) Hakodate area: Due to the abundance of forests and minerals in Hokkaido Island, industries related to wood pulp paper making, fruit canning, wine making, chemical fertilizers, cement and machinery have been established in Hakodate. This area is located on the southern part of Hokkaido Island.

3. INDUSTRIAL REGIONS OF FORMER USSR

Before the social revolution of 1917, the eastern parts of the Moscow region were extremely backward from the industrial point of view, but now industries have developed in these areas, yet 80% of Russia's factories and production comes from European Russia and the Ural regions. . The objective of the Soviet organization is to redistribute the craft industries throughout the country so that there is no monopoly of industries in any particular region. Machinery manufacturing, farming there are big factories manufacturing tools, motors, tractors, motor vehicles, cotton buses, leather goods, pottery, chemicals etc. Thus the industrial organization of Soviet Russia depends only on those goods which can be produced in Russia itself.

The main industrial sectors of Russia are:

(1) Moscow or Central Industrial Region: About 720 km. It is long and 320 km wide. It extends from Shcherbakov to Dacian Bryansk in the north and from Smolensk in the west to Gorky in the east. The mainstay of industries in this region is the coal fields of Tula. There are

coal fields from which low grade coal is obtained. Oil, petroleum, and water power are often in short supply, but some iron and phosphate are available. First, industries of flax spinning and linen weaving, leather dyeing, textile making, sawing and dressing wood, and oil refining were established. After this, due to the technical knowledge and efficiency of the Russians, many types of industries developed, the major ones being electrical equipment, scientific instruments, machine tools, chemicals, acids, gases, fertilizers, artificial rubber, furniture making etc. Moscow is the biggest center here. In this, 1/4 of Russia's factories and 10% of industrial production are found. Machines for the cotton textile industry are specially made here. Ceramics and chemicals in Stanilogorsk, Cotton textiles in Jo (Ivanovo) (this city is called Manchester of Russia), synthetic rubber and tappers, farming equipment and tractors in Yaroslavl; Motors and units are manufactured in Gorky, Yaroslavl and Moscow. Gorky Kamka is called Datapat. Apart from motors, other items related to paper and wood are also made here. The chemical industry is concentrated in Moscow, Kazan, Gorky and Yaroslavl. Cotton and linen fabrics and train carriages are made in Kalinin and engines are made in Kolomna. The maximum diversity in terms of industries is found in this state.

(2) Ukraine Region: This region is spread between the cities of Odessa, Kharkov and Kov in the south-west of Russia. Economic wealth is especially found in this area. Large deposits of coking coal are found in the valley of the Donge River. The best quality iron in Krivoirog; Manganese in Nikopol, lime, salt, china clay in many parts of Ukraine; And petroleum is found at a distance of 800 kilometers in the Volga-Ural region and one of the world's largest power houses is located in Zapokozhai on the Dnieper River. The Don, Roper, Bolga Rivers and the Black Sea serve the transport needs. Due to all these reasons, industries here have developed into two sub-sectors.

(a) The part east of the river Donez: especially heavy industries are established here - cast iron, crude steel pipes, steel sheets, rods, railway tracks, railway equipment, farming machines, fertilizers and chemicals.

(b) The part west of the Honez River: Steel, cotton textiles, aluminum, explosive materials, chemical products, farming machines, engines, railway equipment and food, sugar and leather industries are established here.

fertilizers and sugar in Kiev, agricultural equipment in Odessa, Rostov and Kiev, steel in Krivoy Rog, engineering goods in Nepropetrovsk, and coal-fired electric engines and automobiles in Voroshilovgrad and Donetsk, steel factories in Donetsk, Voroshilovsk and Krasnoyarsk; And machine tools, tractors, aluminum, steel composites and engineering goods are made in Zafordze and agricultural machines, engines, railway equipment are made in Kharkov.

(3) Leningrad region: Leningrad region is the second largest region of Russia, although it does not have abundance of industrial resources but due to its proximity to the sea towards the west, there is facility to import most of the goods. Industries have developed in this area.

Airplanes and atomic powered ice breakers, turbines, typewriters, cameras, telephones, radios, motorcycles, rayon, furniture, paper, shoes, leather goods, light chemicals and cotton textiles. Leninabad is the biggest center here. 75% of Russia's ships, 35% of paper and 50% of electrical equipment are obtained from this region. Leningrad, Petrozavodsk and Bolkhant are major industrial cities.

(4) Ural Region: This region is 800 km long from north to south along the Ural Mountains., and 320 km. It is spread widely in which many industries are found decentralized. In this region, high grade iron ore, chrome, manganese, copper, asbestos, salt, phosphate, sulphur, bauxite and building materials are found in various parts of the Urals; Coal is found in distant areas and wood is found in the Ural Mountains. Therefore, most of the heavy goods industries are found concentrated in this area. This is where 35% of Russia's steel is obtained. Smelting of zinc, iron ore and aluminum is carried out in factories in different parts of the Ural region. Machines are produced in Yekoterin burg (Sverdlovsk), Chelyabinsk, Nizhny Tagil, Ufa and Perm. Chemical industry, railways and armaments manufacturing work also takes place in this area. Sverdlovsk has factories for refining copper, steel, machinery and machine tools. There are factories for refining lignite coal, making tractor and grinding flour in Cheliavsk. Nizhny Tagil has the world's largest factory for making railway carriages. Steel is also made here. Ork has factories for smelting gold, copper and making steel and engines. Chemical fertilizers and ships are made in Perm. Other main industrial centers are Samara (Kuibyshev), Takli Magnitogorsk, Slatoust and Tyumen.

(5) The Kuznetsk Basin or Kuzbas Region: This area is new and is located in the valley of the Kuzbuj River. Many factories of chemical fertilizer, butter, sugar, flour, liquor and leather are found in this area. Machinery and consumer goods in Novosibirsk, oil refining and metal manufacturing, chemicals and coal power in Kemerovo; Iron, steel and automobiles are made in Novokuznesk and airplanes are made in Omsk. Cotton textiles, ready-made garments, food items and leather goods are manufactured in Barnaul. Tomsk and Kemerovo are other industrial centers where machines are made are. Tomsk, Biysk and Semipalatinsk are other industrial centers.

(6) Far East Siberian Region: Efforts have been made to make this region economically self-reliant. The Transsiberian Railway passes through this area. In Krasnoyarsk, Ikhintsk, Ulan-Ude, Chita, Khabarovsk and Vladivostok located along its banks, industries such as lumbering, metal refining, making agricultural machines, cotton textiles and oil refining have flourished. Chemicals, paper and paper pulp are also manufactured here. Most of the ships are built in Vladivostok and Kosomolsk.

(7) Regions of Central Asia: In this region, in the foothills of Dhyan-Shan Mountains, industries have developed due to the facility of hydroelectric power and unlimited sources of gas and coal and agricultural products near Bukhara. Is. Cotton clothes, chemicals, sugar etc. are

made. Tashkent is the industrial capital of Central Asian Russia. Steel, machines, cotton clothes, chemical fertilizers are made here. Cotton and silk clothes are made in Samarkand and Bukhara. Dushanbe has many factories for food products, leather dyeing, printing and cotton textiles. There are meat processing, tobacco and soap manufacturing industries in Biskek.

(8) Caspian Sea Region: In this, industries related to agricultural producers especially developed more. The major industries are meat packing, fruit preservation and packaging, oil extraction, tobacco preparation, cotton fabric etc. Due to oil being found in the region, there are oil refineries in Baku, Tbilisi (Makhachkala) and Grozny. Major industries are iron and steel in Rostov, artificial dyeing, leather tanning and cigarette making in Yerevan.

4. INDUSTRIAL REGIONS OF CANADA

The industrial belt in Canada extends from Windsor in the west to Quebec in the east via Toronto, Montreal, that is, the main industrial area here is the St. Lawrence Valley and the adjacent part of Lake Ontario. The industrial structure here is of complex type. Here, manufacturing industries are affected only on the basis of local raw materials. Based on the complex structure and diversity of industries in Canada, the following industrial sectors can be classified:

(1) Southern Ontario St. Lawrence Lowland Region: This is the major industrial region of Canada. More than 75% of Canada's industrial production comes from this region. Transportation in the region is provided by the St. Lawrence River. Apart from this, means of transport are available. Here raw material is easily collected. Coal is imported from the Appalachian region and iron ore from the Lake Superior region.

The development of manufacturing industries here has been based on the raw materials available here since ancient times. In ancient times, hairy leather was prepared here. Various types of pulp and paper mills are found here. The metals industry extended around the western end of Lake Ontario from Ottawa to Toronto to Niagara Falls. The area from southern Ontario to Windsor is also important. There are factories for making iron-steel, vehicles, agricultural equipment etc. The iron and steel industry is concentrated in Hamilton. Chemical industries are prominent in Quebec, Sarnia and Ontario. Montreal has oil refineries and petrochemical factories. Marshall Oil Refinery receives crude oil from Western Canada and foreign countries. Other major industries are textile industry, apparel, rubber goods, furniture, printing, footwear etc.

(2) Maritime Province Region: This is a small industrial region. Manufacturing industries are found in less quantity here. Here too most of the industry is based on local raw materials. Cutting and sawing wood is an ancient industry here. Most of the people are engaged in primary industries like fishing, agriculture and mining etc. Pulp and paper industry is developed in Edmonton and Saint John. There are factories producing meat, dairy products and miscellaneous

goods in Novascosia and Brunswick. There is an iron and steel manufacturing industry in Novascosia. Many engineering industries have also been established here. The main centers of shipping industry are Saint John and Halifax.

(3) Prairie Region: This industrial region has abundance of industries based on agriculture. Industries based on flour grinding, meat canning and dairy products are developed here. Agricultural equipment, fertilizer machine manufacturing industry etc. have also developed. Edmonton, Calgary, Regina and Winnipeg etc. are related to the petroleum refining industry. Petrochemical industries, rayon, plastic and fertilizer industries based on petroleum refining have also been established.

(4) Pacific Coastal Region: The main center of this region is Vancouver. The major industries in this state are pulp, paper, wood crushing, fish cleaning and canning and industries for preserving fruits and vegetables. Aluminum industry has also been established here.

5. INDUSTRIAL REGIONS OF UNITED KINGDOM

Small industrial areas are developed in the United Kingdom, which are mostly concentrated in the coastal areas. Industries have also developed in the interior parts of the country. Most of the industrial areas here are in the coal-yielding areas. The United Kingdom has the following industrial areas. Can be divided into:

- (1) London Metropolitan Region,
- (2) Central Region,
- (3) North-Eastern Region,
- (4) South Wales Region, and
- (5) Scotland Valley Region

(1) London Metropolitan Region: The London metropolitan area is not only the center of London trade and commerce, but also an important industrial region of the United Kingdom (Great Britain). It is situated 40 kilometers away from the mouth of the River Thames. Eight new cities have developed around it which is important from industrial point of view. Two types of industries have developed in the London area. Chemical, oil refining, leather tanning, heavy engineering industries, soap making and shipbuilding industries are concentrated along the banks of the River Thames. Industries related to food items, clothing, motor vehicles, cameras, furniture, lead goods and printing are concentrated in the northern area of London. After the Second World War, this industrial region had to be decentralized; hence a new center was created have developed. The centers are Basildon, Becknell, Crawley, Harlow Hartfield, Hemel, Hempstead, Stevero and Welvon Gardens. Engineering and steel industries have not been developed in London.

(2) Central Region: This is the second important industrial area. This includes centers like Preston, Leeds, Leicester, Birmingham and Liverpool. There are important coal mines of Nottingham and Rest in this state from where coal is available in sufficient quantity. Britain's important iron and steel industry is concentrated here. Therefore, machines, motor vehicles, railway goods, railway engines, bicycles and other heavy industries have been established here. Birmingham is a major center of the iron and steel industry.

Apart from this, there are factories for making machines, metal other goods and structural steel. Along with these industries, motor vehicles, tires, rayon, clothes from artificial fibres, electrical appliances, machine tools, food and beverages etc. are also manufactured here.

There are woolen textile factories in Leeds and Bedford in the north-east of this region. Steel goods are made in Sheffield. There are factories manufacturing woolen garments, hosiery, bicycles, motor vehicles and shoes in Nottingham and Leicester.

Within this region, the cotton textile sector of Lancashire, apart from the Birmingham area, is important. Lancashire is divided into two small regions. Spinning is the main occupation in the foothills of the Pennines. Oldham, Rockdale, Boston, Bury and Stalbridge are famous for their cotton factories. Northside Preston, Blackpool, industrial regions of the United Kingdom. There are textiles weaving factories in Nelson etc.

(3) North-Eastern State: It extends to the area adjacent to Newcastle. The city is 16 kilometers away from the River Tyne. Here iron ore is obtained from the hills of Cleveland and coal from the Durham region. There are safe harbors here. Therefore, apart from steel, railway goods, refreshments and other light industries are found here. Other industrial cities in the region are Middlesbrough, Stockton and Hartlepool. The metallurgical industry is concentrated here

(4) South Wales region: South Wales has become an important industrial region as a result of local coal availability and long-term metallurgical industrial experience. The best type of anthracite coal is available here. Local iron ore is also available here, so iron and steel factories developed in Merthyr, Tyfil, Doblal, Abbeywell etc. Cardiff, Newport and Swansea exported iron, coal and steel to the coast, but for some time they had to import local iron ore. Apart from iron and steel industries, non-ferrous metal industries were also selected here. Chemical industries and petroleum refineries have been established in Swansea.

(5) Scotland Valley Region: Scotland is centered on the region's industries and lowlands. This industrial area extends from Edinburgh in the west to the mouth of the River Clyde. Glasgow and Edinburgh are important industrial centers in the region. Iron seams are also found in the Glasgow coal fields. Other essential iron, cotton and petroleum etc. are imported from North America. Due to these facilities, various industries have developed here. Iron and steel industry is the main industry of this region. Iron and steel industries developed in Glasgow, Audi, Coatbridge, Madele Vale, Wishaw, Paisley and Georgetown. Thus the area is a metallurgical region. Due to the availability of metal, engineering industry has developed here in

which pipes, motor-cars, pumps, machinery and kinetic vehicles are manufactured. The cotton textile industry is also concentrated in Glasgow. Printing and light industries are concentrated in Edinburgh. Dundee is famous for textile industry.

6. INDUSTRIAL REGIONS OF FRANCE

There has been considerable development of industries in France. The main industries here are iron-steel, engineering, cotton, woolen and silk textiles, cement, chemicals etc. The chemical industry has been more important here. At present the iron and steel industry has developed rapidly. France can be divided into the following industrial regions.

- (1) Northern France Region,
- (2) Paris Region,
- (3) Sar-Lorraine-Luxemburg Region,
- (4) Alsace Region,
- (5) Middle France Region, and
- (6) Pyrenees Region.

1. Northern France Region: The industrial region extends in Northern France, which is connected to the Flanders region of Belgium. There are two main industrial areas in this region (1) Shield Valley region, (2) Flanders region.

There is a concentration of heavy industries in the Scheldt Valley area. Coal is local here. Iron ore is imported from the Lorraine region and other countries. There are more iron and steel factories in this area. Due to abundance of steel, many factories manufacturing steel goods have developed here. Valenciennes is the main center of this French culture and has a concentration of light industries in Flanders. Mainly textile industry is developed here. Among the clothes, cotton clothes and linen are prominent. Flax is available in sufficient quantity here, hence linen industry has developed. Lille is a major center of cotton textile industry. The centers of the woolen textile industry are Roubaix and Torcoing. Along with the textile industry, the metallic engineering industry has also developed. Apart from these industries, there are factories making hosiery, garments, curtain fabrics and carpets.

(2) Paris Region: Paris metropolis is a big market and a large industrial area. It is connected to every part of France by rivers, roads and railways. Adequate amount of capital is available here. Due to being a highly populated area, workers are available and there are good markets also. Motor vehicles, aircraft, electrical machines, metal goods, engines, railway goods, printing, food and clothing industries are concentrated here. Apart from these, there are also industries of petroleum refining, fertilizer, cement, rubber goods etc. The traditional industries here are

jewellery, perfumery, furniture and leather goods making etc. The tourism industry has also developed in Paris.

(3) Sar-Lorraine-Luxembourg Region: It extends on the borders of France, Germany and Luxembourg. Here, the Lorraine iron ore region of eastern France and the coal region of Saar have been special contributors to industrial development. Industries like iron-steel, machinery, chemical, fertilizer, cement, glass etc. are concentrated in this state. This entire state is famous for heavy metal and chemical industries. Major industrial centers are Logway, Bre, Metz, Nancy, Saraville, Sarbouken, Lunéville etc. Lunéville is the center of the glass industry. Apart from heavy industries, textile, furniture, electrical machines and leather industries are developed in Nancy. Bakligen, Nankirken and Dillingen etc. are centers of metal industries. There are factories for making porcelain utensils and tiles in Mergiz and Metlak.

(4) Alsace Region: This region is the old industrial center of France's textile industry. Here initially the textile industry developed as a domestic industry. The textile industry first developed in the Voj mountainous region. After this it became concentrated in the Rhine valley. Mulhouse is the main center of textile industry. Apart from the textile industry, there are factories for making woolen, silk and synthetic threads. Apart from the textile industry, there are also factories producing woolen, silk and synthetic threads. Apart from these, machine, equipment and machinery industries are also found here. There are also factories for making railway engines, diesel engines, turbines, electrical machines and typewriters etc. Due to the presence of potash reserves near Mulhouse, the fertilizer industry has also developed significantly here.

(5) Middle France Region: Many industrial areas are scattered in this region. Most of the industries here have developed only where raw materials and means of transport are available. On the northern margin of the central plateau, metallurgical industry has developed in Lacrisote, Most Lucon and Saint-Etienne. There are factories here to make various items from iron and steel. Apart from the textile industry, chemical and metallurgical industries have developed around Lyon towards the east of the plateau. There are factories manufacturing various engineering goods here. Metallurgical industries developed in the city of Grenoble and the surrounding areas of the French Alps. In this Aluminum industry is more important. Apart from this, the cement industry is also in a developed state here.

(6) Pyranese Region: This industrial region extends to the border of Southern France. But it is near the Pyrenees mountain range. There has been substantial development of hydropower here. Therefore, chemical and metallurgical industries have developed more here. Among the chemical industries, the manufacturing industry of phosphate and nitrate is prominent. The main centers of aluminum industry are Aujat and Sabarat in the Vicdessos river valley and Bered etc. in the Auray valley. An important concentration of the construction industry is found within the triangular area formed by the cities of Tarbes, Ladens and Bagnères-de-Bigorre. Aircraft and engineering industries are also developed in this area.

7. INDUSTRIAL REGIONS OF GERMANY

Germany is a major industrial region of Europe. Its location in the middle of highly populated areas, availability of high grade coal in sufficient quantities, early development of the woolen textile industry due to availability of iron and wool, railway facilities and proximity to the sea coast, ease of access to no rivers for transportation. And due to strong will power, diligence and technically skilled people, this area has been helped in industrial development. Therefore, industries like iron, steel, cotton, woolen textiles, artificial silk, chemicals, medicines, machinery, ships, aero planes, etc. have developed especially in this state.

Germany has four major industrial sectors:

1. Ruhr Region: It is the largest industrial area in Germany, approximately 120 km long and 65 km wide. There are immense quantities of coal deposits in this area of Westfalia. Minerals like iron ore, limestone, glass sand, potash etc. are also available in sufficient quantity. A vast system of rivers and canals is found. A network of railways and roads has been laid. In the northern regions, raw materials are available in the form of agricultural products and in the southern regions in the form of forests. There is facility for import of cotton and raw silk. Hence, the concentration of iron-steel and heavy engineering industries is high in this state. Heavy industry is particularly concentrated in Muilheim, Rhine, Hausen and Haspe. Engineering factories are in Bochum, Essen, Dortmund, Dullsdorf, Duisburg and Glasenkircher. Railway engines, trains, motors, cranes, weapons etc. are made in these cities. Chemicals are manufactured in Duisburg, Dullsdorf, Horn, Bochum, Cologne and Essen.

2. Saar Basin Area: Saar Basin Area is located in the basin of the Saar River in the south-western part of Germany. Coal is found in large quantities here. Iron ore is imported from France. Iron-steel industry and engineering industry are more developed in this region. Iron sheets and wires, rods, girders, glass, porcelain and leather items are made. Saar Bukan is the main centre.

3. Bavaria Area: This is a high region where there are facilities for developing hydroelectric power but coal and other minerals are not found in this area, hence such industries have been developed here which are light but valuable. . Watches, toys, scientific instruments, vests, socks, chemicals, musical instruments, liquor, medicines, machine tools, etc. are made in this area. Munich StaatsgaiNeureinvern Frankfurt is a major industrial city. Scientific instruments, woolen clothes and wine are made in Munich. Factories for making engineering goods, micro instruments, photography equipment, radio, chemicals, motor cars etc. are located in Studyard. Bicycles, toys, scientific instruments and light machines are made in Nuremberg. Glass, porcelain, machine tools, heavy machines, aircraft, microscopic scientific instruments, chemical and paper industries are developed in Mannahim.

(iv) Saxony region: Coal, glass sand, potash, limestone etc. are found in Saxony region. Hydropower has developed significantly. The industry of making ceramic items is very popular

here. Apart from this, there are many factories manufacturing clothes, iron, steel, machinery, chemicals etc. There are more cotton textile factories in the cities of Lipetsk and Romaniz. Aline Nagar is notable for socks and vests. Iron, steel and machines are made in the city of Dresden, Kalche and in Leipzig. Ceramic utensils are made in Piesen and printing machines are made in Leipzig. Other industrial centers are Butterfield, Freiberg, Bothen, Erfurt and Bernvarn.

8. INDUSTRIAL REGIONS OF CHINA

Industrial development in China occurred after 1949. There are abundant natural resources here on which industries have been developed. Here industrial development was done according to government policies. In this, more emphasis was given to basic industries. China's main industrial region is in the lower valley of the Yangtze River. The northern plains of Henan and southern Manchuria are also industrial areas. Apart from these, there are other small industrial areas. Following are the major industrial regions of China:

- (1) North-eastern China region,
- (2) Beijing Taiyuan-sigtao area,
- (3) Shanghai-Wuhan area, and
- (4) Kwangchou (Canton) area.

1. North-Eastern China: This industrial area is spread in Heilongkiang, Kirin and Liaoning provinces in the north-eastern part of China. Industrial development here was done by the Japanese before the Second World War. He established the Showa Iron and Steel Works in Anshan, Liaoning Province. Industrial development in this area took place after the Second World War. The major industries of this region are machine industry, motor cars, ships, engines, chemicals, sawdust, paper, cement, heavy machinery etc. Iron, bauxite, antimony, lime, gypsum and copper etc. of this region have an important contribution in the industrial development of this region. Coal and petroleum are also found here. Cotton and soybean are found in large quantities here. Anshang is an important industrial city. Here, in addition to raw iron and steel, steel sheets, tubes and other things are made in the iron-steel plant Mining machines, metal refining machines, metal industry equipment, trucks and motors are made in Liaoning province. Shipbuilding work is in progress in Telian. Electric motors and electrical accessories are made in Shenyang and Harbin. Kirin is an important industrial area where factories manufacturing chemical fertilizers, artificial fibres, plastics, rubber and dyes etc. are concentrated. Paper making factories are concentrated in Kiamuje. The major industrial centers of this region are Anshan, Telian, Harbin, Shenyang, Luta, Penqi and Kiamuze etc.

2. Beijing Taiyuan-Sigtao area: This industrial area extends to Shandong, Guangdong, Shanxi, Shensi and Hunan provinces. Minerals like iron, tungsten and gypsum etc. are found here. There are huge reserves of coal here. The region is an important agricultural area of China. Tobacco,

cotton and soybean are produced more here; hence industries based on these have developed. Industries like iron-steel, cotton textiles, artificial textiles, cement, agricultural machinery, construction engineering, chemicals etc. are concentrated in this area. Its main centers are Taiyuan, Beijing, Tientsin, Sinan, Tsingtao and Chengchow etc.

3. Shanghai-Wuhan region: It extends to the eastern coastal part of China and the delta and party of Yangtze River. Shanghai is an important industrial center located at the mouth of the Yangtze River. Shanghai is very prosperous for the cotton textile industry. Due to abundance of cotton cloth it is called Manchester of China. The main industries of this region are cotton textiles, iron-steel, machine manufacturing, engineering, cement, chemicals, ship manufacturing, plastics, agricultural implements etc. Iron-steel industry was established in Wuhan in 1907. Changsha and Nanchang are important industrial centers west of Wuhan. Paper, clothes, machines, chemicals and agricultural tools etc. are made here. Chungking is the main center in the upper valley. Silk textile, fertilizer and plastic industries are concentrated here. The major industrial centers in this region are Shanghai, Wuhan, Nanchang, Hangzhou and Nanking etc. Other new industries in this area there are watches, cameras etc.

4. Kwangchow (Keshtan) area: This industrial area extends at the mouth of the Sikyang River. There are factories manufacturing silk and cotton textiles, jute, ships, paper, sugar, machinery, cement and porcelain. Motor vehicles and aircraft are also manufactured here.

Apart from the above mentioned major industrial areas, scattered industrial centers are found here.

9. INDUSTRIAL REGIONS OF INDIA

Industries have an important contribution in the Indian economy. Industries in India started from 1854. Industries got encouragement with the introduction of five year plans.

The first attempt to divide India into industrial regions was made by Twartha and Werber in 1951. They created (1) Northern, (2) Western, and (3) Southern industrial regions. In 1959, Curran and Jenkins divided India into three types of industrial regions on the basis of average number of workers (1) Principal Industrial regions, (2) Secondary industrial regions, and (3) Industrial centers.

Karan again in 1964 divided it into 5 major industrial regions, 14 secondary industrial regions, and 17 industrial centers on the basis of the number of industrial workers.

In 1971 R. I. Singh divided India into industrial regions. He used the number of factories as the basis for demarcation of industrial areas. He has mentioned the following 11 industrial regions of India (1) Calcutta (Kolkata) Hooghly Industrial Region, (2) Southern Bihar-Northern Orissa Industrial Region (3) Ahmadabad-Baroda (Baroda) Industrial Region (4) Bombay (Mumbai) Poona (Pune) Industrial Region (5) Bangalore Madras (Chennai) Industrial Region,

(6) Coimbatore-Madurai Industrial Region, (7) Kerala Industrial Region (8) Luck now-Kanpur Industrial Region, (9) Delhi-Ghaziabad-Amritsar Industrial Region, (10) Digboi Industrial Region, (11) Eastern Uttar Pradesh and North Bihar Industrial Region.

Generally India can be divided into the following industrial regions:

1. Major Industrial Regions

(A) West Bengal-Bihar Industrial Region,

(B) Mumbai-Pune Industrial Region,

(C) Ahmedabad-Varodara Industrial Region,

(D) Madurai-Coimbatore-Bangalore Industrial Region (Madurai-Coimbatore-Bangalore Industrial region.

2. Minor Industrial Regions:

(A) Assam Valley, (B) Darjeeling Tarai, (C) Bihar-Uttar Pradesh, (D) Dehli-Meerut, (E) Indore - Ujjain (Indore-Ujjain), (F) Nagpur-Wardha, (G) Dharwad-Belgaum (Dharwar-Belgaon), and (H) Godavari-Krishna Delta.

3. Industrial Districts:

(A) Agra, (B) Aligarh, (C) Amritsar, (D) Gwalior, (E) Bhopal, (F) Hyderabad, (G) Jammu, (H) Jabalpur, (I) Kanpur, (J) Chennai, (K) Cochin, (L) Jaipur, (M) Luck now, and (N) Sholapur.

1. Major Industrial Regions

A. West Bengal-Jharkhand Industrial Region: This industrial region is divided into two subdivisions:

1. Chhota Nagpur Industrial Region, and

2. Hooghly Industrial Region.

Chota Nagpur Industrial Region: This industrial region is spread in Jharkhand, Northern Orissa and West Bengal. This is a large area of Damodar Valley. Heavy metal industries have developed in this state. For this industrial area, coal from Raniganj and Jharia, iron ore from Mayurbhanj, BadamPahar and Gurumahisani; manganese from Bonai and Barakar; Limestone from Veeramitrapur, Katni, Visra and adequate amount of water is available from Damodar and Barakar Rivers. Iron and steel factories are located here in Jamshedpur, Durgapur, Burnpur, Rourkela and Bokaro etc. Apart from iron and steel, industries like heavy machinery, railway engines, coaches, motor vehicles, agricultural equipment, engineering industries, aluminium, paper, ceramics, cement, explosive materials etc. are concentrated here. Jamshedpur is the

central city of this state where TISCO is located. Apart from Jamshedpur, Rourkela, Durgapur, Asansol, Chittaranjan, Hirapur, J. Of. Nagar, Raniganj, Bokaro, Sindri, Hazaribagh, Ranchi, Dalmia Nagar are other industrial cities. Railway engines are made in Chittaranjan. The industrial region here has the facility of Kolkata Port which provides the facility of bringing and transporting raw materials and finished goods.

Hooghly Industrial Region: Important industrial region on the banks of Hooghly River in Greater Calcutta (its extension is about 100 kilometers in length. Various goods are manufactured in this industrial region. Jute industry is prominent in it. 90% of the country's jute goods are produced here. Apart from these, industries like paper, cotton, locomotive, motor vehicle, shipbuilding, chemical, pharmaceutical, plastic, cement, fertilizer, etc. are concentrated. The main center of the industry is Titagarh. Apart from this, Raniganj, Kakinada, Chandrahati are concentrated. The paper industry is concentrated. Apart from this, paper industries are concentrated in Raniganj, Kakinada, Chandrahati and Naihati etc. There is an imported mineral oil refinery in Haldia. Petrochemical industry is also being developed here. The major industrial centers of this state are Haldia, Shrirampur, Risra, Howrah, Kolkata, Naihati, Kakinada, Titagarh, Bajbaj, Agarpara, Birlapur, Bansberia, Belghadiya and Hooghly etc.

This industrial region has the following facilities - Kolkata is a port and a railway junction, hence it provides transportation facilities. Adequate water and water transportation facilities are available through Hooghly River. All raw materials are available around Kolkata. There are facilities for workers here. Due to density of population the demand for finished goods remains high.

Mumbai-Pune Industrial Region: This industrial region extends from Thane in the north via Mumbai to Pune. The main industry of this industrial region is cotton textiles. All facilities are available for the cotton textile industry here. Cotton is grown in sufficient quantity around it. And it is imported from abroad as per requirement. Mumbai is the best natural port of India, hence machines are easily imported. Petroleum is available here and electricity is available from Tata Hydroelectric Power Station. Laborers are also available in sufficient quantity here. With the construction of Suez Canal, there has been direct connection with western countries.

Apart from cotton textile industry, engineering industry is the second important industry here. The major engineering industries are motor vehicles and shipbuilding. The world's textile industries, agricultural equipment, electrical goods and other engineering industries have developed. Industries like chemicals, petro-chemicals, vegetable ghee, rubber, plastic, glass, cement, fertilizers, medicines, sugar etc. are concentrated here. There is a petroleum refinery in Trombay, a penicillin factory in Chamri and an arms factory in Ambarnath. The film industry has developed here. There has been substantial development of nuclear power. The major industrial centers of this state are Mumbai, Colaba, Kalyan, Thane, Trambhe, Pune, Pimpri, Sholapur, Ahmednagar and Satara etc.

Ahmedabad-Varodara Industrial Region: This industrial region extends from Ahmedabad to Vadodara. The main centers of this industrial region are Ahmedabad, Vadodara, Koyli, Surat, Bharuch, Anand, Surendra Nagar, Rajkot etc. The main industry of this state is cotton textiles. Cotton is produced in abundance here and the cotton region of North India is also close to it. The climate here is good for the cotton textile industry. Coal is available here from Madhya Pradesh. Laborers are also available in sufficient quantity here, which are available more and cheaper than in Mumbai. There is facility for international trade. Due to these reasons, industries have gathered here. Ahmedabad, Vadodara, Surat, Bharuch, Surendranagar, Bhavnagar and Rajkot are famous for cotton textile industry. Along with the cotton textile industry, woolen, silk and artificial thread making industries have developed here. Surat is famous for silk industry. There is a practice of making fake silk, chemicals, sugar, beedi, vegetable oil, engineering industry, gold and silver wire, zari embroidery and artistic items here. There is a petroleum refinery and a petrochemical factory in Koyali. This is the largest center of petrochemicals. Cotton textile, chemical, pharmaceutical, glass and light and heavy chemical industries are concentrated in Vadodara. Apart from these, chemical industries, medicines, varnish, glass, engineering, motor, tractor and bicycle industries have developed in this state. Anand Dairy is the center of milk products.

Madurai-Coimbatore-Bangalore Industrial Region: This industrial region extends up to Bangalore, Coimbatore and Madurai. Textile industry dominates here. The textile industry is more developed in Coimbatore. Cotton, silk and rayon industries have developed here on a large scale. Coimbatore is called Manchester of Tamil Nadu. Apart from the cotton textile industry, iron, industrial equipment, rubber, cement, coffee, chemical, cigarette and leather industries are concentrated here. Other centers of cotton textile industry are Madurai, Salem, Perambur, Tiruchirapalli, Ramanathapuram, Tuticorin, Thanjavur, Tirunelveli and Gudiyattam etc. Industries like cotton textiles, motor vehicles, ships, railway coaches, leather, cement, chemicals, machinery equipment, bicycles and cigarettes etc. are concentrated in Bangalore. Bangalore is especially famous for aircraft (HAL), watches (HMT), and telephones (HTL).

There are factories manufacturing silk, cotton and cotton textiles, engineering, sugar and food items in Madurai.

Minor Industrial Regions

(A) Assam Valley: It has factories for preparing tea, rice, flour etc. Additionally, jute, There are also industries related to paper, wood, silk and petroleum etc. Petroleum refinery in Noonmati.

(B) Darjeeling Terai: Tea and pineapple plantations are found here. Tea is prepared in this area. The main industrial center here is Jalpaiguri. Food related and forest industries are developed here.

(C) Bihar-Uttar Pradesh: It includes Northern Bihar and Eastern Uttar Pradesh. It has sugar, rice, wheat and other butter factories in Uttar Pradesh. Paper, cement plant, waste oil are

concentrated in Dalmia Nagar, chemicals and textiles in Patna, sugar, liquor, jute and food items related industries are concentrated in Gorakhpur.

(D) **Delhi-Meerut:** Delhi-Meerut is a small industrial area near Delhi on the western border of Uttar Pradesh.

(E) **Indore-Ujjain:** Cotton textile industry has been centralized in this state. Food and Chemical items. Industries are found. Apart from the cotton textile industry, the industries here include woolen; there are fiber textile, vegetable ghee, and electrical goods, chemical and pharmaceutical industries.

(F) **Nagpur-Wardha:** Its main centers are Nagpur and Wardha. There are industries related to cotton textiles, engineering, chemicals, and glass and food items.

(G) **Dharwad Belgaum:** It is spread over Dharwad and the material is Chemical. From Belgaum. And light engineering industries are developed. , Here clean cotton clothes and rice. Fish related work also on a large scale.

(H) **Godavari-Krishna Delta:** The main centers of this industrial region are Vijayawada, Visakhapatnam Rajamahendri, (Rajahmundry) Guntur and Machilipatnam etc. Here in the agriculture-oriented area, rice, textile, sugar and fishery industries, cement, fertilizer, chemical, light engineering, steel and shipbuilding industries are developed. There is a shipbuilding factory in Visakhapatnam. There is a lead zinc smelting plant in Guntur. There is an iron-steel factory in Vijayanagar.

INDUSTRIAL DISTRICTS

(A) Agra Shoe, leather, carpets, rugs, vegetable ghee, light engineering, rickshaw, bicycle, stone Goods etc.

(B) Aligarh Leather, locks, cotton coarse textiles (khes), cutlery, dairy, vegetable oil, light engineering Industry.

(C) Amritsar, It has factories for making woolen clothes, carpets, light and heavy engineering industries, electric motors, heavy machine tools, chemical fertilizers, medicines etc. (HMT), sewing machines, bicycles, agricultural equipment.

(D) Gwalior Cotton textiles, engineering, leather, agricultural equipment, hosiery, chemicals, porcelain utensils etc. are made here.

(E) Bhopal-Heavy electrical equipment, cotton textiles, hosiery, engineering, chemicals, pulp and cardboard, sugar and food Industry.

(F) Hyderabad: Cotton textiles, vegetable oil, chemical fertilizers, heavy electrical machinery, television, watches, food items etc. are the major industries here.

(G) Jammu: Food products, woolen clothes, dyeing and printing of cotton clothes and pottery industries are prominent here. (H) Jabalpur-Cotton textiles, cement, limestone, chemicals, glass, engineering, armaments and food items are manufactured here.

(I) Kanpur is a major industrial city. The cotton and woolen textile industry is in a developed state here. Due to the centralization of the cotton textile industry, it is called the Manchester of North India. Apart from this, industries of shoes, leather, heavy chemicals, chemical fertilizers, agricultural machinery, vegetable ghee, glass, hosiery, iron goods, wires, aircraft, engineering etc. are concentrated here.

(J) Chennai - The main industry here is cotton textiles. Special types of fine clothes are prepared here. There are factories manufacturing sugar, vegetable, glass, tobacco, matches, plastics, films, cigarettes, bicycles, leather, boilers, electrical goods, metal tubes, machine tools, motor parts etc.'

(K) Cochin: Cement, ships, coffee, coconut related industries, rubber, betel nut, cashew etc. are manufactured here.

(L) Jaipur: There are industries related to embroidery, pottery, brass utensils, cotton clothes, dyeing and printing of clothes etc.

(M) Luck now Cotton textile, paper, sugar, engineering, agricultural equipment, medicines and chemical industries is famous for.

(N) Sholapur Sholapur is famous for textiles. The bed sheets and engineering goods here are famous. Silk and artificial

7.5 SUMMARY

Agriculture is an important sector that provides food, fiber and other products essential for human survival. It includes a wide range of activities related to crop cultivation, livestock rearing, forestry, fishing and aquaculture. The field of agriculture is vast and its importance cannot be underestimated.

Industrial regions are areas where industries have concentrated due to favorable geo-economic conditions. These are areas where the manufacturing industry operates on a large scale and employs a large proportion of the population. The spatial distribution of manufacturing units demonstrates a clear trend of localization towards a few select areas; these areas are referred to as 'industrial regions.' Western and central Europe, Eastern Europe, eastern Asia, and eastern North America are the world's major industrial regions. Major industrial hubs typically lie close to seaports, especially those near coalfields. Furthermore, there are some methods that can assist entrepreneurs in determining their location requirements.

7.6 GLOSSARY

Agro climatic region- An area of land that is suited to a specified range of crops, defined in terms of its temperature and rainfall regimes and, especially, its **growing period**.

Agro-ecosystem- An **ecosystem** based on agriculture. A farm, or component of a farm, treated as an ecosystem.

Agro forestry- A collective name for land-use systems in which woody perennials (trees, shrubs, etc.) are grown in association with herbaceous plants (crops, pastures) and /or livestock, in a spatial arrangement, a rotation or both, and in which there are both ecological and economic interactions between the tree and non-tree components of the system.

Air photographs- Photographs of the land surface taken from aircraft, usually at a vertical angle, normally at scales of from 1:50000 to 1:5000. For interpretation, air photographs are viewed stereoscopically to give a three-dimensional impression. Landforms, vegetation, land use and some infrastructure (especially roads and tracks) can be directly seen on air photographs, while soil properties, geology and other land properties require indirect interpretation and administrative boundaries cannot be seen. Air photographs can also be used as base maps for presentation of a land-use plan. Air photographs may be panchromatic (black and white), color (true color) or false color (see **false colour imagery**). Also called aerial photographs.

Aquaculture- Management of any plant or animal that lives in water, e.g. fish farming, shrimp farming.

Benefit-cost ratio- The **present value** of the benefits from an enterprise (farm, forest, etc.) divided by the present value of its costs.

Cadastral survey- The inventory and register of landownership on maps.

Conservation requirements The conditions of land necessary or desirable to achieve conservation of natural resources under a given **land-use type**.

Critical path method- A way of planning the operations needed to complete a land-use planning project by identifying the individual operations needed and plotting how each task has to be related to the others in time.

Crop requirements- The conditions of land necessary or desirable for the successful growth of a crop.

Decision-maker- An executive person or group responsible for land-use policy, action and allocation of resources.

Digitized map- Mapped information stored in numerical form as a series of coordinates (north, east) and their values or properties (e.g. altitude, soil series, land use).

Discounted cash flow analysis- A method of **financial analysis** and **economic analysis** in which future benefits and future costs are reduced to a lower value, which is judged to be their **present value**, by **discounting**.

Shifting Cultivation- Shifting cultivation is a mode of farming long followed in the humid tropics of Sub-Saharan Africa, Southeast Asia, and South America. In the practice of “slash and burn”, farmers would cut the native vegetation and burn it, then plant crops in the exposed, ash-fertilized soil for two or three seasons in succession.

Nomadic Herding- Nomadic herding is the farming method that involves herders and farmers traveling from place to place with their flocks of animals. And, the herders also obtain wool, meat, hide, and dairy products from the livestock.

Livestock Ranching- Ranching is the practice of raising herds of animals on large tracts of land. Ranchers commonly raise grazing animals such as cattle and sheep. Some ranchers also raise elk, bison, ostriches, emus, and alpacas. The ranching and livestock industry is growing faster than any other agricultural sector in the world.

Rudimentary Tillage- Rudimentary Sedentary Tillage: The practice of using the same land repeatedly for an extended period. Nomadic Herding: This is featured by grazing of cattle on the pastoral land. Intensive Subsistence Farming: This type of agricultural practice takes place in overpopulated countries.

SMEs -Small and Medium Enterprises.

Scrap- Iron scraps are discarded iron pieces derived from dismantled structures of factories, plants, machineries; old vehicles, etc. are recycled and widely used in this industry.

Refractories- Refractory’s are used for lining furnaces for smelting iron ore.

7.7 ANSWER TO CHECK YOUR PROGRESS

1. Where is Ruhr Industrial Region?

- A. France
- B. Germany
- C. Russia
- D. Italy

Answer: B

2. Tell the wrong pair related to Industrial Regions and their country.

- A. Saxony Region- Germany
- B. Sar- Lorraine Region - France
- C. Nagoya Region- China
- D. Glasgo Region- Great Britain

Answer: C

3. Where is Wuhan Industrial Region?

- A. China
- B. Italy
- C. France
- D. Japan

Answer: A

4. Which of the following is not Mediterranean agricultural region?

- A. Morocco
- B. Chile
- C. California
- D. India

Answer: D

5. Randhawa divides India into how many agricultural regions?

- A. 2
- B. 3
- C. 4
- D. 5

Answer: D

6. An important crop of commercial grain cultivation is:

- A. Wheat
- B. Sugarcane
- C. Cotton
- D. None of the above

Answer: A

7. Shifting agriculture is also known as Jhum in.....

- A. Maharashtra
- B. Assam
- C. Rajasthan
- D. None of the above

Answer: B

8. Which of the following does not provide agricultural credit directly?

- A. Primary agricultural Co-operative society.
- B. State Co-operative bank.
- C. Reserve bank of India.
- D. More than one of the above.

Answer: C

9. National bank for agriculture and rural development (NABARD) was established on

- A. 12 July 1986
- B. 12 July 1982
- C. 12 July 1978
- D. None of the above

Answer: B

10. Which of the following are Rabi crops only?

- A. Maize and Peas

- B. Barley and Gram
- C. Paddy and Cotton
- D. Wheat and Jowar

Answer: B

11. "Operation Flood" is a

- A. Mission to increase performance of the dairy sector.
- B. River management mission.
- C. Mission to save rain water for irrigation.
- D. Mission to increase underground water.

Answer: A

12. The largest automobile manufacturing unit in the world is located in?

- A. Detroit, USA.
- B. Ulsan, South Korea.
- C. Oguchi, Japan.
- D. Stuttgart, Germany.

Answer: B

13. Which of the following Industrial center is not located in Canada?

- A. Hamilton
- B. Windsor
- C. Sarnia
- D. Havana

Answer: D

14. Pittsburg is an important..... city in the United States of America.

- A. Copper
- B. Textile

C. Steel

D. Automobile

Answer: C

15. Osaka is an important..... City in Japan?

A. Copper

B. Textile

C. Steel

D. Automobile

Answer: B

16. Silicon Valley is located in

A. Bangalore

B. California

C. Ahmadabad

D. Osaka

Answer: B

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Glossary (fao.org)

Industry Week's Manufacturing Glossary Industry Week

7.9 TERMINAL QUESTIONS

Long Question

1. Give the definition of Industrial Region. Explaining characteristics with the bases used in demarcation of Industrial Regional.
2. Divide Japan into Industrial Region.
3. Divide Canada or France into Industrial Region.
4. Explain chief methods to delimitate Industrial Region.
5. Describe chief Industrial Region of India.
6. Divide the world into agriculture region according to Whittlessey.
7. Divide USA into agricultural regions.
8. Divide India into agriculture regions.
9. Divide former USSR into agriculture region.
10. Divide China into agriculture regions.

Short Question

1. Write the characteristics of Industrial Region.
2. Describe Tokyo-Yokohama Industrial Region.
3. Describe Industrial Region of Canada.
4. Describe Hooghly Industrial Region.
5. Describe Industrial districts of India.
6. Explain commercial Plantation agricultural regions.
7. Describe shifting cultivation regions.

8. Describe Mediterranean agricultural region.
9. Describe cotton production region of United State of America.
10. Describe Rice-Tea region of China.

**BLOCK-3 TRADING BLOCS, REGIONAL
DEVELOPMENT AND PLANNING**

UNIT-8 CONCEPTS EVOLUTION OF TRADING BLOCS

8.1 OBJECTIVES

8.2 INTRODUCTION

8.3 MAJOR TRADING BLOCS

8.4 TRADING BLOCS IMPACTS ON DIFFERENT SECTORS

8.5 TRADE DISPARITIES

8.6 SUMMARY

8.7 GLOSSARY

8.8 ANSWER TO CHECK YOUR PROGRESS

8.9 REFERENCES

8.10 TERMINAL QUESTIONS

8.1 OBJECTIVES

After reading this unit, you will be able to:

- Understand the meaning of trade disparities.
 - Learn about the Major Trading blocs of the world.
 - Gain knowledge about the trading blocs' impacts on different sectors.
-

8.2 INTRODUCTION

The evolution of trading blocs has been a dynamic and transformative process that has profoundly influenced the landscape of international trade over the years. Trading blocs, also known as regional trade agreements, represent strategic alliances among nations seeking to enhance economic integration by minimizing barriers to commerce and fostering collaborative frameworks. The historical trajectory of trading blocs can be traced back to the early forms of trade cooperation, but it gained significant momentum in the post-World War II era. The primary aim of these blocs is to create a more seamless flow of goods and services among member countries, thereby boosting economic growth and development.

There are various types of trading blocs, each representing a different level of economic integration. From Preferential Trade Agreements (PTAs) and Free Trade Areas (FTAs) to Customs Unions, Common Markets, and Economic and Monetary Unions, the spectrum is wide and nuanced. The European Union (EU), established as the European Economic Community in the 1950s, stands out as a paradigmatic example of deep economic integration, featuring a common currency (Euro) and a single market.

The driving forces behind the evolution of trading blocs are diverse. Economic factors, such as the pursuit of economies of scale and enhanced competitiveness, play a crucial role. Political considerations, including diplomatic alliances and shared geopolitical interests, often underpin the formation of these blocs. Technological changes and the increasing interconnectedness of global markets further fuel the momentum towards regional integration.

While trading blocs offer numerous benefits, they also face challenges and criticisms. Disparities in the distribution of gains, concerns about loss of national sovereignty, and the exclusion of developing countries from the benefits of these agreements are common issues. Internal struggles within blocs, as witnessed during the Brexit negotiations, highlight the complexity of maintaining cohesion among diverse member states.

Recent developments, such as the renegotiation of trade agreements like NAFTA (now USMCA) and the emergence of mega-regional trade pacts, continue to shape the landscape of trading blocs. The ongoing shift in global economic power, coupled with geopolitical realignments, adds layer of complexity.

Importance in the Global Economy

Trading blocs hold immense significance in the intricate tapestry of the global economy, exerting a far-reaching impact on trade dynamics, economic development, and diplomatic relations. At the heart of their importance lies the ability to foster economic integration among member nations. By dismantling trade barriers such as tariffs and quotas, trading blocs create a conducive environment for increased cross-border commerce. This reduction in barriers not only enhances market access but also stimulates a surge in trade volumes, promoting economic growth and stability within the bloc.

Moreover, trading blocs play a pivotal role in attracting foreign direct investment (FDI) by presenting a larger and more cohesive market for businesses. This, in turn, catalyzes technological advancements, fosters innovation, and promotes overall economic competitiveness. The scale and scope of trading blocs enable economies of scale, allowing member countries to specialize in certain industries and optimize resource allocation.

In the realm of diplomacy, trading blocs contribute to the development of strategic partnerships and shared economic interests among member nations. Collaborative efforts within these blocs often extend beyond trade, encompassing areas such as infrastructure development, regulatory alignment, and policy coordination. Such multifaceted cooperation fosters regional stability and can act as a catalyst for peaceful international relations.

As globalization accelerates, trading blocs emerge as key players in shaping the dynamics of the global economy. They not only provide a framework for member nations to navigate the complexities of international trade but also serve as agents of change, influencing broader geopolitical trends and contributing to the evolving landscape of economic interdependence on a global scale. Understanding and navigating the dynamics of trading blocs is increasingly vital for nations seeking to maximize their economic potential and maintain a competitive edge in the interconnected world of trade and commerce.

Brief Overview of the Evolution

The evolution of trading blocs spans centuries, reflecting a dynamic interplay of economic, political, and social forces that have shaped the global trading landscape. Historically, early forms of trade cooperation can be traced back to ancient civilizations, where merchants and traders formed networks to facilitate the exchange of goods across regions. However, the modern concept of trading blocs began to take shape in the aftermath of World War II, to promote economic recovery and stability in war-torn regions. The formation of the European Coal and Steel Community (ECSC) in 1951 marked a significant milestone, laying the groundwork for deeper economic integration among European nations. This initiative culminated in the establishment of the European Economic Community (EEC) in 1957, which evolved into the

European Union (EU) over subsequent decades, representing one of the most ambitious and successful trading blocs in history.

In parallel, other regions around the world began to embrace the concept of trading blocs as a means of enhancing economic cooperation and regional integration. The creation of the North American Free Trade Agreement (NAFTA) in 1994 between the United States, Canada, and Mexico represented a landmark development in North American trade relations, paving the way for the formation of a unified economic space encompassing a significant portion of the continent. Similarly, the Association of Southeast Asian Nations (ASEAN) has played a central role in promoting economic cooperation and integration among its member states since its inception in 1967, leading to the formation of the ASEAN Free Trade Area (AFTA) and the subsequent establishment of the ASEAN Economic Community (AEC) in 2015.

In recent years, the evolution of trading blocs has been characterized by a proliferation of regional trade agreements and the emergence of mega-regional agreements involving multiple countries across different continents. Examples include the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership (RCEP), which collectively encompass a significant share of global trade and investment flows. As the global economy continues to evolve, trading blocs are likely to remain a central feature of the international trading system, shaping economic relations and influencing the broader geopolitical landscape in the years to come.

8.3 MAJOR TRADING BLOCS

The European Union (EU) stands as a prominent political and economic union comprising 27 member states primarily located in Europe, fostering economic cooperation and preventing conflicts among nations (European Union, Europa.eu). North American Free Trade Agreement (NAFTA), established in 1994, aimed to eliminate tariffs and trade barriers between the United States, Canada, and Mexico, later replaced by the United States-Mexico-Canada Agreement (USMCA) in 2020 to modernize the trade dynamics (Office of the United States Trade Representative). Mercosur, formed in 1991, comprises Argentina, Brazil, Paraguay, and Uruguay, aiming to promote economic integration through tariff eliminations (Mercosur). The Association of Southeast Asian Nations (ASEAN), formed in 1967, fosters economic growth and stability among ten Southeast Asian countries (ASEAN). African Continental Free Trade Area (AfCFTA), signed in 2018, aims to boost intra-African trade and foster economic integration across the continent (African Union).

European Union (EU)

European Union (EU) is, an international organization comprising 27 European countries and governing common economic, social, and security policies. Originally confined to Western Europe, the EU undertook a robust expansion into central and eastern Europe in the

early 21st century. The EU's members are Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden. The United Kingdom, which had been a founding member of the EU, left the organization in 2020.

The EU was created by the Maastricht Treaty, which entered into force on November 1, 1993. The treaty was designed to enhance European political and economic integration by creating a single currency (the euro), a unified foreign and security policy, and common citizenship rights and by advancing cooperation in the areas of immigration, asylum, and judicial affairs. The EU was awarded the Nobel Prize for Peace in 2012, in recognition of the organization's efforts to promote peace and democracy in Europe.

The EU represents one in a series of efforts to integrate Europe since World War II. At the end of the war, several Western European countries sought closer economic, social, and political ties to achieve economic growth and military security and to promote a lasting reconciliation between France and Germany. To this end, in 1951 the leaders of six countries—Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany—signed the Treaty of Paris, thereby, when it took effect in 1952, founding the European Coal and Steel Community (ECSC). (The United Kingdom had been invited to join the ECSC and in 1955 sent a representative to observe discussions about its ongoing development, but the Labour government of Clement Attlee declined membership, owing perhaps to a variety of factors, including the illness of key ministers, a desire to maintain economic independence, and a failure to grasp the community's impending significance.) The ECSC created a freetrade area for several key economic and military resources: coal, coke, steel, scrap, and iron ore. To manage the ECSC, the treaty established several supranational institutions: a High Authority to administrate, a Council of Ministers to legislate, a Common Assembly to formulate policy, and a Court of Justice to interpret the treaty and resolve related disputes. A series of further international treaties and treaty revisions based largely on this model led eventually to the creation of the EU.

North American Free Trade Agreement (NAFTA) - now USMCA (United States-Mexico-Canada Agreement)

The United States-Mexico-Canada Agreement (USMCA) entered into force on July 1, 2020. The USMCA, which substituted the North America Free Trade Agreement (NAFTA) is a mutually beneficial win for North American workers, farmers, ranchers, and businesses. The Agreement creates more balanced, reciprocal trade supporting high-paying jobs for Americans and growing the North American economy.

Agreement highlights include:

- Creating a more level playing field for American workers, including improved rules of origin for automobiles, trucks, and other products, and disciplines on currency manipulation.
- Benefiting American farmers, ranchers, and agribusinesses by modernizing and strengthening food and agriculture trade in North America.
- Supporting a 21st Century economy through new protections for U.S. intellectual property, and ensuring opportunities for trade in U.S. services.
- New chapters covering Digital Trade, Anticorruption, and Good Regulatory Practices, as well as a chapter devoted to ensuring that Small and Medium Sized Enterprises benefit from the Agreement.

The North American Free Trade Agreement (NAFTA), signed in 1994, was a groundbreaking trade pact between the United States, Mexico, and Canada, aiming to create a unified trade bloc in North America. Its primary objectives were to eliminate tariffs and trade barriers among the three member countries, fostering increased economic cooperation and integration. NAFTA facilitated significant growth in trade and investment across North America, leading to the development of intricate supply chains and boosting competitiveness in various industries.

However, NAFTA also faced criticism, particularly regarding its impact on jobs and industries within the member countries. Critics argued that the agreement contributed to the outsourcing of manufacturing jobs from the United States to Mexico, resulting in wage stagnation and job losses in certain sectors. Environmental and social concerns were also raised, highlighting potential issues related to labour standards, environmental regulations, and the displacement of vulnerable communities.

In response to these criticisms and amid growing calls for trade reform, negotiations to modernize NAFTA began in 2017 under the Trump administration. The resulting agreement, known as the United States-Mexico-Canada Agreement (USMCA), aimed to address some of the perceived shortcomings of NAFTA while preserving the benefits of trilateral trade cooperation. USMCA introduced several key updates and revisions, including provisions related to digital trade, labour rights, environmental protection, and rules of origin for automotive manufacturing.

USMCA also included new provisions to address emerging challenges in the modern economy, such as intellectual property rights, e-commerce, and regulatory coherence. Moreover, the agreement sought to enhance market access for agricultural products and establish stronger mechanisms for resolving trade disputes among the member countries. By incorporating these

updates and improvements, USMCA aimed to modernize North American trade relations and promote fairer and more sustainable economic growth.

On July 1, 2020, USMCA officially replaced NAFTA, marking a new chapter in North American trade cooperation. The agreement's implementation signalled a commitment by the United States, Mexico, and Canada to strengthen their economic ties while addressing concerns about trade fairness, labour rights, and environmental sustainability. Despite ongoing challenges and debates surrounding trade policy, USMCA represents a significant milestone in the evolution of North American trade relations, laying the groundwork for continued collaboration and prosperity among the three neighbouring countries.

Association of Southeast Asian Nations (ASEAN)

ASEAN is an international organization established by the governments of Indonesia, Malaysia, the Philippines, Singapore, and Thailand in 1967 to accelerate economic growth, social progress, and cultural development and to promote peace and security in Southeast Asia. Brunei joined in 1984, followed by Vietnam in 1995, Laos and Myanmar in 1997, and Cambodia in 1999. The ASEAN region has a population of more than 600 million and covers a total area of 1.7 million square miles (4.5 million square km). ASEAN replaced the Association of South East Asia (ASA), which had been formed by the Philippines, Thailand, and the Federation of Malaya (now part of Malaysia) in 1961. Under the banner of cooperative peace and shared prosperity, ASEAN's chief projects centre on economic cooperation, the promotion of trade among ASEAN countries and between ASEAN members and the rest of the world, and programs for joint research and technical cooperation among member governments.

Held together somewhat tenuously in its early years, ASEAN achieved a new cohesion in the mid-1970s following the changed balance of power in Southeast Asia after the end of the Vietnam War. The region's dynamic economic growth during the 1970s strengthened the organization, enabling ASEAN to adopt a unified response to Vietnam's invasion of Cambodia in 1979. ASEAN's first summit meeting, held in Bali, Indonesia, in 1976, resulted in an agreement on several industrial projects and the signing of a Treaty of Amity and Cooperation and a Declaration of Concord.

The end of the Cold War between the United States and the Soviet Union at the end of the 1980s allowed ASEAN countries to exercise greater political independence in the region, and in the 1990s ASEAN emerged as a leading voice on regional trade and security issues. For example, ASEAN adopted a declaration to resolve disputes in the South China Sea, promoted dialogue on regional security by establishing the ASEAN Regional Forum, and worked to resolve the conflict in East Timor. In 1992 members reduced intraregional tariffs and eased restrictions on foreign investment by creating the ASEAN Free Trade Area.

To signal ASEAN's commitment to international diplomacy, human rights, and democratic values, its member countries signed the ASEAN Charter in 2007. Following its ratification by all 10 member states, the charter entered into force in December 2008. Among other things, the charter conferred legal personality on ASEAN, increased the frequency of ASEAN summit meetings, and established the ASEAN Intergovernmental Commission on Human Rights.

ASEAN summit meetings, which have been scheduled to occur semiannually since the adoption of the charter, bring together the heads of state of member countries; there are also annual conferences for foreign ministers. Relations between ASEAN and other countries are conducted through ASEAN Plus Three, an annual meeting of the heads of state of ASEAN members and the leaders of China, the Republic of Korea, and Japan; ASEAN Plus Six, which includes ASEAN Plus Three and Australia, India, and New Zealand; and the East Asia Summit, a meeting of ASEAN Plus Six and Russia and the United States. Between ASEAN summit meetings the organization's business is directed by a standing committee consisting of the foreign minister of the host country of the ministerial conferences and ambassadors from the other countries. A permanent secretariat in Jakarta, Indonesia, is headed by a secretary-general, whose position rotates every five years. The organization encompasses several committees, including technical committees on finance, agriculture, industry, trade, and transportation. The committees are supplemented by working groups headed by experts and various private-sector organizations.

Mercosur (Southern Common Market)

Mercosur, South American regional economic organization. Mercosur grew out of earlier efforts to integrate the economies of Latin America through the Latin American Free Trade Association (1960) and its successor, the Latin American Integration Association (1980). In 1985 Argentina and Brazil signed the Declaration of Iguazu, which created a bilateral commission to promote the integration of their economies; by the following year, the two countries had negotiated several commercial agreements. The 1988 Treaty for Integration, Cooperation, and Development committed Argentina and Brazil to work toward the establishment of a common market within 10 years, and it invited other Latin American countries to join. Mercosur was created in 1991 by the Treaty of Asunción, which was signed by the heads of state of Argentina, Brazil, Paraguay, and Uruguay. Several other countries were later admitted as associate members, and in 2006 the presidents of the four member countries approved full membership for Venezuela, though its final ascent was blocked for years by the Paraguayan Congress. Mercosur is headquartered in Montevideo, Uruguay.

Mercosur's goals include the harmonization of the economic policies of its members and the promotion of economic development. The Ouro Preto Protocol (1994) established Mercosur's present organizational structure and gave it a legal personality under international law, allowing it to negotiate agreements with countries and other international organizations. On Jan. 1, 1995, following several years of efforts to reduce internal tariffs (tariffs imposed by

members on other members), a free-trade zone and a customs union were formally established. Nevertheless, full harmonization eluded Mercosur: some internal goods were still subject to customs duties, and, though members agreed to apply a common tariff on imports from nonmembers, disparities on such duties continued to exist. In 1996 the Joint Parliamentary Commission, which consists of parliamentarians from member countries, declared that all participating members must have functioning democratic institutions. In 2003 Mercosur signed a free-trade agreement with the Andean Community, which went into effect on July 1, 2004. In 2007 a new parliament of the member states was inaugurated in Montevideo. In 2012, following the controversial impeachment of Paraguayan Pres. Fernando Lugo, Brazil, Argentina, and Uruguay voted to suspend Paraguay's membership until 2013. Later at the same summit where that action was taken, leaders from the three active member countries announced the ascent of Venezuela to full membership, effective July 31, 2012.

African Continental Free Trade Area (AFCFTA)

The African Continental Free Trade Area (AFCFTA) represents a historic agreement signed by 54 out of 55 African Union (AU) member states, with Eritrea being the only non-participant since its establishment in 2018. AFCFTA aims to create a single market for goods and services across the African continent, with the overarching goal of fostering economic integration, boosting intra-African trade, and driving sustainable development. By eliminating tariffs and non-tariff barriers to trade, AFCFTA seeks to expand market access, promote industrialization, and enhance Africa's competitiveness in the global economy.

Upon its implementation, AFCFTA is expected to be the largest free trade area in the world by the number of participating countries, encompassing a population of over 1.3 billion people and a combined GDP exceeding \$3 trillion. The agreement holds the potential to transform Africa's economic landscape, unlocking new opportunities for businesses, entrepreneurs, and investors while addressing the continent's developmental challenges. By promoting intra-African trade, AFCFTA aims to reduce reliance on external markets and diversify African economies, thereby promoting resilience and sustainability.

AFCFTA is structured around several key components, including the elimination of tariffs on 90% of goods traded within the continent over a five to ten-year period, the liberalization of trade in services, the establishment of a mechanism for resolving trade disputes, and the promotion of regional value chains and cross-border investment. Additionally, the agreement includes provisions to address non-tariff barriers, facilitate customs cooperation, and promote infrastructure development and connectivity across Africa.

Despite its potential benefits, AFCFTA also faces various challenges, including logistical hurdles, regulatory complexities, and the need for institutional capacity building. Moreover, the successful implementation of the agreement requires coordinated efforts from governments, private sector stakeholders, civil society organizations, and development partners. However, with

political will, commitment, and collaboration, AfCFTA holds the promise of driving inclusive and sustainable growth, advancing economic integration, and fostering prosperity for the people of Africa. As the continent moves forward with the implementation of AfCFTA, it embarks on a transformative journey towards a more integrated, prosperous, and interconnected Africa.

8.4 TRADING BLOCS IMPACTS ON DIFFERENT SECTORS

Trading blocs have significant impacts on various sectors, spanning the economy, politics, and technical realms. Economically, they foster increased trade and investment flows among member countries, leading to enhanced market access, economies of scale, and specialization. Politically, trading blocs can strengthen diplomatic ties and cooperation, promoting peace and stability among member states while also influencing global geopolitical dynamics. On a technical level, trading blocs necessitate harmonization of regulations and standards, facilitating smoother cross-border transactions and promoting the development of common infrastructure and technologies. Additionally, they may lead to shifts in comparative advantage, changes in domestic industries, and adjustments in government policies to adapt to the requirements and opportunities presented by the bloc.

Economic Factors

Trading blocs exert significant influence on economic factors, profoundly shaping the trajectory of member countries' economies. At their core, trading blocs aim to liberalize trade by reducing or eliminating tariffs and other barriers to the movement of goods and services among member states. This reduction in trade barriers fosters increased commerce, leading to expanded market access for businesses within the bloc. As a result, member countries often experience higher levels of trade volumes and increased cross-border investment, which can stimulate economic growth and development. Moreover, trading blocs promote the creation of regional value chains and specialization, as countries capitalize on their comparative advantages to produce goods and services more efficiently, thus enhancing overall productivity and competitiveness.

Furthermore, trading blocs can serve as engines for economic integration, facilitating closer economic cooperation and coordination among member states. This integration often involves the harmonization of trade-related policies, regulatory frameworks, and standards, which streamlines cross-border transactions and reduces transaction costs for businesses operating within the bloc. Additionally, trading blocs provide a platform for member countries to negotiate collectively with external trading partners, enhancing their bargaining power in international trade negotiations and enabling them to secure more favourable trade agreements.

However, while trading blocs offer numerous economic benefits, they also pose challenges and considerations for member countries. For instance, increased trade integration can expose domestic industries to greater competition from foreign firms, leading to potential

disruptions and adjustments within the domestic economy. Moreover, disparities in economic development and competitiveness among member countries can create uneven distributional effects, exacerbating inequalities and disparities within the bloc. Additionally, the success of trading blocs depends heavily on effective governance structures, institutional frameworks, and mechanisms for resolving disputes and addressing divergent interests among member states. Overall, while trading blocs offer opportunities for economic growth and integration, their success hinges on careful management and cooperation among member countries to navigate the complexities and challenges of global trade.

Political Factors

Trading blocs wield significant political influence, transcending mere economic considerations to shape diplomatic relations, geopolitical dynamics, and regional stability. By fostering closer economic ties among member countries, trading blocs often create a shared vested interest in maintaining peace and stability within the region. This economic interdependence can serve as a powerful deterrent to conflict, as member states have a strong incentive to resolve disputes through dialogue and negotiation rather than resorting to hostile measures that could disrupt trade and economic cooperation. Furthermore, trading blocs can promote diplomatic cooperation and collaboration among member countries, providing a forum for dialogue and coordination on a range of political issues, from security and defence to environmental protection and human rights.

Moreover, trading blocs can also influence broader geopolitical dynamics by shaping patterns of alignment and influence within the international system. By deepening economic integration among member countries, trading blocs can enhance their collective geopolitical weight and influence on the global stage. This increased cohesion and coordination can enable member countries to pursue common diplomatic objectives, amplify their voices in international forums, and exert greater leverage in negotiations with external partners. Additionally, trading blocs can serve as a vehicle for projecting soft power and promoting shared values and norms among member countries, thereby reinforcing regional identities and solidarity.

However, while trading blocs offer opportunities for political cooperation and influence, they also present challenges and complexities. The process of forming and maintaining trading blocs often involves navigating complex political dynamics, including divergent interests and priorities among member countries. Managing these differences requires effective governance structures, institutional mechanisms, and diplomatic dialogue to build consensus and resolve disputes. Moreover, the exclusion of non-member countries from trading bloc arrangements can potentially exacerbate tensions and rivalries, particularly if neighbouring countries perceive the bloc as exclusionary or discriminatory. Overall, while trading blocs have the potential to promote political cooperation and stability, their success hinges on the ability of member countries to navigate and manage the intricate political dynamics inherent in regional integration efforts.

Technological Changes

Trading blocs play a crucial role in driving technological changes by fostering innovation, facilitating the diffusion of technology, and promoting collaboration in research and development (R&D) among member countries. By reducing trade barriers and increasing market access, trading blocs create larger and more integrated markets, which can incentivize firms to invest in innovation and adopt new technologies to remain competitive. Additionally, trading blocs often include provisions aimed at promoting technological cooperation and knowledge-sharing among member countries, such as joint R&D initiatives, technology transfer programs, and the establishment of common standards and regulations. These efforts can lead to the development of new technologies, the adaptation of existing technologies to local contexts, and the creation of synergies and complementarities among member countries' technological capabilities.

Furthermore, trading blocs can serve as catalysts for digital transformation and the adoption of emerging technologies, such as artificial intelligence, blockchain, and the Internet of Things (IoT). As trading blocs modernize trade processes and streamline customs procedures, they create opportunities for the digitalization of trade-related activities, such as e-commerce, digital payments, and online platforms for trade facilitation. This digitalization not only enhances the efficiency and transparency of cross-border transactions but also promotes the integration of digital technologies into various sectors of the economy, driving productivity gains and innovation.

Moreover, trading blocs can influence the direction and pace of technological development by shaping regulatory frameworks and policy priorities. As member countries harmonize their regulations and standards to facilitate trade within the bloc, they may also align their policies to promote innovation, investment in R&D, and the adoption of emerging technologies. Additionally, trading blocs can leverage their collective bargaining power to negotiate favourable terms for access to technology and intellectual property rights with external partners, thereby promoting technology transfer and diffusion across borders.

However, while trading blocs offer opportunities for technological advancement and innovation, they also present challenges and considerations. The uneven distribution of technological capabilities among member countries can create disparities in the benefits derived from technological changes, potentially exacerbating inequalities within the bloc. Moreover, the rapid pace of technological change may outpace the ability of regulatory frameworks to adapt, leading to gaps in governance and potential risks related to privacy, security, and ethical concerns. Therefore, effective collaboration and coordination among member countries are essential to harness the transformative potential of technological changes within trading blocs while addressing the associated challenges and ensuring that the benefits are shared equitably.

Globalization

Trading blocs have a profound impact on the process of globalization, influencing the flow of goods, services, capital, and information across national borders. At their core, trading blocs represent regional agreements aimed at reducing barriers to trade and promoting economic integration among member countries. By facilitating increased trade and investment flows within a defined geographic area, trading blocs contribute to the deepening of economic interdependence among member states and the creation of regional markets with common rules and regulations. This integration within trading blocs serves as a microcosm of the broader forces driving globalization, as it fosters closer economic ties and cooperation among countries on a regional scale.

Moreover, trading blocs play a significant role in shaping the contours of the global economy by influencing patterns of production, consumption, and distribution across regions. By promoting the creation of regional value chains and specialization, trading blocs facilitate the efficient allocation of resources and the optimal utilization of comparative advantages within the bloc. This process of economic integration and specialization often leads to increased productivity, efficiency gains, and enhanced competitiveness for businesses operating within the trading bloc, thereby driving economic growth and development at the regional level.

Furthermore, trading blocs serve as important agents of change in the context of globalization by influencing global trade dynamics and geopolitical alignments. The formation of trading blocs can lead to shifts in trade patterns and realignment of economic interests, as member countries prioritize intra-bloc trade and investment over external markets. This can have ripple effects on global supply chains, trade flows, and investment patterns, reshaping the distribution of economic power and influence on the global stage. Additionally, trading blocs can serve as vehicles for promoting shared norms, standards, and regulations, which can have far-reaching implications for global governance and regulatory frameworks.

However, while trading blocs contribute to the deepening of globalization, they also pose challenges and tensions for the broader process of global integration. The proliferation of trading blocs can lead to fragmentation and balkanization of the global trading system, as countries prioritize regional interests over broader multilateral cooperation. This can potentially undermine the principles of non-discrimination and inclusivity that underpin the multilateral trading system and impede efforts to address global challenges such as poverty, inequality, and climate change. Moreover, the rise of protectionist tendencies within trading blocs can exacerbate trade tensions and provoke retaliatory measures, leading to increased volatility and uncertainty in the global economy. Therefore, while trading blocs play a crucial role in shaping globalization, their impact must be carefully managed and coordinated to ensure that they contribute to a more open, inclusive, and sustainable global economy.

8.5 TRADE DISPARITIES

Trade disparities refer to differences in the balance of trade, trade volumes, and trade relationships between countries or regions. These disparities can arise from a variety of factors, including differences in economic development, resource endowments, trade policies, and market access. One common manifestation of trade disparities is trade imbalances, where one country exports significantly more goods and services than it imports, leading to a surplus in its trade balance, while another country imports more than it exports, resulting in a deficit. These imbalances can contribute to asymmetrical patterns of trade and investment, with some countries benefiting disproportionately from global trade while others face challenges in achieving economic growth and development.

Moreover, trade disparities can also manifest in terms of unequal access to markets and opportunities in the global trading system. Developing countries, in particular, often face barriers to entry into international markets, including high tariffs, non-tariff barriers, and stringent regulatory requirements imposed by developed countries. These barriers can limit developing countries' ability to export their goods and services competitively and can hinder their integration into global value chains. As a result, developing countries may find themselves marginalized or excluded from certain sectors or markets, exacerbating existing disparities in income, wealth, and development.

Furthermore, trade disparities can contribute to structural imbalances within and between economies, leading to inequities in income distribution, employment opportunities, and access to resources. For example, trade liberalization and globalization can lead to the outsourcing of manufacturing jobs from developed countries to lower-cost production centres in developing countries, resulting in job losses and wage stagnation in certain sectors of the economy. Similarly, unequal trade relationships can exacerbate dependency and vulnerability among smaller or less-developed economies, as they become overly reliant on a narrow range of exports or vulnerable to fluctuations in global commodity prices.

Addressing trade disparities requires concerted efforts at the national, regional, and international levels to promote inclusive and sustainable development. This includes implementing policies to enhance the competitiveness of domestic industries, improve market access for exports, and diversify sources of growth and income. Additionally, fostering greater cooperation and coordination among countries and regions through trade agreements, development assistance, and capacity-building initiatives can help reduce trade disparities and promote shared prosperity. Moreover, addressing underlying structural issues, such as income inequality, social exclusion, and inadequate infrastructure, is essential for creating an enabling environment for equitable and sustainable trade relations. Ultimately, by addressing trade disparities and promoting more balanced and inclusive patterns of trade and investment, countries can harness the potential of global trade to advance economic development, reduce poverty, and achieve shared prosperity for all.

Internal Struggles within Blocs

Internal struggles within trading blocs can arise from a variety of factors, ranging from divergent economic interests and policy priorities to geopolitical tensions and institutional challenges. One common source of internal strife is the economic disparities among member countries within the bloc. Economic gaps between wealthier and less-developed member states can lead to unequal distribution of benefits from trade integration, exacerbating disparities in income, wealth, and development. Wealthier countries may seek to prioritize their economic interests and agenda, while less-developed countries may demand greater concessions and assistance to address their development needs. These disparities can strain cohesion within the bloc and impede progress on common policy objectives, such as trade liberalization and regulatory harmonization.

Geopolitical tensions and rivalries among member countries can also fuel internal struggles within trading blocs. Competition for influence, resources, and strategic advantages can create friction and mistrust among member states, undermining cooperation and solidarity within the bloc. Geopolitical considerations may influence decision-making processes within the bloc, as member countries seek to advance their national interests and agendas. Moreover, geopolitical conflicts and disputes between member countries can spill over into trade relations, complicating efforts to deepen economic integration and cooperation within the block.

Institutional challenges and governance issues can further exacerbate internal struggles within trading blocs. Weak institutional frameworks, inadequate enforcement mechanisms, and lack of transparency can undermine trust and confidence among member countries, hindering effective decision-making and implementation of common policies. Moreover, differences in legal systems, regulatory frameworks, and administrative capacities among member states can complicate efforts to achieve regulatory harmonization and facilitate cross-border trade and investment. Addressing these institutional challenges requires sustained efforts to strengthen governance structures, enhance institutional capacity, and foster greater accountability and transparency within the bloc.

Furthermore, divergent policy priorities and national interests among member countries can lead to internal disagreements and conflicts within trading blocs. Member countries may have different objectives and preferences regarding trade liberalization, market access, regulatory standards, and social and environmental policies. These divergences can create tensions and deadlock within the bloc, as member countries struggle to reconcile their competing interests and reach consensus on common policy objectives. Overcoming these internal disagreements requires constructive dialogue, compromise, and negotiation among member countries, as well as effective leadership and diplomatic mediation to facilitate consensus-building and decision-making within the bloc.

8.6 SUMMARY

The concept of trading blocs has undergone a remarkable evolution since its inception, reflecting changing dynamics in the global economy, politics, and technology. Initially emerging as regional agreements primarily focused on reducing tariffs and trade barriers among neighbouring countries, trading blocs have evolved into multifaceted entities with broader economic integration goals. Over time, the scope of trading blocs has expanded to include not only the liberalization of trade but also the harmonization of regulations, coordination of policies, and development of common institutions. This evolution reflects a recognition among member countries of the potential benefits of deeper integration, including enhanced market access, economies of scale, and increased competitiveness in global markets.

Moreover, the evolution of trading blocs has been influenced by geopolitical considerations, with countries increasingly viewing regional alliances as a means to enhance their strategic interests and influence on the global stage. Trading blocs serve as platforms for diplomatic cooperation and coordination among member states, enabling them to collectively address shared challenges and pursue common objectives. In this sense, trading blocs have become instrumental in shaping geopolitical dynamics and power structures, as countries seek to leverage regional alliances to advance their economic and political agendas.

Furthermore, technological advancements have played a crucial role in driving the evolution of trading blocs, facilitating deeper economic integration and connectivity among member countries. The advent of digitalization, automation, and e-commerce has enabled the seamless flow of goods, services, and capital across borders, reducing transaction costs and facilitating cross-border trade. This has led to the emergence of new opportunities and challenges within trading blocs, as member countries seek to harness the potential of technology to enhance productivity, competitiveness, and innovation.

8.7 GLOSSARY

- **Trading Blocs:** Trading blocs are groups of countries that form agreements to reduce or eliminate barriers to trade among themselves while maintaining trade barriers with countries outside the bloc. These agreements can range from preferential trade arrangements to full economic integration.
- **Economic Integration:** Economic integration refers to the process by which countries or regions reduce or eliminate barriers to trade and investment, leading to deeper economic cooperation and coordination. This can include the establishment of a common market, customs union, or monetary union.
- **Tariff:** A tariff is a tax or duty imposed on imported or exported goods, usually as a percentage of their value. Tariffs are often used to protect domestic industries from foreign competition or to generate revenue for the government.

- **Customs Union:** A customs union is a form of economic integration in which member countries agree to eliminate tariffs and other trade barriers among themselves and adopt a common external tariff on imports from countries outside the union.
- **Common Market:** A common market is a type of economic integration in which member countries not only eliminate tariffs and other trade barriers but also allow for the free movement of goods, services, capital, and labour among themselves.
- **Regionalism:** Regionalism refers to the process of countries or regions coming together to form agreements or institutions aimed at promoting economic cooperation and integration within a specific geographic area.
- **Geopolitics:** Geopolitics is the study of the influence of geography, politics, and economics on international relations and the behaviour of states. In the context of trading blocs, geopolitics often plays a significant role in shaping regional alliances and power dynamics.
- **Technological Advancements:** Technological advancements, such as digitalization, automation, and e-commerce, have played a crucial role in driving the evolution of trading blocs by facilitating deeper economic integration, reducing transaction costs, and enabling cross-border trade.
- **Globalization:** Globalization refers to the increasing interconnectedness and interdependence of economies, societies, and cultures on a global scale. Trading blocs are an integral part of the process of globalization, as they contribute to the deepening of economic integration and the expansion of international trade and investment.
- **Policy Coordination:** Policy coordination refers to the process by which member countries of a trading bloc align their economic policies, regulations, and institutions to promote greater coherence and consistency in their approach to trade and economic cooperation. This coordination is essential for the effective functioning of trading blocs and the achievement of their objectives.

8.8 ANSWER TO CHECK YOUR PROGRESS

1. What is the primary objective of trading blocs?

- A) To increase barriers to trade among member countries
- B) To reduce barriers to trade among member countries
- C) To promote isolationism
- D) To restrict economic growth

Answer: B)

2. What is a customs union?

- A) A group of countries with a common currency
- B) A group of countries with no trade agreements
- C) A group of countries with a common external tariff
- D) A group of countries with no tariffs

Answer: C)

3. Which of the following is an example of a regional trading bloc?

- A) World Trade Organization (WTO)
- B) International Monetary Fund (IMF)
- C) European Union (EU)
- D) United Nations (UN)

Answer: C)

4. What role do technological advancements play in the evolution of trading blocs?

- A) They hinder economic integration
- B) They promote isolationism
- C) They facilitate deeper economic integration
- D) They have no impact on trading blocs

Answer: C)

5. What is the study of the influence of geography, politics, and economics on international relations called?

- A) Economics
- B) Politics
- C) Geopolitics
- D) Geography

Answer: C)

6. Which of the following is a type of economic integration that allows for the free movement of goods, services, capital, and labour among member countries?

- A) Customs union
- B) Common market
- C) Preferential trade agreement
- D) Free trade area

Answer: B)

7. What is the process by which member countries align their economic policies, regulations, and institutions to promote greater coherence and consistency in their approach to trade and economic cooperation?

- A) Economic isolationism
- B) Policy coordination
- C) Regionalism
- D) Globalization

Answer: B)

8. Which of the following is NOT an example of a major trading bloc?

- A) North American Free Trade Agreement (NAFTA)
- B) Association of Southeast Asian Nations (ASEAN)
- C) African Continental Free Trade Area (AfCFTA)
- D) International Monetary Fund (IMF)

Answer: D)

9. What term refers to the increasing interconnectedness and interdependence of economies, societies, and cultures on a global scale?

- A) Regionalism
- B) Globalization
- C) Protectionism
- D) Nationalism

Answer: B)

8.9 REFERENCES

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8.10 TERMINAL QUESTIONS

1. Discuss the historical context and motivations behind the formation of trading blocs. How have trading blocs evolved, and what factors have influenced their development?
2. Explain the concept of economic integration and its significance in the context of trading blocs. Discuss the different forms of economic integration and how they contribute to deeper regional cooperation and coordination.
3. Analyze the role of geopolitical considerations in shaping the evolution of trading blocs. How have regional alliances and power dynamics influenced the formation and functioning of trading blocs?
4. Describe the impact of technological advancements, such as digitalization and automation, on the evolution of trading blocs. How have these advancements facilitated deeper economic integration and connectivity among member countries?
5. Compare and contrast the objectives and structures of different trading blocs, such as the European Union, Mercosur, ASEAN, and AFCFTA. How do these blocs differ in their approaches to economic integration and regional cooperation?
6. Explore the potential future directions of trading blocs in light of emerging trends and challenges, such as digital trade, climate change, and geopolitical tensions. How will trading blocs adapt to these changing dynamics to remain relevant and effective in the global economy?

UNIT-9 CONTINENTAL TRADING: OPEC, EEC, USA

9.1 OBJECTIVES

9.2 INTRODUCTION

9.3 OPEC

9.3.2 EUROPEAN ECONOMIC COMMUNITY (EEC)

9.3.3 USA

9.4 SUMMARY

9.5 GLOSSARY

9.6 ANSWER TO CHECK YOUR PROGRESS

9.7 REFERENCES

9.8 TERMINAL QUESTIONS

9.1 OBJECTIVES

After having the detailed study of this unit you will be able to

- Establishment of a customs union with a common external tariff
- Common policies for trade, including the Common Agricultural Policy, transport and standardization in Europe
- You will understand that the expansion of the European Union to the rest of Europe
- The EEC also aimed to maintain peace and liberty among their members and all of Europe. It became a prime focus after the EEC became the EC.
- You will learn that the Founding Fathers established a common market and customs union among themselves. Markets facilitate easy flow of goods, services, capital and information among the members.

9.2 INTRODUCTION

International trade refers to the exchange of products and services between various countries. In today's complicated economy, even the greatest country cannot be totally self-sufficient. Every country has some items that exceed its requirements, while others fall short. As a result, each country exports more things than it requires and imports additional goods. International trade has a very long history. The Old Silk Road was used to transport goods from China to South-West Asia in antiquity. Caravans passing along this southern land route traded in silk, iron products, and spices. International trade has existed since prehistoric times. Columbus' accidental discovery of America was driven by a desire for trade. People from India, China, Arabia, Rome, the Netherlands, and the United Kingdom, among others, have made significant contributions to the expansion of international trade.

9.3 OPEC

OPEC, or Organization of the Petroleum Exporting Countries, is an international organization founded to coordinate its members' petroleum policy and give technical and economic assistance.

Membership and organization

OPEC was founded at a summit in Baghdad on September 10-14, 1960, and formally organized in January 1961 by five countries: Saudi Arabia, Iran, Iraq, Kuwait, and Venezuela. Members accepted subsequently include Qatar (1961), Indonesia (1962), Libya (1962), Abu Dhabi (1967), Algeria (1969), Nigeria (1971), Ecuador (1973), Angola (2007), Equatorial Guinea (2017), and the Republic of Congo (2018). The United Arab Emirates—including Abu

Dhabi (the largest emirate), In the 1970s, Dubai, 'Ajmān, Sharjah, Umm al-Qaywayn, Ra's al-Khaymah, and Al-Fujayrah joined Abu Dhabi as members. Gabon, which had joined in 1975, withdrew in January 1995 until rejoining in 2016. Ecuador suspended its OPEC membership from 1992 to 2007, while Indonesia suspended its membership in 2009 before briefly rejoining in 2016. During a prolonged blockade imposed by other OPEC members, Qatar withdrew its membership in January 2019 to focus on natural gas production.

In the 1970s, Dubai, 'Ajmān, Sharjah, Umm al-Qaywayn, Ra's al-Khaymah, and Al-Fujayrah joined Abu Dhabi as members. Gabon, which had joined in 1975, withdrew in January 1995 until rejoining in 2016. Ecuador suspended its OPEC membership from 1992 to 2007, while Indonesia suspended its membership in 2009 before briefly rejoining in 2016. During a prolonged blockade imposed by other OPEC members, Qatar withdrew its membership in January 2019 to focus on natural gas production.

OPEC asserts that its members together possess around four-fifths of the world's proven petroleum reserves, while accounting for two-fifths of global oil production. Members differ in a variety of aspects, such as oil reserve size, location, religion, and economic and political interests. Some members, such as Kuwait, Saudi Arabia, and the United Arab Emirates, have very substantial per capita oil reserves; they are also quite strong financially, giving them significant flexibility in altering production. Saudi Arabia, with the world's second-largest reserves and a small (but rapidly expanding) population, has long dominated global production and prices. Venezuela, on the other hand, has the biggest reserves but produces barely a fraction of Saudi Arabia's output.

Because OPEC has been plagued by conflicts throughout its history, some experts believe it is not a cartel—or at least not an effective one—and has little, if any, control over oil production or price. Other experts agree that OPEC is an effective cartel, albeit not always. The issue is mostly on semantics and the definition of what defines a cartel. Those who claim that OPEC is not a cartel emphasize each member country's sovereignty, the inherent difficulties of coordinating price and production plans, and countries' proclivity to break earlier agreements at ministerial meetings. Those who say OPEC is a cartel contends that production costs in the Persian Gulf are generally less than 10% of the price charged, and those prices would fall towards those levels if OPEC did not coordinate output.

Individual OPEC members' influence on the organization and the oil market is usually determined by their reserve and production levels. Saudi Arabia, which holds around one-third of OPEC's total oil reserves, is a key player in the organization. Iran, Iraq, Kuwait, and the United Arab Emirates are all prominent members, with total reserves that far exceed Saudi Arabia's. Kuwait, with a fairly tiny population, has shown a readiness to reduce production compared to the amount of its reserves, but Iran and Iraq, both with big and expanding populations, have traditionally produced at high levels in relation to reserves. Revolutions and conflicts have limited several OPEC members' ability to maintain high levels of production.

History

When OPEC was founded in 1960, its primary purpose was to prevent its concessionaires—the world's major oil producers, refiners, and marketers—from lowering the oil price, which they had traditionally determined, or "posted." OPEC members attempted to acquire more control over oil prices by coordinating their production and export plans, albeit each member maintained ultimate authority over its own policy. OPEC was able to keep prices from falling during the 1960s, but its success promoted production increases, resulting in a slow slide in nominal prices (not adjusted for inflation) from \$1.93 per barrel in 1955 to \$1.30 per barrel in 1970. During the 1970s, OPEC countries' principal goal was to achieve complete control over their petroleum resources. Consequently, numerous OPEC members nationalized their oil reserves and altered their contracts with major oil companies.

In October 1973, OPEC raised oil prices by 70%. Prices rose by an additional 130 percent in December, two months after the Yom Kippur War (see Arab-Israeli wars), and the organization's Arab members, who had formed OAPEC (Organization of Arab Petroleum Exporting Countries) in 1968, curtailed production and imposed an embargo on oil shipments to the United States and the Netherlands, Israel's main supporters during the war. As a result, the West experienced catastrophic oil shortages and spiraling inflation. As OPEC proceeded to boost prices for the remainder of the decade (prices soared tenfold between 1973 and 1980), its political and economic dominance expanded. Many OPEC nations, flush with petrodollars, launched large-scale domestic economic and social development programmes and made significant investments abroad, particularly in the United States and Europe. OPEC also set up an international fund to help poor countries.

Although oil-importing countries responded slowly to price rises, they gradually lowered their overall energy use, discovered new supplies of oil (for example, in Norway, the United Kingdom, and Mexico), and developed other energy sources such as coal, natural gas, and nuclear power. In response, OPEC nations, particularly Saudi Arabia and Kuwait, decreased production levels in the early 1980s in an unsuccessful attempt to defend their stated prices.

During the 1980s, production and prices continued to plummet. Although Saudi Arabia bore the brunt of the production cuts, with oil profits falling by four-fifths by 1986, revenues from all producers, including non-OPEC countries, plummeted by two-thirds during the same period, as oil prices plunged to less than \$10 per barrel. The decline in revenues, combined with the ruinous Iran-Iraq War (1980-88), which pitted two OPEC members against each other, harmed the organization's unity and precipitated a major policy shift by Saudi Arabia, which decided to defend its market share rather than the price of oil.

Following Saudi Arabia's lead, other OPEC members quickly voted to keep production caps. Saudi Arabia's influence inside OPEC was also obvious during the Persian Gulf War (1990-91), which arose from the invasion of one OPEC member (Kuwait) by another (Iraq), when the kingdom agreed to increase output in order to stabilize prices and minimize disruptions in the worldwide oil market.

OPEC's emphasis on output quotas lasted into the 1990s. Oil prices, which had collapsed at the end of the decade, began to rise again in the early twenty-first century, owing to greater unity among OPEC members and improved cooperation with nonmembers (such as Mexico, Norway, Oman, and Russia), increased Middle Eastern tensions, and a political crisis in Venezuela. After reaching record highs in 2008, prices fell again during the global financial crisis and Great Recession. Meanwhile, international efforts to minimize the use of fossil fuels (which has greatly contributed to global warming; see greenhouse effect) increased the likelihood that global demand for oil would inevitably fall. In response, OPEC endeavored to create a consistent environmental policy. OPEC's power has fluctuated since its inception in 1960, and it is likely to continue to do so for as long as oil is a viable energy source.

Organization

- In 1970, OPEC took control over the global system of oil production by replacing the seven sisters. Coordination among the members of OPEC was the key to success.
- The supreme authority of the firm is the OPEC conference. The oil ministers of member nations head the meetings.
- The OPEC secretary-general is the chief executive of the group.
- Each member nation pays an equal membership fee to contribute to the annual budget.
- The OPEC operates on the 'one member, one vote' rule.

Facts

Some facts about OPEC: The intergovernmental organizations are:

- It was formed to regulate the price and supply of global crude oil.
- Previously, OPEC was headquartered in Geneva, Switzerland.
- But on September 1, 1965, the headquarters were moved to Vienna, Austria. Although Austria is not a member of OPEC.
- OPEC is trying to form a 10-country alliance led by Russia for oil. It is because Russia is the second-largest oil producer after Saudi Arabia. Iran, however, is against this alliance because then Russia and Saudi Arabia will dominate the OPEC.
- OPEC nations supply 37.1% of the world's crude oil.
- 81.5% of the world's proven oil reserves are controlled by OPEC nations.
- OPEC decides the amount of oil a particular member nation can produce.

- Member nations are reported to cheat on their production commitments frequently to earn more money.
- OPEC was formed to get a better grip on the global crude oil market.

Advantages and disadvantages of OPEC

There are numerous benefits to having a cartel like OPEC functioning in the crude oil sector. First, it encourages cooperation among member states, thereby reducing political antagonism to some extent. And, given the organizations primary purpose is to stabilize oil output and prices; it has some influence over other countries' production.

OPEC's market influence has been heavily criticized. Because its member countries own huge crude oil reserves (80.4%, according to the OPEC website), the organization has significant weight in these markets. OPEC has complete influence over the market's oil prices, allowing it to set them as it wishes. Many countries have contested their dominant position in the global market.

9.3.2 EUROPEAN ECONOMIC COMMUNITY (EEC)

Nature and Its Economic Impact

Nature of EEC:

The European Economic Community (EEC) was Europe's most extensive attempt at economic integration.

In a treaty signed in Rome on March 24, 1957, the six Western European countries, France, Germany, Italy, Belgium, the Netherlands, and Luxembourg, agreed to merge their respective economies into a single economic unit by establishing a common market area, also known as the 'Inner Six' system. This six-country agreement to establish a shared market area, generally known as the European shared Market (ECM), went into effect on January 1, 1958.

The overarching mission of the Common Market, as defined in the Treaty of Rome, is to establish a customs union of the six signatories in order to create a larger market area, with the goal of gradually transitioning to an economic union by the end of the transition period (circa 1970) and eventually to complete political integration - a European Union.

However, the EEC's immediate goal was to capitalize on the benefits of specialized specialization and division of labor by strengthening the integrated region of the 'Inner Six', ensuring the harmonious development of economic activities, sustained and balanced growth,

increased stability, faster improvement in the standard of living, and closer relations among its constituent states.

The European Economic Community (EEC), sometimes known as the European Collective Economic Community, represented Europe's most comprehensive economic union project. It was established under the European Economic Community Act. And its primary goal was to foster trade and economic cooperation among European nations. Several countries took part in its organization, including the following:

1. Belgium
2. Germany
3. France
4. Italy
5. Luxembourg
6. Netherlands

Customs union:

The creation of a customs union with six member countries is a key component of the ECM. This customs union compares the organization of a single customs area of participating countries to the customs territory of each individual nation.

A customs union provides complete freedom for the movement of goods and services between the outside world and the partner countries. In a customs union, members establish a standard tariff policy that applies to the outside world, and all tariffs between members are eliminated.

Economic integration:

The Common Market's objective extends beyond the establishment of a customs union. Its goal is a wide economic unification. The Treaty of Rome's beneficial objectives include the free movement of labor and capital within the Economic Community, the coordination of the Member States' national economic policies, the harmonious development of the Community's economic activities as a whole, and the promotion of closer relations among its member states. To accomplish all of this, Member States committed under the Treaty of Rome to:

1. Removal of customs duties and import-export quotas between each other;
2. Establishment of a common tariff and commercial policy for outside countries;
3. Elimination within the Community of barriers to the free movement of labor and capital;

4. Opening of common agricultural and transport policies;
5. Establishment of a system ensuring competition in the Common Market;
6. Adoption of procedures for coordinating the economic policies of the Member States and for addressing their balance of payments. The basic goals in the coordination process include external balance, full employment and price stability;
7. Coordination of the legislation of the Member States for the smooth functioning of the Common Market;
8. The establishment of a European Social Fund to reduce the problem of re-employment of workers facing unemployment as a result of trade liberalization;
9. Creation of a European Investment Fund which will give financial assistance to industrialists to improve the conditions of workers in underdeveloped areas of the constituent states. Another objective of such funds is to help finance projects of European importance;
10. Association of dependent overseas territories within the economic community. Therefore, an Overseas Development Fund was also established in 1958, empowered to provide loans for projects in affiliated overseas territories.

Above all, the Treaty of Rome provided for the admission of new members, whether full or associate.

Above all, the Treaty of Rome provided for the admission of new members, whether full or associate. For example, in 1961, England and Denmark negotiated full membership, but it did not materialize. Greece, on the other hand, was admitted to the ECM as an associate member in 1961 under the provision of associate membership.

Organization of EEC:

The European Economic Community functions as a super-government in terms of economic issues and interactions within the Community. As with any government, there are particular agencies in charge of carrying out orders, making laws, and resolving disputes. Its main administrative entity is the European Economic Council. It is a form of economic cabinet for the six component states. It has a member in each of the six states.

It serves as the community's executive agent. It is in charge of making day-to-day decisions, developing codes of conduct, enacting new legislation, and appointing members to carry out treaty requirements. To help the Council, a nine-member European Commission has been formed. The Commission will examine the application of the Treaty, investigate specific issues, and make recommendations to the Council.

A Monetary Committee is also constituted as an advisory committee to investigate the community's balance of payments and other related issues.

Furthermore, the European Economic and Social Committee have been established as an advisory body made up of representatives from business, labor, agriculture, and other sectors. The Assembly of 106 members is constituted for legislative purposes in the community.

Courts are also formed to resolve conflicts.

Impact of EEC:

The EEC's main impact has been the development of larger markets and economies of scale. Because of their great elasticity, trade formation in manufactured commodities generates significant revenues within the society.

Furthermore, the most significant outcome of the Common Market has been the breakdown of monopolies in nations such as France. As a result, boosting competition can lead to increased productivity.

In short, the Common Market had a profound economic, political, and social impact on its members. However, the Common Market has a significant economic impact on the growth of Europe as a whole and in other countries. The expanding prosperity of the Common Market (which includes six countries) cannot be ignored by the rest of the globe. They saw the EEC regions' rise as both a source of competition and opportunity.

The European Union is one of the world's strongest regional organizations, but Britain's choice to leave has raised concerns about its future expansion, as Britain is the union's largest contributor. However, no organization is built on the basis of a single person; instead, all individuals play a vital part in the organization. Serbia, Herzegovina, Albania, and other countries are ready to join the union. Along with Eastern European countries, Turkey, a geographically isolated country from Europe, is seeking EU membership. Some EU countries disagree to Turkey's inclusion.

Europe is currently experiencing the largest migrant and refugee crisis since World War II. The main reason of this issue is the unrest in Asian and African countries. Syria's civil war, the Arab revolution, unrest in Yemen, and other factors have exacerbated the problem. This situation was brought to the world's attention in 2015, when a huge number of refugees began crossing the Mediterranean Sea and travelling to Europe via South-Eastern Europe in search of sanctuary.

The European Union started Operation Sophia and advocated establishing a quota system to alleviate pressure from the union's border nations.

9.3.3 USA

The United States of America is the most developed, industrialized, and strong country in the world. The United States of America is located almost in the middle of North America and

consists of 50 states, 48 of which are on the continent. Alaska, the country's 49th state, is located away from the continent. It is the country's largest state and is located on a peninsula in far northwestern North America. The 50th state is the Hawaiian Islands, which are located in the Pacific Ocean approximately 3400 kilometers from San Francisco.

The US mainland ranges from 24° 30' to 49° north latitude and 67° to 125° west longitude. Alaska, isolated from the mainland, is located between 55° to 72° north latitude and 130° to 167° west longitude. Alaska is located to the south and west. Canada is located to the north of the United States, surrounded by the Pacific and Antarctic Oceans and with a coastline that is approximately 10,700 kilometers long. The western border of Canada and the United States is 49° north latitude (west of Lake Superior), while the eastern border is the Great Lakes and the St. Lawrence River.

To the south of the United States is Mexico. Overall Geography of the United States The total size is 9826.63 thousand square kilometers. Thus, it is the world's fourth largest country by area, trailing only Russia, Canada, and China. The population of the United States of America is around 31.8 crores, with a population density of 33 per square kilometer.

After World War II, the United States was one of the world's two superpowers (bipolar powers), with the Soviet Union. Following the disintegration of the Soviet Union in 1991, the United States was unquestionably the world's first superpower. However, this country was a British colony in the early half of the eighteenth century. The American Revolution, which ran from 1775 to 1783, was a freedom and equality-based independence movement. By 1785, 13 British colonies had been established in North America, primarily along the Atlantic coast. 90% of the people living in these villages were English, with the remaining 10% being Dutch, German, French, or Portuguese. These American settlements were formed around 1775. Significant development has been made in agriculture, trade, the fishing sector, shipbuilding, and other areas.

According to the Paris Agreement (September 1783), the 13 American colonies gained independence as a result of the American Revolution. The freshly drafted United States Constitution went into effect in June 1788, and America's republic was constituted in accordance with it. The new American government was established in March 1789, with George Washington serving as the country's first President. Later, the American government stretched the country westward, subjugating all states up to the Pacific Ocean coast and founding the United States.

Trade of North America

North American trading trends provide notable disparities. Canada, despite its tiny population, vast resources, and great productivity, has the lowest domestic consumption and is more reliant on international trade than any other wealthy country on the continent. The United

States, on the other hand, with a massive internal market and the world's largest per capita consumption of goods, relies primarily on internal commerce, while external trade has increased significantly since World War II and currently accounts for roughly one-fourth of global trade. In contrast, Mexico and Central America continue to have extensive areas where people live on subsistence and generate little more than commodities for local trade. Certain metals, oils, and tropical crops, on the other hand, have seen substantial growth in production for export.

In 1992, Canada, Mexico, and the United States signed the North American Free Trade Agreement (NAFTA), a contentious trade treaty that gradually reduced most tariffs and other trade obstacles on goods and services moving between the three nations. The treaty effectively established a free-trade bloc between North America's three largest countries.

Internal trade of the united entities is huge, frequently outpacing that of sovereign entities on other continents. It was long dominated by New England's need for fuel, cotton and wool, leather, wood products and metals; by the mid-Atlantic states' demand for coal, oil, natural gas, iron ore and other metals, and food products; by the Pittsburgh region's need for iron, copper, oil, and gas; by the lower Great Lakes-Lake Michigan area's need for coal, oil, gas, iron, pulp and paper, and wood; and by the Los Angeles-San Francisco region's demand for steel, aluminum, and cellulose products.

Traditionally, most of the rest of the United States has traded raw materials or semi-finished items with these major manufacturing locations, however there are important local industrial centers. Trade is concentrated in major urban areas such as New York City, Los Angeles, Chicago, Houston, and Philadelphia. These cities also handle a significant amount of American overseas trade. Cotton, tobacco, and wood products are among the commodities shipped from Southeastern ports, while wheat, maize, beef, and a variety of manufactured goods are shipped from mid-Atlantic ports.

Since the completion of the St. Lawrence Seaway, the major cities along the Great Lakes have been directly exporting the steel products, automobiles, aero planes, agricultural machinery, grains, and beef that the northern Midwest is famous for. New Orleans continues to export cotton, maize and other agricultural products from the extensive Mississippi hinterland, however oil and grain are now more important, whereas trade from Houston's huge port focuses on oil and chemical products. Los Angeles leads the West Coast in the sales of computer and electronic items, transportation equipment, aero planes, ships, motion pictures, and chemicals. Seattle is significant for its trade in computers and electronics, fish and forest products, and aircraft. American imports a wide range of products, including tropical fruits, woods, fibers, and vegetable extracts from Latin America, West Africa, and Southeast Asia; oil from Saudi Arabia, Mexico, Canada, Venezuela, and Colombia; tin from Peru, Indonesia, Bolivia, and Malaysia; wool primarily from New Zealand and Australia; and a diverse range of motor vehicles, machines, textiles, instruments, and books from Japan and Western Europe.

American commerce has a global distribution and impact: around one-third of its exports travel to Western Europe, another one-third to Mexico and Canada, and more than one-fifth to Japan, Southeast Asia, Australia, and New Zealand. Almost equally important has been the widespread influence of American foreign aid: while it initially aided American trade by requiring the use of domestically manufactured equipment, it has since become much more flexible, allowing countries to develop their own agriculture or industry in the most satisfactory way.

9.4 SUMMARY

OPEC is the organization in charge of regulating worldwide crude oil output and prices. This organization's internal structure is in charge of ensuring a reasonable petrol price. It also ensures that oil supplies do not deplete quickly. Hopefully, member nations will continue to contribute to OPEC's fair policies, which aim to bring about long-term reforms in our environment.

9.5 GLOSSARY

Gearing ratio- Net indebtedness divided by equity. Also known as the debt-to-equity ratio. This key figure is used to assess the financing structure.

Gross domestic product (GDP)- A measure of the economic performance of a national economy. It specifies the value of all goods and services produced within a country in a year.

Hedging- Securing a transaction against risks, such as fluctuations in exchange rates, by entering into an offsetting hedge transaction, typically in the form of a forward contract.

IAS- International Accounting Standards. Accounting standards developed and resolved by the IASB- IASB International Accounting Standards Board. Independent standardization committee.

IFRIC- International Financial Reporting Interpretations Committee (predecessor of the IFRS IC).

IFRS- International Financial Reporting Standards. The standards are developed and resolved by the IASB. In a broad sense, they also include the IAS, the interpretations of the IFRS IC or of the predecessor IFRIC as well as the former SIC.

IFRS IC- International Financial Reporting Standards Interpretations Committee.

Interest-rate swap- The exchange of interest payments between two parties. For example, this allows variable interest rates to be exchanged for fixed interest or vice versa.

Net indebtedness- The net amount of interest-bearing financial liabilities as recognized in the statement of financial position, the fair values of the derivative instruments, cash and cash

equivalents, as well as other interest-bearing investments. This figure is the basis for calculating key figures of the capital structure.

Operating assets-The assets less liabilities as reported in the statement of financial position, without recognizing the net indebtedness, sale of trade accounts receivable, deferred tax assets, income tax receivables and payables, as well as other financial assets and debts. Average operating assets are calculated as at the end of the quarterly periods and, according to our definition, correspond to the capital employed.

PPA- Purchase price allocation. The process of breaking down the purchase price and assigning the values to the identified assets, liabilities and contingent liabilities following a business combination. Subsequent adjustments to the opening statement of financial position – resulting from differences between the preliminary and final fair values at the date of initial consolidation – are also recognized as PPA.

Research and development expenses (net)- Research and development expenses (net) are defined as expenses for research and development less reimbursements and subsidies that we received in this context.

SIC- Standing Interpretations Committee (predecessor of the IFRIC).

Tax rate-The ratio of income tax expense to the earnings before tax. It can be used to estimate the company's tax burden.

Free cash flow- The sum of cash flow arising from operating activities and cash flow arising from investing activities. Also referred to as cash flow before financing activities. Free cash flow is used to assess financial performance

9.6 ANSWER TO CHECK YOUR PROGRESS

1. Where are OPEC'S headquarters?

- A. Dubai
- B. Vienna
- C. Riyadh
- D. Caracas

Answer: B

Which of the following countries is a founding?

- A. Oman
- B. Yemen

C. Syria

D. Venezuela

Answer: D

Which Emirate's OPEC membership was assumed by UAE?

A. Abu Dhabi

B. Dubai

C. Sharjah

D. Fujairah

Answer: A

When did Angola join OPEC?

A. 1975

B. 1986

C. 1997

D. 2007

Answer: D

When was European Economic Community formed?

A. 25 March 1957

B. 10 May 1945

C. 23 August 1949

D. 30 December 1955

Answer: A

Which of the following countries was not an original member of European Economic Community?

A. France

B. Luxembourg

C. Ireland

D. Belgium

Answer: C

How many countries were admitted to European Union in 2004?

A. 12

B.10

C.18

D. 23

Answer: B

What is the main currency of the United States?

A. Franc

B. Euro

C. Peso

D. Dollar

Answer: D

In which year did the United States enter World War First?

A. 1914

B.1918

C.1917

D. 1919

Answer: C

What are lakes Superior, Michigan, Erie and Ontario collectively know as?

A. Lake District

B. Arrow Lakes

C. Greater Lakes

D. Great Lakes

Answer: D

What is the central banking authority of the United States?

A. Bank of America

B. World Bank

C. Federal Reserve System

D. United statement

Answer: C

What is the Capital of the United States?

A. Boston

B. New-York city

C. Ottawa

D. Washington D.C.

Answer: D

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9.8 TERMINAL QUESTIONS

Long Answer type Questions

1. Discuss what you understand by continental trade
2. Review in detail the role of OPEC in continental trade
3. Issued on the actions of OPEC and EEC in continental trade
4. Explain the organization, nature and economic impact of EEC
5. Explain in detail OPEC and EEC organization

Short Answer Type Questions

1. Write a short note on OPEC
2. OPEC succeeded in its objectives. Do you agree?
3. What do you understand by European Economic Community (EEC)?
4. Write a short note on United States of America
5. Write a short note on EEC

UNIT-10 GLOBAL TRADING BLOCS

10.1 OBJECTIVES

10.2 INTRODUCTION

10.3 TRADE BLOCKS: MEANING AND CONCEPT

10.3.1 MAJOR REGIONAL TRADING BLOCS IN THE WORLD

10.4 SUMMARY

10.5 GLOSSARY

10.6 ANSWER TO CHECK YOUR PROGRESS

10.7 REFERENCES

10.8 TERMINAL QUESTIONS

10.1 OBJECTIVES

After having the detailed study of this unit you will be able to

- After having the detailed study of this unit you will be able to
- Understand the meaning and concept of Trade Blocs
- Understand the causes of Trade Blocs Formation
- Know about the effects of Trade Blocs
- Understand the types of Trade blocs

10.2 INTRODUCTION

Trading blocs have been rapidly increasing across the global economy. In 1992, the European unification (EU) completed the single market programme and launched a major monetary unification proposal. In 1994, the United States, Canada, and Mexico established the North American Free Trade Agreement (NAFTA). Even Japan, for many years the only industrialized country not a member of any regional accord, signed a trade agreement with Singapore in 2001. Overall, half of the regional trade agreements disclosed to the General Agreement Tariffs and Trade (GATT) have been negotiated in the last decade, with 133 totals since the establishment of the World Trade Organization (WTO). At the time of writing, several post-soviet states and former Eastern blocs members are lining up to join the EU; thirty-four countries in the Americas envision free trade "from Alaska to Tierra del Fuego"; the Association of Southeast Asian Nations (ASEAN) is preparing to establish a free trade zone; and Japan is looking into trade agreements with the Philippines, Thailand, Malaysia, and South Korea. This Trading Blocs examines how domestic politics have influenced the creation of trading blocs. Its basic thesis is that states form commercial blocs in response to political pressure from organized social interests. Understanding the establishment of commercial blocs and their external impacts, I contend, necessitates an analysis of the domestic system and the process of national policymaking.

10.3 TRADE BLOCKS: MEANING AND CONCEPT

A trade bloc is a 'preferential trade agreement' (PTA) between a group of nations that aims to considerably lower or eliminate trade obstacles within its members. A 'regional trade (or integration) pact' refers to a trading group made up of neighboring or geographically close countries. It is frequently referred to as a 'natural' trade blocs to emphasize that preferential trade occurs between countries with presumably cheap transportation costs or that deal extensively with one another. The two main characteristics of a trade blocs are: 1. It means the decrease or elimination of trade obstacles, and 2. This trade liberalization is discriminatory in the sense that it exclusively applies to trade blocs members, resulting in discrimination against

outside nations in their trading interactions with trade blocs members. There are a few regional integration agreements that emphasize cooperation above preferential market access. Trade blocs may also involve deeper kinds of integration, such as international competition, investment, labor and capital markets (including factor of production movements), monetary policy, and so on.

The integration of countries into trade blocs is frequently referred to as 'regionalism', regardless of whether the trade blocks is geographically based or not. The first waves of PTAs developed in the 1930s, fragmenting the world into trade blocs. This 'old (first) regionalism' also refers to regional initiatives involving developing countries in the 1950s and 1960s. Based on the goal of import-substitution industrialization, the rationale was that developing countries could benefit from economies of scale by sharing their trade preferences, lowering the cost of their individual import substitution strategy while the trade blocks became more self-sufficient. More successful experiences followed with the recent expansion of trade blocs, often known as 'new (second) regionalism', which mostly involve countries from the North and the South.

While there is a proliferation of PTAs around the world, with practically every country in Europe, Latin America, and Sub-Saharan Africa participating in at least one, not all PTAs are effective at liberalizing intra-bloc commerce. For example, based on the trend in intra-block trade intensities and shares, NAFTA, the US-Israel FTA, CACM, the Adecan Group, MERCOSUR, CEAO/UEMOA, and SACU appear to be effective trade blocs (though this does not imply efficiency), whereas ASEAN appears to be a rather ineffective grouping thus far.

WHAT ARE TRADING BLOCS?

Trading blocs are organizations or agreements between two or more countries with the goal of increasing commerce between them. Trade is supported or encouraged by the removal of trade obstacles, tariffs, and protectionist measures, albeit the nature and extent of these removals may vary depending on the agreement.

Advantages and Disadvantages of Trading Blocs

The creation of trade blocs and agreements has become increasingly widespread. They have an impact on global trade and have become a significant force in changing the international economy.

It is critical to discuss both the positive and bad effects on commerce and countries (members and non-members) around the world.

Advantages

Some main advantages of trading blocs are:

- **Promote free trade:** They help to improve and promote free trade. Free trade lowers commodity prices, expands export options, increases competition, and, most significantly, stimulates economic growth.
- **Improves governance and state of law:** Trading blocs aim to reduce international isolation while also improving the rule of law and governance in countries.
- **Increases investment:** Trading blocs, such as customs and economic unions, will enable members to profit from foreign direct investment (FDI). Increased FDI from enterprises and countries helps to create jobs and build infrastructure, while the government benefits from the taxes that these firms and individuals pay.
- **Increase in consumer surplus.** Trading blocs foster free trade, which boosts consumer surplus through lower prices and greater choice in goods and services.
- **Good international relations.** Trading blocs can assist develop positive international connections among its members? Smaller countries have a greater opportunity to participate in the global economy.

Disadvantages

Some main disadvantages of trading blocs are:

Trade diversion: Trading blocs distort global trade because countries trade with each other depending on whether they have an agreement, rather than if they are more efficient in manufacturing a specific sort of good. This decreases and distorts the competitive advantage that some countries may possess.

Loss of Sovereignty. This is especially true for economic unions, where countries no longer control their monetary and, to a lesser extent, fiscal instruments. This might be especially challenging during times of economic difficulty.

Greater interdependence. Trading blocs increase member countries' economic interdependence because they all rely on one another for some or all goods and services.

This problem can develop even outside of economic blocs because all countries have intimate ties to the trade cycles of other countries. It can be incredibly difficult for countries to exit a trading blocs. This can exacerbate a country's issues or raise tensions within the economic blocks.

Impact of trading blocs on developing countries

- Trading blocs can result in both winners and losers, which may not be desired. Smaller or underdeveloped countries typically bear the brunt of the losses.
- Trading agreements can have a negative influence on developing countries, whether or not they are members of the agreement.

- Non-members of trade agreements often have limited economic development as they are less likely to trade on comparable terms.
- Developing countries may struggle to compete with low-cost trading blocs due to economies of scale and technological innovation.
- Having more trading blocs leads to having fewer parties that need to negotiate with each other about trading agreements. If there is only a limited number of countries a developing country can trade with, this restricts the revenue they receive in exports and thus can use to fund development policies in the country.
- However, this is not always the case with developing countries as there is evidence to support the rapid economic development from free trade. This is specialty true for countries such as China and India.

10.3.1 MAJOR REGIONAL TRADING BLOCKS IN THE WORLD

Trade blocs are groups of countries that form advantageous trade arrangements among its members. It is a group of countries that share a common geographical boundary. There are four sorts of trading blocs: preferential trade areas, free trade zones, customs unions, and common markets. Here is a list of ten important regional trade blocs around the world.

- ASEAN
- APEC
- BRICS
- EU
- NAFTA
- CIS
- COMESA
- SAARC
- MERCOSUR
- IOR-ARC

The main benefits of trade blocs include increased FDI (Foreign Direct Investment) and the elimination of tariffs. Trade blocs are a sort of economic cooperation in which member countries within a region defend themselves from imports from other countries. Let's look at trade analysis for important regional trade blocs.

1. ASEAN – Association of South East Asian Nations

ASEAN was created on August 8, 1967, in Bangkok, Thailand. ASEAN comprises ten member countries, including Brunei, Malaysia, Singapore, Vietnam, Indonesia, Laos, Cambodia,

Thailand, the Philippines, and Myanmar. ASEAN's key goals are to boost economic growth, social advancement, and promote regional space and stability. It seeks to consolidate ASEAN into a single organization. Singapore has the largest trading market among ASEAN countries. According to the trade map, ASEAN exported items to the global market worth USD 890 billion and imported USD 846 billion in 2017. However, exports were USD 1183 billion and imports were USD 1105 billion in 2016.

Figure: 10.1 Asean Member Countries



Source: List of Members of ASEAN Organization (jagranjosh.com)

The AEC's member countries include Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. Singapore is the most impressive member state because of its robust economy. In terms of trade, ASEAN trade is 25% intra-regional, accounting for the majority of the bloc's total trade. In 2019, its external important partners are China, the United States, the European Union, Japan, and South Korea.

2. APEC - Asia Pacific Economic Cooperation

APEC also referred to its member economies, which account for around 60% of global GDP. Its mission is to promote economic growth, cooperation, commerce, and investment in the region. APEC has 21 member countries, including Brunei Darussalam, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, the Philippines, Russia, Singapore, Taiwan, Thailand, the United States, and Vietnam. In 2016, APEC exports totaled USD 8021 billion, with imports totaling USD 7997 billion. China and the United States are the largest trading partners.

Figure: 10.2 APEC Member Countries



Source: Asia-Pacific Economic Cooperation (APEC) - INSIGHTSIAS (insightsonindia.com)

3. BRICS

Figure 10.3 BRICS Member Countries



Source: New Kids on the BRICS: What the Bloc’s Expansion Means for the Global Geopolitical and Economic Landscape | USGI (usfunds.com)

BRICS is an organization of five national economies: Brazil, Russia, India, China, and South Africa. However, South Africa joined this organization in 2010, and it was formerly known as BRIC. In 2017, BRICS' total exports were USD 2902 billion, while imports were USD 2339 billion. China is the greatest trading partner among these countries, accounting for 70% of BRICS exports and 65% of BRICS imports.

4. EU – European Union

Figure: 10.4 EU Member Countries



Source: List of Members of European Union (jagranjosh.com)

The European Union (EU) is the world's largest trade blocks and second-largest economy. It is also the EU's greatest trading partner, accounting for 70% of imported goods in EFTA member countries. The European Economic Area Agreement came into force on January 1, 1994, to boost commercial and economic links with its neighboring non-EU countries. This agreement establishes the Internal Market, which combines the 27 EU member states and three EFTA nations, namely Iceland, Liechtenstein, and Norway, into a single market. This bloc is thus primarily concerned with preserving the four fundamental foundations of the single market: the free movement of products, people, services, and capital. By cooperating and accepting the EEA agreement, these three EFTA states can participate in the EU's single market and profit from free trade without having to apply for EU membership. They can also achieve equal rights and obligations within the Internal Market without having to adopt specific EU policies, such as common agriculture and fisheries policies, customs union, common trade policy, common foreign and security policy, justice and home affairs, harmonized taxation, and economic and monetary union. However, they are obligated to follow specific horizontal and flanking policies. The EEA comprises 30 member nations. Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech

Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden are the EU's 27 member nations. Switzerland, an EFTA member state, is not a member of the EEA but has bilateral agreements with the European Union.

5. NAFTA – North America Free Trade Agreement

NAFTA is the world's largest free trade area, with a combined population and GDP higher than 15 EU member countries. It was initially a bilateral trade agreement between Canada and the United States, but Mexico joined on January 1, 1994, forming a trilateral trading blocks in North America. This agreement seeks to abolish trade and investment barriers between member nations, foster a free trade environment, expand investment opportunities, and safeguard intellectual property rights. This agreement additionally provides coverage for services.

Figure 10.5: NAFTA Member Countries



Source: North American Free Trade Agreement (NAFTA) | Aim & Provisions (testbook.com)

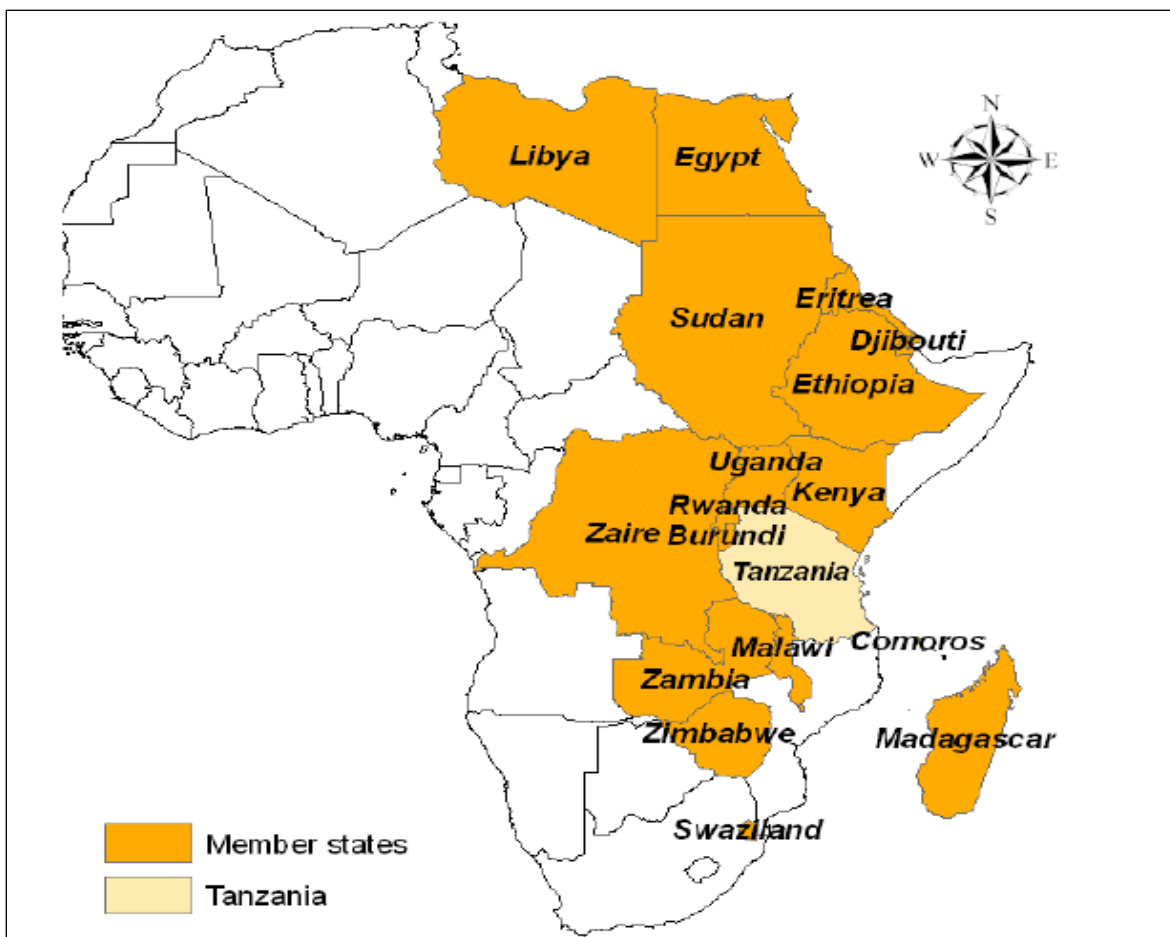
Excludes aviation, maritime, and basic telecommunications. The NAFTA also includes two supplements: the North American Agreement on Environmental Cooperation (NAAEC) and the North American Agreement on Labor Cooperation (NAALC), which address labor and environmental issues in member states. Among the three members, the United States is the largest commercial partner. All tariffs and quotas on US exports to Mexico and Canada were lifted on January 1, 2008, becoming Canada and Mexico the United States' first and third largest merchandise trading partners from 2008 to 2014.

6. CIS – Commonwealth of Independent States

The CIS group was created in 1991 and consists of 12 member countries: Azerbaijan, Armenia, Russia, Ukraine, Kazakhstan, Belarus, Turkmenistan, Uzbekistan, Georgia, Moldova, Kyrgyzstan, and Tajikistan. According to the CIS nations, their contribution to global exports was 2.6% in 2016, down from 3% in 2015. CIS countries provided 2% of global imports in both years.

7. COMESA – Common Market for Eastern and Southern Africa

Figure10. 6 COMESA Member Countries



Source: COMESA – Indian Economic Trade Organization (ieto. online)

COMESA is Africa's largest regional economic organization. It was constituted on December 8, 1994, to replace the earlier Preferential Trade Area (PTA) established in 1981. In this trading bloc, member countries collaborate to improve regional or worldwide trade, as well as their natural and human resources. This economic cooperation among COMESA member

states aims to enhance peace and security in the area. In light with this goal, the COMESA supports regional integration by establishing a free trade zone and initiating a customs union in 2009. This economic union includes of 21 nations in southern and eastern Africa—namely Burundi, Comoros, Democratic Republic of the Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, and Malawi. Mauritius, Rwanda, the Seychelles, Somalia, Sudan, Swaziland, Tunisia, Uganda, Zambia, and Zimbabwe. Because of its large number of member states and population of over 540 million people, COMESA is a key market for internal and external trade, accounting for USD 235 billion in global goods trade. Egypt is the bloc's biggest trader.

8. SAARC – South Asian Association for Regional Cooperation

Figure 10.7 SAARC Member Countries



Source: SAARC Countries, Functions, Objectives, Map, Full Form, Importance (studyiq.com)

As the South Asian region is the most densely populated region and one of the most fertile areas in the world, the SAARC plays an important role in helping South Asian countries work together in reaching their potential for prosperity. The SAARC, an organization of South Asian countries, was founded on 8 December 1985 by Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Afghanistan later joined in 2007. The member countries cooperate in the areas of human resource development and tourism; agriculture and rural development; environment, natural disasters and biotechnology; economics, trade, and finance;

social affairs; information and poverty alleviation; energy, transport, science and technology; and education, security and culture and others. In short, this regional organization is dedicated to developing economically, technologically, socially, and culturally with an emphasis on collective self-reliance. With this objective, the SAARC has established the South Asia Preferential Trading Agreement (SAPTA) in 1995 and the South Asia Free Trade Agreement (SAFTA) in 2016. The SAPTA aims to promote trade among the member countries, while the latter aims to encourage free trade of goods—excluding all services such as information technology—between the SAARC countries. Among the member states of this blocs, India is the largest trader.

9. MERCOSUR

Figure:10.8 MERCOSUR Member Countries

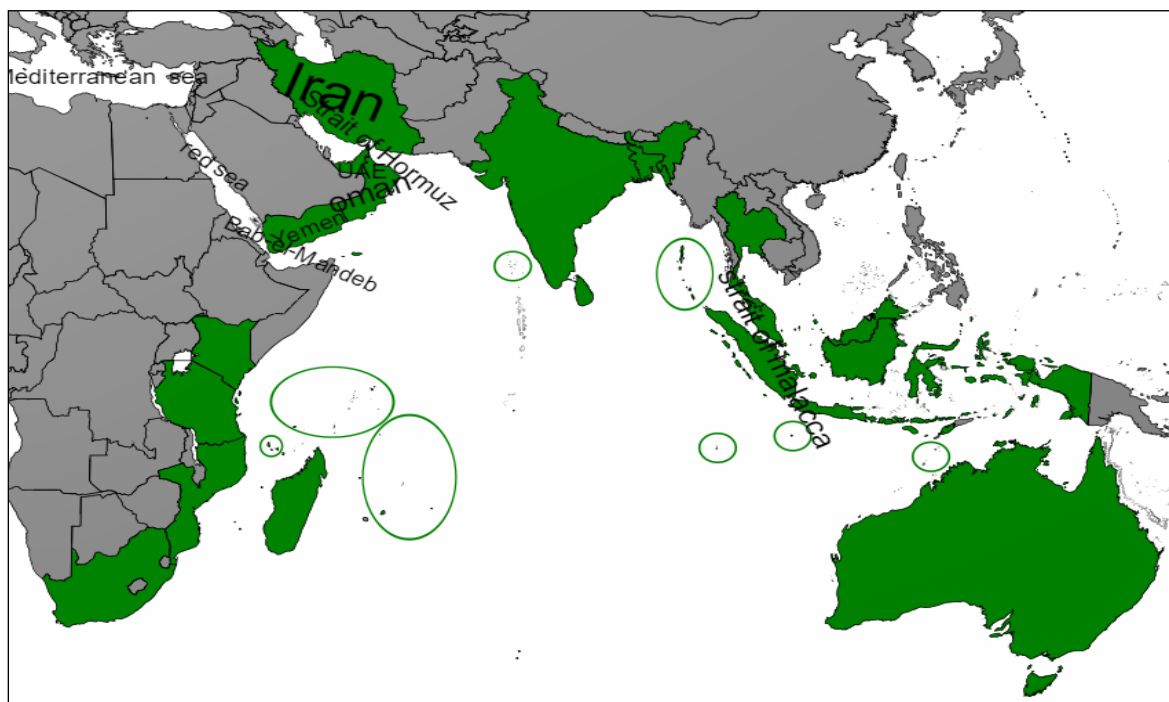


Source: BBC Mundo ECONOMÍA En Paraguay dudan del Mercosur

MERCOSUR is one of the world's fastest expanding trading blocs, with its four founding members accounting for 70% of South America's GNP. It is also one of the world's major economic blocs, with the fifth largest economy. The Treaty of Asuncion was signed on March 26, 1991, by Brazil, Argentina, Paraguay, and Uruguay. This blocs strives to accelerate long-term economic development through social justice, environmental protection, and poverty reduction. Aside from the four original countries, Venezuela and Bolivia joined the tariff union in 2006 and 2015, respectively. However, Venezuela's membership has been suspended since 2016 owing to a failure to adhere to MERCOSUR's democratic ideals. Chile, Colombia, Ecuador, Guyana, Peru, and Surinam are also associate members of this blocs; however they can only engage in preferential trade and cannot profit from tariffs. As of 2019, MERCOSUR's biggest external trading partners were China, the EU, the United States, Chile, and Mexico.

10. IOR-ARC–Indian Ocean Rim Association for Regional Cooperation

Figure10. 9: IOR-ARC Member Countries



Source: International Org. | Part 5 | Indian-Ocean Rim Association (IORA) - Civildaily

IOR-ARC has 21 member nations, including Australia, Bangladesh, Comoros, India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Mauritius, Mozambique, Oman, Seychelles, Somalia, Singapore, South Africa, Sri Lanka, Tanzania, Thailand, UAE, and Yemen. IOR ARC initially consisted of only seven countries, but it has now extended to include more countries. It seeks to encourage the long-term growth and development of its members. IOR-ARC exported USD 1875 billion and imported USD 1847 billion in 2016.

The list below includes 10 significant regional trading blocs in the global economy. These blocs are made up of countries that share a geographical boundary and have decided to work together to ensure regional economic prosperity. This list of the world's most notable regional trading blocs includes information on the bloc's importance in the global economy, as well as its foundations, goals, member countries, and key trade partners.

When we created this list, we sought to highlight the ten regional trading blocs with the most significant impact on global commerce and regional economic development.

10.4 SUMMARY

Various countries throughout the world have formed regional economic organizations to protect their interests. These organizations assist member countries by facilitating mutual import

and export. Free trade organizations impose no customs duties or taxes on their members. However, outside of the organization, they are allowed to impose customs restrictions on common-market countries. In contrast, the common market's member countries not only trade freely with one another, but also freely exchange production factors. Members of the economic organization accept uniform tax and currency policy. The members of the economic community constitute an organization that governs currency, customs, trade, agriculture industrial output, and even social policy. The European Commission (EC) is the most provides a good example.

Natural conditions make it impossible to manufacture and create all types of items in every country throughout the world. As a result, each country must rely on other countries to meet its needs, which encourages international trade. International trading has its advantages. There are some principles that govern its operation. Almost all items in international trade are imported and exported, resulting in a flourishing trade. In addition to being profitable, as the trade grows, labor rates begin to fall.

10.5 GLOSSARY

ASEAN- Association of Southeast Asian Nations

APEC- Asia-pacific economic co-operation.

BRICS- Brazil, Russia, India, China and South Africa.

EU- European Union.

NAFTA- North American free trade agreement.

CIS- Commonwealth of independent states.

COMESA- Common market for Eastern and Southern Africa.

SAARC- South Asian association for regional cooperation.

MERCOSUR- Mercado Comun Del Sur.

IOR-ARC- India Ocean Rim association for regional cooperation.

SAPTA- South Asia Preferential Trading Agreement.

EFTA- European Free Trade Association.

GATT- General Agreement Tariffs and Trade.

WTO - World Trade Organization.

FDI- Foreign Direct Investment

10.6 ANSWER TO CHECK YOUR PROGRESS

1. EU stands for

- A. Export Union
- B. European Union
- C. Exim Union
- D. Export Unit

Answer: B

2. The abbreviation SAARC stands for

- A. South America Association for regional Cooperation
- B. South African Association for regional Cooperation
- C. South Asian Association for regional Cooperation
- D. All the above

Answer: C

3. The full form of WTO is

- A. World tariff organization
- B. World's trade organization
- C. Western trade organization
- D. World transport organization

Answer: B

4. In international trade, full form of NAFTA is

- A. National American free trade agreement
- B. North American free trade agreement
- C. New ante tariff free trade agreement
- D. North Asian free trade agreement

Answer: B

5.was established by a multilateral treaty of 23 countries in 1947

- A. WTO
- B. UN
- C. GATT
- D. NAFTA

Answer: C

6. Foreign trade is an exchange of Capital, Goods and services across..... borders or territories.

- A. International
- B. National
- C. Both A & B
- D. None of these

Answer: A

7. International trade contributes and increases the world

- A. Population
- B. Inflation
- C. Economy
- D. Trade barriers

Answer: C

8. Free international trade maximizes world output through

- A. Countries reducing various taxes imposed
- B. Countries specializing in production of goods they are best suited for
- C. perfect competition between countries and other special regions
- D. The diluting the international business laws and conditions between countries

Answer: B

9. Trade among 2 nations can be helpful if the price ratios of products are:

- A. Equal
- B. Decreasing
- C. Undetermined
- D. Different

Answer: D

10. Which one of the following is international trade?

- A. Trade between regions
- B. Trade between countries
- C. Trade between provinces
- D. Both a and c

Answer: B

12. Trade between countries can indeed be useful if the price ratios of products are:

- A. Different
- B. Decreasing
- C. Undetermined
- D. Equal

Answer: A

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10.8 TERMINAL QUESTIONS

1. Write the names of major trade organizations of the world and describe any one of them in detail.
2. Describe major trade blocs of the world.
3. Give detailed description of ASEAN & IOR-ARC
4. Throw light on ‘SAARC’ organization by clarifying the meaning and concept of global trading blocs.
5. Discuss in the context of ‘BRICS’ and explain the advantages and disadvantages of the Global Trading Bloc.
6. Explain in brief European Union (EU).
7. Give detailed description of ‘MERCOSUR’.

UNIT: 11 IMPORTANCE CONCEPTS, APPROACHES & METHODS OF REGIONAL DEVELOPMENT

11.1 OBJECTIVES

11.2 INTRODUCTION

11.3 IMPORTANCE OF REGIONAL DEVELOPMENT

11.4 APPROACHES OF REGIONAL DEVELOPMENT

11.5 METHODS OF REGIONAL DEVELOPMENT

11.6 SUMMARY

11.7 GLOSSARY

11.8 ANSWER TO CHECK YOUR PROGRESS

11.9 REFERENCES

11.10 TERMINAL QUESTIONS

11.1 OBJECTIVES

After reading this unit, you will be able to:

- Understand the meaning, Importance and concepts of Regional Development.
- Learn about the Approaches of Regional Development in detail.
- Gain knowledge about the methods of Regional Development.

11.2 INTRODUCTION

Regional development refers to the intentional and strategic process of enhancing economic, social, and environmental well-being within a specific geographic area. This area can range from a small local community to a larger administrative region or even an entire country. The goal of regional development is to reduce disparities in economic opportunities, infrastructure, and quality of life among different regions, fostering balanced and sustainable growth.

Regional development involves various aspects, including investment in infrastructure, education, healthcare, and the promotion of local industries. Government policies, community involvement, and collaboration between public and private sectors are crucial in achieving effective regional development. Additionally, addressing environmental sustainability and cultural preservation are essential considerations in the planning and implementation of development initiatives.

Regional development is the label of the efforts to develop certain areas of a country, with development usually understood in the socioeconomic sense. Regional development is thus not only measured in incomes, the number of jobs, and demographic trends in a certain area, but it can also point to the more general dynamics such as innovation and creativity in the region in focus. The definition of the region in question has not always been explicit, but when it becomes explicit, it becomes clear how regional development is connected to the making of territorial states. In the Keynesian welfare state, regional development was associated with regional policies aiming to overcome uneven development between different regions of the territorial state. This means that regional development was, and in some contexts still is, seen as a marker

for the effort to overcome imbalances and unevenness within the territory of a state. In this more precise sense, regions are defined as being part of the whole about the state, and regional development is the agenda of regional policies to deal with a 'regional problem'. In the more Schumpeterian regimes, regional development has increasingly been seen as a process of innovation and entrepreneurship, aiming at growth in any region more than the explicit contribution to the solution of the particular 'regional problem'. Here, regional development is often associated with the growth and innovation of private business in a particular region, which in turn is rather loosely defined as the 'container' of socioeconomic activity.

Regional development can be associated with earlier traditions of regional geography, where regions were seen as the founding objects of geography and the main effort was to describe (i.e., to construct) regions as entities, which included noneconomic factors. Second, radical geography from the 1970s associated regional development with uneven development, where the features of the region were often seen as economic and highly structured if not even materially determined. This approach was followed in the 1980s by a more discrete understanding of regional development as processes of restructuring and changes in the spatial divisions of labour. Third, economic geography, with its main focus on the performance of firms, increasingly took over the field in the 1980s and especially the 1990s, also considering noneconomic factors in explaining regional development. The progress in the sense of more specialized studies of firm development and firm networks, however, went along with decreased interest in regional development in the broader sense of the life and working conditions of the inhabitants in an area. Meanwhile, economic geography's increasing focus on noneconomic factors opens new possibilities for understanding the broader complexities of the field of regional development.

However, a general problem with much of the use of noneconomic factors as an explanation for regional economic development is that these noneconomic factors are not analyzed in more detail. The most pertinent problem in this regard is the tendency to automatically make any noneconomic factor the attribute and generalized feature of the region in question. Another problem is the tendency to approach noneconomic factors as completely external, sort of outside resources, to the dynamics of regional development under study. There are, however, also human geographers who have contributed to the understanding of the making of regions in social, political, and cultural senses, where regional development becomes a field of

place and regional identity, regionalism and regionalization, and regional administration and governance, though these contributions do not always take regional development in the socioeconomic sense into consideration.

Regional development is about the geography of welfare and its evolution. It has played a central role in disciplines such as economic geography, regional economics, regional science, and economic growth theory. The concept is not static but refers to complex space–time dynamics of regions (or an interdependent set of regions). Changing regional welfare positions is often hard to measure, and in practice, we often use gross domestic product (GDP) per capita (or growth therein) as a statistical approximation. Sometimes alternative or complementary measures are also used, such as per capita consumption, poverty rates, unemployment rates, labour force participation rates, or access to public services. These indicators are more social and are often used in United Nations welfare comparisons. An example of a rather popular index in this framework is the Human Development Index which represents the welfare position of regions or nations on a 0–1 scale using quantifiable standardized social data (such as employment, life expectancy, or adult literacy).

11.3 IMPORTANCE OF REGIONAL DEVELOPMENT

The importance of regional development lies in its capacity to address regional disparities, foster sustainable growth, and enhance the overall well-being of communities within a specific geographic area. Balanced regional development contributes to economic stability, social equity, and environmental sustainability, creating resilient and thriving regions. One of the key reasons regional development is crucial is its role in reducing spatial inequalities, both in terms of economic opportunities and access to essential services. This, in turn, promotes social cohesion and inclusivity within and between regions.

Sustainable regional development is closely linked to environmental conservation and responsible resource management. By promoting eco-friendly practices and efficient land use planning, regional development initiatives can contribute to environmental sustainability, helping mitigate the impact of urbanization and industrialization on ecosystems.

Moreover, regional development plays a pivotal role in creating employment opportunities, attracting investments, and supporting local industries. This economic vitality

enhances the standard of living for residents and helps build robust and self-sufficient communities. Additionally, well-planned regional development can lead to improved infrastructure, better educational and healthcare facilities, and overall enhanced quality of life.

The importance of regional development is underscored by its far-reaching impact on economic, social, and environmental aspects within a specific geographic area. Here are several key points highlighting the significance of regional development:

1. **Economic Growth:** Regional development is instrumental in stimulating economic growth by fostering the establishment and expansion of industries, attracting investments, and creating job opportunities. This not only contributes to increased income levels but also promotes economic resilience and stability.
2. **Reducing Regional Disparities:** One of the primary goals of regional development is to address and mitigate disparities in economic opportunities, infrastructure, and access to services between different regions. By promoting balanced growth, it works towards creating a more equitable distribution of resources.
3. **Enhancing Quality of Life:** Regional development initiatives often lead to improved infrastructure, better healthcare facilities, and enhanced educational opportunities. This directly contributes to an improved quality of life for residents, providing them with access to essential services and amenities.
4. **Social Cohesion:** By fostering economic opportunities and addressing social inequalities, regional development plays a crucial role in promoting social cohesion within communities. This can lead to stronger community ties, reduced social tensions, and an overall more harmonious society.
5. **Environmental Sustainability:** Sustainable regional development considers the environmental impact of growth and aims to minimize negative effects on ecosystems. It encourages eco-friendly practices, responsible resource management, and the preservation of natural habitats.
6. **Innovation and Competitiveness:** Well-planned regional development can create an environment conducive to innovation and increased competitiveness. This is often

achieved through the development of research and technology hubs, fostering entrepreneurship, and investing in education and skills development.

7. **Attracting Investments:**Regions that demonstrate a commitment to development and sustainability often attract private and public investments. This influx of capital can further fuel economic activities, job creation, and the overall prosperity of the region.
8. **Cultural Preservation:** Regional development should also consider the preservation of cultural heritage. By recognizing and safeguarding unique cultural assets, development initiatives can contribute to maintaining a region's identity and fostering a sense of pride among its residents.
9. **Tourism and Recreation:**Developing regions with unique natural or cultural attractions can boost tourism, contributing significantly to the local economy. Tourism often brings in revenue, creates job opportunities, and promotes cultural exchange.
10. **Resilience to Shocks:** Regions that have diversified economies and robust infrastructure are better equipped to withstand economic downturns, natural disasters, or other unforeseen shocks. Regional development strategies often incorporate resilience-building measures to enhance the region's ability to recover from adverse events.

11.4 APPROACHES OF REGIONAL DEVELOPMENT

Regional development encompasses various approaches that aim to promote balanced growth and address disparities within specific geographic areas. These approaches consider economic, social, and environmental dimensions to create sustainable and resilient regions.

Cluster-Based Development:

Cluster-based development is a strategic approach in regional development that centres on the formation and growth of industrial clusters or agglomerations of related businesses within a specific geographic area. This approach, popularized by Michael Porter in the 1990s, emphasizes the idea that the co-location of interconnected industries creates synergies, encourages collaboration, and enhances the overall competitiveness of the region (Porter, 1990). Clusters can include a range of industries, from manufacturing and technology to services and research institutions.

The success of cluster-based development relies on the notion that proximity fosters innovation and knowledge exchange, leading to increased productivity and a competitive advantage for businesses within the cluster. Governments and regional development agencies often play a crucial role in supporting the growth of clusters through targeted policies, infrastructure investments, and the creation of a conducive business environment. This approach not only stimulates economic growth but also contributes to job creation, knowledge transfer, and the development of a specialized workforce.

Cluster-based development is particularly relevant in the context of globalization, as it allows regions to specialize in specific industries where they have a comparative advantage. The concept aligns with the idea that regions can achieve a competitive edge by focusing on their unique strengths and fostering collaboration among businesses, research institutions, and supporting infrastructure.

Bottom-Up Community Development:

Bottom-up community development is a participatory approach to regional development that empowers local communities to actively engage in the planning and implementation of initiatives to enhance their economic, social, and environmental well-being. Unlike top-down approaches that are driven by external agencies or governments, bottom-up development places emphasis on local knowledge, needs, and aspirations. This approach recognizes that communities are best positioned to identify their challenges and opportunities, fostering a sense of ownership and sustainability in the development process.

In bottom-up community development, residents, community organizations, and grassroots movements play a central role in decision-making. This participatory approach often involves community consultations, workshops, and collaborative projects that allow community members to voice their concerns, set priorities, and contribute to the design of development strategies (Friedmann and Douglass, 1978). The goal is to build social capital, strengthen community bonds, and create a shared vision for the future.

Infrastructure-Led Development:

Infrastructure-led development is a strategic approach in regional development that places a primary focus on the planned investment and improvement of essential physical and social infrastructure within a specific geographic area. This approach recognizes that a well-developed infrastructure is a fundamental prerequisite for economic growth, improved quality of life, and enhanced regional competitiveness. Infrastructure-led development involves targeted investments in areas such as transportation, communication, energy, water supply, and healthcare to create an enabling environment for sustainable development.

The rationale behind infrastructure-led development is that robust and efficient infrastructure networks facilitate the movement of goods and people, reduce transaction costs, and attract businesses and industries to the region (Aschauer, 1989). Improved infrastructure not only enhances connectivity within and beyond the region but also contributes to increased productivity and competitiveness. This approach is particularly crucial in regions where inadequate infrastructure has been a barrier to economic growth.

Governments and regional development agencies often play a pivotal role in implementing infrastructure-led development strategies. This may involve the construction of new roads, bridges, ports, airports, and public transportation systems, as well as investments in energy and digital infrastructure. The goal is to create a supportive environment for businesses to thrive, attract investments, and improve the overall living conditions of residents.

Inclusive Development:

Inclusive development is a comprehensive approach to regional development that prioritizes equitable access to opportunities, resources, and benefits for all members of a community, irrespective of their socio-economic background, gender, ethnicity, or other characteristics. The core principle is to ensure that the fruits of development are shared by the entire population, leaving no one behind. Inclusive development strategies recognize the diverse needs and aspirations of different groups within a region, striving to create an environment where everyone can participate in and contribute to the development process.

Key elements of inclusive development include addressing social and economic inequalities, promoting social cohesion, and enhancing the well-being of marginalized or vulnerable groups. This approach goes beyond traditional economic metrics and considers broader indicators of human development, such as education, healthcare, and social inclusion. Governments, development agencies, and community organizations play critical roles in formulating and implementing inclusive development policies.

Inclusive development approaches often involve targeted programs and initiatives to empower marginalized communities. This may include skill development programs, access to quality education and healthcare, and support for entrepreneurship in underserved areas. Moreover, inclusive development recognizes the importance of participatory decision-making processes, involving communities in planning and implementation to ensure that their unique needs and perspectives are considered.

Environmental Sustainability:

Environmental sustainability approaches in regional development emphasize the integration of ecological considerations into the planning and execution of development initiatives, aiming to create regions that thrive economically while minimizing negative environmental impacts. This approach recognizes the interconnectedness between human activities and the environment and seeks to strike a balance that ensures the preservation of natural resources and ecosystems for future generations.

Key components of environmental sustainability in regional development include reducing carbon footprints, promoting renewable energy sources, protecting biodiversity, and implementing sustainable land use practices. Strategies often involve adopting green technologies, enhancing energy efficiency, and incorporating principles of circular economy and waste reduction. Regional development plans aligned with environmental sustainability also focus on creating resilient ecosystems capable of adapting to climate change.

Governments, local authorities, and community stakeholders play vital roles in implementing environmental sustainability approaches. Policies may include regulations to limit pollution, incentives for eco-friendly practices, and the establishment of protected areas to

preserve biodiversity. Additionally, community engagement and education are crucial in promoting sustainable practices at the grassroots level.

Place-Based Development:

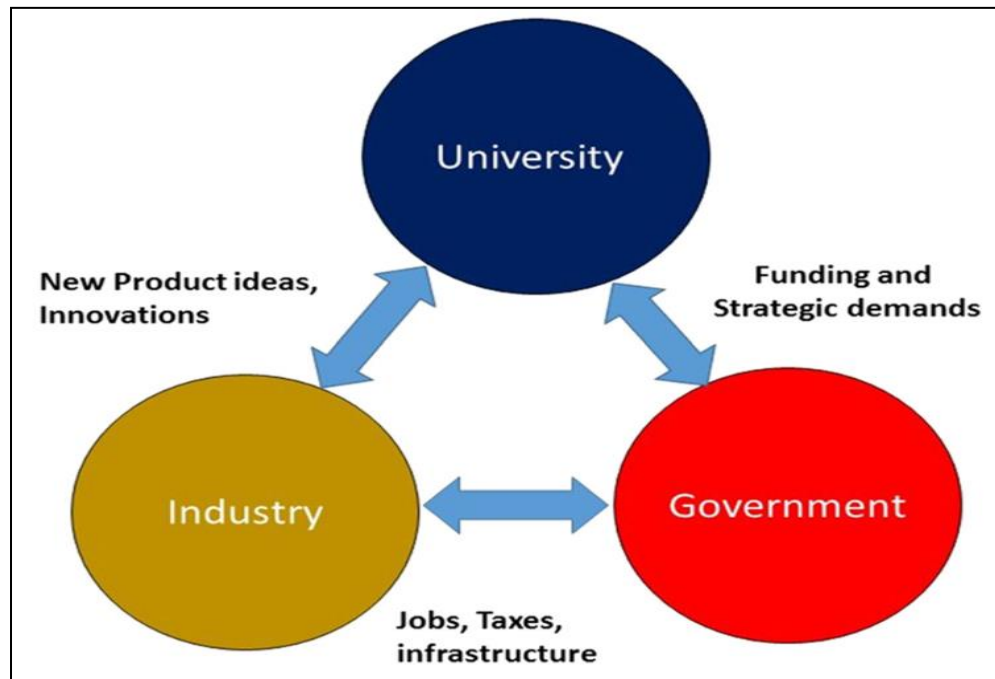
Place-based development is an approach in regional development that recognizes the unique characteristics, assets, and challenges of a specific geographic location, tailoring development strategies to the distinctive features of that place. Unlike generic or one-size-fits-all development models, place-based development emphasizes a deep understanding of the social, cultural, economic, and environmental context of a particular region. This approach acknowledges that each place has its own identity, history, and set of resources, and thus requires customized solutions that resonate with the local community.

Scholars like L. Rodwin (2013) argue that place-based development goes beyond economic considerations and embraces a holistic approach that considers social equity, cultural preservation, and environmental sustainability. This approach often involves initiatives to enhance the built environment, promote local culture and heritage, and create public spaces that reflect the identity of the region.

Triple Helix Model:

The Triple Helix Model is an innovative approach to regional development that emphasizes collaboration and interaction among three key entities: government, industry, and academia. Proposed by Henry Etzkowitz and Loet Leydesdorff in the 1990s, the model suggests that the dynamic interaction between these three spheres can lead to enhanced innovation, economic development, and knowledge creation. In the Triple Helix framework, government represents the public sector, industry represents the private sector, and academia represents the knowledge or research sector.

Figure: 11.1 The Triple Helix Model



Source: Source Google

In this approach, the three helices are interconnected and mutually reinforcing. Government institutions provide the regulatory frameworks, policies, and funding to support research and innovation. Industry, in turn, contributes with its market-driven demands and investments, while academia provides intellectual capital, research expertise, and human resources. This collaborative model promotes a continuous exchange of knowledge, skills, and resources, fostering innovation ecosystems within a region.

Resilience-Based Development:

Resilience-based development is an approach in regional development that focuses on enhancing a region's capacity to anticipate, respond to, recover from, and adapt to various shocks and stresses. These shocks can be economic downturns, natural disasters, environmental changes, or social disruptions. The key principle of resilience-based development is to create communities and systems that can withstand and recover from disturbances, maintaining functionality and well-being in the face of adversity.

Resilience-based development recognizes that vulnerabilities and risks are inherent in any region, and rather than simply reacting to crises, it aims to build proactive strategies and adaptive capacities. This approach involves a multi-faceted and interdisciplinary approach, considering economic, social, environmental, and institutional dimensions of resilience.

One aspect of resilience-based development is the diversification of economic activities to reduce dependence on a single sector. This can provide a buffer against economic shocks and contribute to long-term stability. Additionally, investments in infrastructure that can withstand natural disasters, such as resilient buildings and robust transportation networks, are crucial components of this approach.

Scholars like Berke and Campanella (2006) have highlighted the importance of planning for post-disaster resiliency, emphasizing that resilience-based development should be an integral part of the broader regional development strategy.

11.5 METHODS OF REGIONAL DEVELOPMENT

Methods of regional development encompass a diverse set of approaches and strategies aimed at fostering sustainable growth, improving the quality of life, and addressing disparities within specific geographic areas. Several key methods are commonly employed in regional development:

Investment in Infrastructure:

Investment in infrastructure is a crucial method in regional development that involves targeted spending on physical and organizational structures to enhance the economic, social, and environmental conditions within a specific geographic area. Infrastructure encompasses a broad range of facilities and systems, including transportation (roads, bridges, airports), communication (telecommunications networks), energy (power plants, electrical grids), water and sanitation, healthcare, and educational institutions. The rationale behind this method is that well-developed infrastructure not only supports the basic functioning of a region but also acts as a catalyst for economic growth and improved quality of life.

Strategic investments in infrastructure contribute to regional development in several ways. Improved transportation infrastructure, for instance, facilitates the movement of goods and people, reducing logistical costs and boosting trade and commerce. Robust communication infrastructure enhances connectivity, fostering innovation, collaboration, and access to information. Investments in energy infrastructure ensure a stable and reliable power supply, critical for industrial activities and overall economic productivity. Healthcare and educational infrastructure investments contribute to human capital development, improving the health and skills of the workforce.

Governments and regional development agencies typically play a central role in planning and financing infrastructure projects. Public-private partnerships (PPPs) are also common, involving collaboration between government entities and private investors to fund and implement projects. Sustainable infrastructure development considers environmental impacts, energy efficiency, and resilience to climate change, aligning with broader goals of environmental sustainability.

Human Capital Development:

Human capital development is a fundamental method in regional development that focuses on enhancing the knowledge, skills, and capabilities of the workforce within a specific geographic area. Recognizing that people are central to economic growth and innovation, this approach emphasizes investments in education, training, healthcare, and other measures to empower individuals and communities. The goal is to create a skilled and adaptable workforce that can contribute to economic development and compete in a knowledge-driven global economy.

Education is a key component of human capital development. Investments in primary, secondary, and tertiary education provide individuals with the necessary knowledge and skills for employment and entrepreneurship. Vocational and technical training programs can also play a crucial role in aligning the workforce with the needs of specific industries within a region.

Healthcare is another essential aspect of human capital development. Access to quality healthcare services ensures a healthy and productive workforce. Preventive healthcare measures,

vaccination programs, and healthcare infrastructure contribute to the well-being of the population, reducing absenteeism and promoting overall productivity.

Diversification of Economic Activities:

Diversification of economic activities is a strategic method in regional development that seeks to broaden the range of industries and sectors operating within a specific geographic area. This approach aims to reduce dependence on a single economic sector, making the region more resilient to economic fluctuations and external shocks. By fostering a diverse economic base, regions can create a more stable and sustainable environment for growth and development.

One key rationale behind the diversification of economic activities is to mitigate the risks associated with an overreliance on a single industry. Regions heavily dependent on a particular sector, such as manufacturing, agriculture, or natural resource extraction, may face challenges when that sector experiences downturns or changes in market conditions. Diversification helps to spread risk, making the regional economy less vulnerable to the cyclical nature of individual industries.

Cultural and Creative Industries:

Cultural and creative industries (CCIs) represent a distinctive method in regional development, leveraging the cultural assets of a specific geographic area to foster economic growth, social vitality, and innovation. This approach recognizes the economic potential of cultural expression, artistic creation, and creative endeavours, encompassing fields such as visual arts, performing arts, design, literature, film, music, and digital media. By strategically investing in and promoting these sectors, regions can not only preserve and celebrate their cultural identity but also stimulate economic development.

One of the primary objectives of incorporating cultural and creative industries into regional development strategies is job creation. These industries often require a skilled and diverse workforce, contributing to employment opportunities and the development of a dynamic labour market. Furthermore, CCIs can act as catalysts for urban regeneration and the revitalization of underutilized spaces, transforming areas into cultural hubs that attract residents and tourists alike.

Spatial Planning:

Spatial planning is a critical method in regional development that involves the systematic organization and allocation of land use, infrastructure, and resources within a specific geographic area. This approach aims to create a balanced and sustainable spatial structure that enhances economic efficiency, environmental sustainability, and overall quality of life for residents. Spatial planning takes into account various factors, including population growth, economic activities, environmental considerations, and social needs.

One key aspect of spatial planning is land-use management. Through zoning regulations, land is allocated for residential, commercial, industrial, and recreational purposes, preventing incompatible land uses and optimizing the use of available space. This helps create well-organized and functional urban and rural spaces, reducing congestion and promoting efficient transportation systems.

Environmental considerations are paramount in spatial planning to ensure sustainable development. This involves preserving green spaces, protecting natural habitats, and mitigating the impact of human activities on the environment. Sustainable spatial planning promotes energy efficiency, waste reduction, and the use of renewable resources, contributing to the long-term resilience and ecological health of the region.

Governments, urban planners, and regional development agencies play essential roles in implementing spatial planning methods. The development of master plans, zoning regulations, and strategic development frameworks guides the physical growth of a region. Additionally, advancements in technology, such as Geographic Information Systems (GIS), aid in data-driven decision-making and scenario analysis for effective spatial planning.

11.6 SUMMARY

Regional development is a multidimensional and dynamic process that focuses on enhancing the economic, social, and environmental well-being of specific geographic areas. It involves strategic planning and the implementation of various methods to address the unique challenges and opportunities present within a region. Economic diversification, infrastructure investment, human capital development, and the promotion of cultural and creative industries are

among the key strategies employed in regional development. The overarching goal is to create resilient, sustainable, and inclusive communities where residents can enjoy an improved quality of life, businesses can thrive, and the environment is preserved for future generations. Effective regional development requires collaboration between governments, local communities, private enterprises, and other stakeholders to ensure that strategies align with the specific needs and aspirations of the region.

Successful regional development is marked by a holistic approach that considers the interplay between economic growth, social equity, and environmental sustainability. By integrating diverse methods such as spatial planning, public-private partnerships, and resilience-based development, regions can navigate challenges, capitalize on their unique strengths, and foster a conducive environment for innovation and prosperity. The process involves ongoing engagement with local communities, transparent governance, and a commitment to long-term planning, ensuring that the benefits of development are equitably distributed and that the region evolves into a vibrant, sustainable, and resilient entity.

11.7 ANSWER TO CHECK YOUR PROGRESS

1. What does the term "resilience" refer to in regional development?

- A. Economic growth
- B. Ability to anticipate, adapt, and recover from shocks
- C. Population density
- D. Cultural diversity

Answer: B

2. Which approach prioritizes social equity and ensuring development benefits all segments of the population?

- A. Cluster-Based Development
- B. Inclusive Development

- C. Place-Based Development
- D. Smart Growth

Answer: B

3. What is the primary focus of spatial planning in regional development?

- A. Economic diversification
- B. Environmental conservation
- C. Land-use organization and resource allocation
- D. Cultural preservation

Answer: C

4. What does the Triple Helix Model involve in regional development?

- A. Collaboration between three regions
- B. Collaboration between government, industry, and academia
- C. Development of three industries
- D. Investment in three sectors

Answer: B

5. Which concept involves balancing economic growth with environmental conservation and social well-being?

- A. Sustainability
- B. Resilience
- C. Inclusivity
- D. Smart Growth

Answer: A

6. What is the emphasis of the Cluster-Based Development approach?

- A. Social Equity
- B. Innovation, collaboration, and competitiveness in industry clusters
- C. Infrastructure development
- D. Cultural preservation

Answer: B

7. Which approach tailors development strategies to the unique characteristics of a specific region?

- A. Inclusive Development
- B. Place-Based Development
- C. Cluster-Based Development
- D. Triple Helix Model

Answer: B

8. What is the primary goal of Human Capital Development in regional development?

- A. Preservation of cultural heritage
- B. Financial investment in infrastructure
- C. Enhancement of the knowledge and skills of the workforce
- D. Environmental conservation

Answer: C

11.8 GLOSSARY

- **Resilience:** The ability of a region to anticipate, adapt to, and recover from shocks and stresses, ensuring long-term sustainability.
- **Inclusivity:** The consideration and incorporation of diverse perspectives and the equitable distribution of benefits in regional development.
- **Cluster-Based Development:** Fostering the growth of industry clusters or agglomerations to stimulate innovation, collaboration, and competitiveness.
- **Inclusive Development:** Prioritizing social equity and ensuring that development benefits all segments of the population, leaving no one behind.
- **Place-Based Development:** Tailoring development strategies to the unique characteristics and assets of a specific region to enhance community identity.
- **Spatial Planning:** Systematic organization of land use, infrastructure, and resources to create a balanced and sustainable spatial structure within a region.
- **Human Capital Development:** Investing in education, training, and healthcare to enhance the knowledge and skills of the workforce.
- **Cultural and Creative Industries:** Leveraging cultural assets for economic development, emphasizing sectors such as arts, design, and media.
- **Triple Helix Model:** Collaborative model involving government, industry, and academia to drive innovation, economic development, and knowledge creation.
- **Environmental Sustainability:** Integration of ecological considerations into development planning to ensure long-term environmental health.

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11.10 TERMINAL QUESTIONS

1. Why is the concept of "resilience" important in the context of regional development, and how does it contribute to the overall sustainability of a region?
2. Discuss the key features and benefits of the "Inclusive Development" approach. How does it ensure equitable growth within a region?
3. Explain the role of "Spatial Planning" in regional development. How does it contribute to the organization and sustainable use of land and resources?
4. How does the "Triple Helix Model" foster collaboration between government, industry, and academia? Discuss its significance in driving innovation and economic development within a region.
5. Define the concept of "Sustainability" in regional development. How can sustainable practices be integrated into various aspects of development to ensure long-term environmental, economic, and social well-being?
6. Explore the goals and strategies associated with "Cluster-Based Development." How does this approach stimulate innovation, collaboration, and competitiveness within specific industry clusters?

7. Elaborate on the principles and implementation of the "Place-Based Development" approach. How does it leverage the unique characteristics of a region for sustainable growth and community identity?
8. Examine the significance of "Human Capital Development" in regional growth. How do investments in education, training, and healthcare contribute to building a skilled and adaptable workforce?

**UNIT-12 PLANNING REGIONS OF INDIA AND
UTTARAKHAND**

12.1 OBJECTIVES

12.2 INTRODUCTION

12.3 REGION AND REGIONAL PLANNING

12.4 SUMMARY

12.5 GLOSSARY

12.6 ANSWER TO CHECK YOUR PROGRESS

12.7 REFERENCES

12.8 TERMINAL QUESTIONS

12.1 OBJECTIVES

After having the detailed study of this unit you will be able to:

- Understand Need for region and regional planning.
- Understand the concept of geography and planning

12.2 INTRODUCTION

After India achieved independence, regional development became a focus beginning with the first five-year plan. Specific programmes for regional development were initiated in the 1970s, and India achieved tremendous headway in this field throughout the 1980s. Currently, India is seeing regional development. The study of planning is also crucial since, even after six decades of independence, the country still has various forms of regional imbalances. In such a setting, geographical studies on regional development and planning in India are timely as well as elaborate.

The concept of region began in the 5th century B.C., when Herodotus attempted to split the earth into regions. Modern regional consciousness and thinking in terms of areas and regions rather than places and points emerged only at the beginning of this century. Dela Blache's "Geography of France" (1903) is a seminal book in the field of economic regionalization and development. Prior to the second decade of the twentieth century, the concept of a "true region" founded on the ideology of "environmental determinism" gained popularity in the West. Fortunately, the concept of regional delimitation was founded on a determinist interpretation of a region's characteristics. Kurbar, Semenov-Tyanstanskiy, and others elaborated on the same concept.

The deterministic philosophy, which emphasizes disparities in the level and pattern of growth in terms of variations in the nature of physical limits, progressively gave way to subjective notions as a result of technological and institutional changes. This resulted in arbitrary regionalization exercises, and in response, neo-determinism emerged. The philosophy of neo-determinism emphasizes that regionalization should be understood as a way of uncovering objective regions irrespective of a researcher's mind. It is thought to be possible to eliminate subjectivity and completely automate the regionalization process using impartial data and proper statistical techniques. The fallacy of such a viewpoint became apparent when Kolosovskiy exhibited key aims in contrast to Go plan's 13-region strategy. The discovery of objective regions is, in fact, merely one component of a larger process of region alienation. Following World War II, a remarkable and dramatic development in regional consciousness resulted in the holding of regionalization conferences, the establishment of permanent regionalization bodies, and the printing of a wealth of literature in the shape of books, essays, and bulletins. This led to the use of more advanced techniques for recognizing different types of regions.

Regional planning has evolved as a distinct profession in recent years, but the concept of region remains a field of study that has a long way to go before it can be effectively used for planning areas have been considered differently by scholars from diverse disciplines, and while doing so, these researchers tended to conceptualize areas in terms of concepts related to their respective studies. Looking at what samples of thinkers has to say about this variance in thinking and conceptualization of areas will help you understand it.

12.3 REGION AND REGIONAL PLANNING

According to Jeorg a region is "any portion of the earth's surface where physical conditions as together constituting a definite portion of the earth's surface" and are homogeneous. The term "region" is used by Aronvici to describe "a geographical area or areas which a given civilization standard of a people seems to require for the fulfillment of its aspirations through material resources". Herbertson describes a region as "a complex of land, water, air, plant, animal, and man, viewed in their spatial relationship."

Regardless of which geographical notion is being discussed in general, a definite physical border must be defined in each situation. In practice, the entire regionalization challenge boils down to defining the region's boundaries. The task of determining boundaries in a given circumstance is known as regional delineation.

Regional planning covers a much greater area than city planning; while a region may include a number of cities, the rural area remains at the heart of the planning process. Along with rural areas, numerous lower-level towns, as well as villages being transformed into towns, contribute to areas for which regional plans are developed. Regional planning can span state lines.

Need of regional planning

Integrating a much wider areas for overall growth of "region" in the purpose served by regional planning, planning for integration of rural areas and the overall balanced development of the region. Fulfilling the needs of a backward region and providing higher order services for relatively developed areas. Strategies are formulated carefully to keep the goods and resources available to all the places as per their requirements.

Regional planning also helps to prevent conflicts and resource competitiveness among a region's cities. Developing small towns or satellite towns relieves stress in bigger communities, increasing efficiency.

Regional plans take into account economic, geographical, and environmental goals while attempting to address national-level concerns. Integrated development and careful study of functional links are crucial to achieving the desired growth.

Unlike city planning where land use plans are prepared regional planning lays emphasis on policy for the region. Policies are then elaborated and objectives are formed which differ from area to area within the region.

Regional plans are required as cities begin to impact growth even in remote areas, which may result in underutilization and waste of resources if not well planned.

Policies have a greater and longer-term impact on the region's overall growth and may conflict with the land use plan or plan prepared for a specific city; generally, a new body is formed to coordinate all of the individual departments working in the region, particularly with development authorities and local bodies.

The regional planning board or authority may also allocate cash for certain activities and locations. Government action, such as introducing a new plan or policy for an area, can also increase growth prospects and support the policy developed by the regional board.

Reduced disparities benefit both directly and indirectly by lowering forced migration, journey lengths, providing better and more work prospects in adjacent locations, and ensuring the availability of necessary services rather than allowing them to emerge arbitrarily. Special economic zones (SEZs) are also formed to boost regional growth and attract investment.

Role of Regional Planning:

- In the name of rapid progress, people produced such changes at the local, regional, provincial, national, and worldwide levels that the balance of the environment and our ecology were disrupted.
- Regional planning refers to the large-scale effort to create effective regional planning in order to alleviate social and economic inequalities and prevent ecological imbalance.
- The pace of development varies every country.
- Countries that are now behind the curve are continuously attempting to accelerate their development through strategic planning.
- Regional planning is vital because it ensures that existing resources are used efficiently.
- Regional planning policies are designed to prevent resource misuse.

Geography and Regional Planning

Much of the second part of the twentieth century has been marked by rapid urban and suburban development. As a result, urban geography and urban and regional planning have emerged as important branches of geography, with geographers making considerable

contributions to the larger planning discipline. Planners will be in high demand as cities become more crowded and inhabited in the twenty-first century.

Regional planning focuses on the spatial organization of activities and land use activities, as well as infrastructure, over a greater region of land than a single city or town. Regional planning is a subfield of urban planning that addresses land use patterns on a larger scale. Regional planning also investigates the processes and causes that influence change across areas, such as population growth and distribution, ethnic composition, political movements, and industrial patterns. Regional planners concentrate on both the unique or distinguishing qualities of each region and the parallels that exist between geographical education and training, which foster a broad awareness of society's various regions.

Complex use of urban and rural land is required for successful planning and to provide potential answers to problems emerging from conflicting land uses within regions. GIS, mapping, and remote sensing are strong technologies that help geographers plan for the future.

Ideally, planners may create master plans that improve the economies and social fabric of neighborhoods, towns, cities, and regions. They work to design communities that are both efficient and appealing to live and work in by taking into account zoning restrictions; traffic flows, building density, hydrology, population distribution, and recreational demands. To develop these skills, planners research population geography, transportation, social services, utilities, and solid waste disposal systems.

Some planners specialize nearly exclusively in transportation planning. Traffic congestion, as well as the noise and air pollution it causes, has become a big issue in many cities, particularly since residents have resisted most public transit plans, preferring private automobiles as their mode of transportation. This puts a significant burden on city street networks and creates a demand for skilled planners. Geographers, with their advanced spatial analysis skills, can help with this planning endeavor.

Concept of Planning Region

A planning region is a portion of territory (space) across which economic rules apply. The term 'planning' in this sense refers to making a choice to implement it in order to achieve economic development. Planning areas can be administrative or political regions, such as the state, district, or block, because they are better at managing and collecting statistical data. As a result, the entire country serves as a planning region for national plans, states as planning regions for state plans, and districts or blocks as planning regions for micro-regional plans.

To ensure proper implementation and realization of plan objectives, a planning region should have a generally uniform economic, zoographical, and socio-cultural structure. It should be large enough to hold a variety of resources, ensuring its economic viability. It should also be

internally consistent and geographically a contagious area unit. Its resource endowment should be such that a suitable degree of product combination consumption and exchange is possible. It should include certain nodal sites to regulate the flow. One of the most difficult difficulties in regional planning is determining the appropriate idea of region and demarcating planning regions. There are different types of regions in a country, and we can have as many sets of regions as the criteria used for regionalization. The notion of a planning region must be such that it may be used as an operational concept for defining planning regions and carrying out regional plans. Of the numerous types of regions, functional regions appear to be the best fit for regional planning. However, implementing this notion in developing countries has certain challenges. To begin, in such countries, there are few cores or metropolitan regions/places, and the majority of the territories are marginal or non-regional areas.

As a result, when implementing the notion of functional regions and delineating planning regions, special attention must be given to ensure that such areas are not overlooked. Second, underdeveloped economies have dual economies, with a few monetized sectors and market-oriented centers, while the remainder of the country is non-monetized and barter-based. While functional areas can be useful in regional planning, any search for functional regions is pointless in the later. Given the difficulties that impoverished countries face, planning regions must be defined in such a way that both developed and less developed areas are served. The size of such regions will have to be defined in terms of the problem to be addressed. The problem or difficulties of development will need to be addressed at the appropriate level. As a result, we will need to use regional planning at several spatial levels. This strategy will ensure that the full potential of even the smallest unit in the planning zone is realized, as well as that the regional variations in economic development are reduced. When it comes to planning regions, we have a hierarchy of different sorts of functional regions, macro regions, and micro-regions, and we can create a regional plan for each one. For example, we have first-order regions, which are macro-functional and correspond to states in India. Then there are second-order meso-functional regions, such as metropolitan or river valley regions. Third, inside these regions, there are third-order regions, or micro functional regions, which correspond to a state's administrative areas. Finally, we have the locality as the planning area, also known as the micro area, which is the fourth order region and includes a village, a group of villages, or a town.

In a country like India, four tiers of regional plans can be created in accordance with these hierarchical regions. They are:

- i. Macro-regional planning,
- ii. Meso-regional planning,
- iii. Micro-regional plans,

iv. Local planning.

The concept, choice, and demarcation of planning regions is a complicated topic with significant analytical and practical implications. The demarcation of regions must be regarded as an analytical variable. The planning authorities must decide on the notion of region, as well as the procedures and indices for demarcating regions. The following are some of the scholars' attempts to divide India into planning zones.

V. Nath (1965): V. Nath developed a model for Resource Development Regions and Divisions of India based on physical homogeneity, agricultural land usage, and cropping patterns. Although the regions transcend state boundaries, the division remains inside the state limit.

Thus, the entire country has been divided into 15 main and 48 sub regions. These major resource development regions include (1) Western Himalaya, (2) Eastern Himalaya, (3) Lower Ganga Plain, (4) Middle Ganga Plain, (5) L Upper Ganga Plain, (6) Trans-Ganga Plain, (7) Eastern Plateaus and Hills, (8) Central Plateaus and Hills, (9) Western Plateaus and Hills, (10) Southern Plateaus and Hills, (11) Eastern Coastal Plains and Hills, (12) Western Coastal Plains and Ghats, (13) Gujarat Plains and Hills, (14) Western Arid Region, and (15) Island Region.

L.S. Bhat and V.L.S. Prakasa Rao (1964): Bhat and Rao proposed a regional framework for resource development. Delineation was done with the help of qualitative maps of distribution of important natural resources. The major regions cut across the state boundaries. However, administrative convenience was not ignored. The scheme included 7 major and 51 minor regions. Seven major regions include: (1) South India, (2) Western India, (3) Eastern Central India, (4) North-Eastern India, (5) Middle Ganga Plain, (6) North-Western India, and (7) Northern India.

NATMO Professor S.P. Chatterji (1966) directed the National Atlas Organization, which advocated a four-tier economic zone model. In this model, macro regions are groups of states demarcated by characteristics such as population, political and historical considerations, economic links, agricultural output, and the complementary nature of natural resources.

P. Sen Gupta: Following the Soviet notion of economic regions and production specialisation, P. Sen Gupta (1968) proposed a framework of economic regions of varying order. She began by identifying the lowest-order planning units, which she subsequently grouped and regrouped to form planning regions at the meson and macro levels. Sen Gupta prioritized natural regions in her economic region plan, delineating them based on modality, production specialization, and power resource utilization. Her seven macro regions are: (1) North Eastern Region; (2) Eastern Region; (3) Northern Central Region; (4) Central Region; (5) North-Western Region; (6) Western Region; and (7) Southern Region. These are further broken down into 42 meson areas.

REGIONAL PLANNING

Regional planning provides a basic framework for development plans that address the fundamental and special demands of a geographical region based on regional distinctions. Explaining this, C.V. Narasimham “Regional planning provides an appropriate framework for the integration of national and local plans. This sort of comprehensive regional planning includes the planning of metropolitan development areas, natural resource areas, rural rehabilitation, and industrial localization”.

As a result, in regional planning, methods of maximizing the area and resources available in a state are investigated in order to fulfill overall state development goals. Y. N. Patrick defined regional planning as "an integrated plan for the use and transformation of a region's natural environment, the development of its productive forces, and the rational organization of territory."

In the words of Lewis and Mumford, "Territorial planning is the conscious direction and collective integration of all those activities, which are based on the use of the earth as space, resources and structure, or in this way it can be said that the systematic development of the region and its distribution to other countries." The objective of regional planning is to build more delicate relationships.

According to John Friedman, "Territorial planning is related to the organization of human activities in a larger area than an urban space, i.e. a city, or regional planning is the process of formulating social objectives in the organization of human activities within an urban space."

According to P. Sengupta, "Territorial planning is a well-planned effort to fully develop the natural and human resources of the state."

According to Radhakamal Mukherjee, "The objective of regional planning is to anticipate and organize for the future mutual arrangement of culture and territory in different ecological zones."

Thus, the main objective of regional planning is to make maximum use, conservation and development of human and resources for all the people of the state.

The subject matter and scope of regional planning can be divided into the following forms:

1. Planning of urban areas: Under this, importance is given to the physical, economic and social development of metropolitan areas in which the spatial structure of the city is kept in mind.
2. Planning of natural resources: This is the most important aspect of planning from the geographical point of view, because the development of human resources depends on the availability of natural resources, hence sustainable or sustainable development of natural resources is based on their planning.

The need for regional planning is as follows:

1. For proper utilization of local resources:

- Regional planning emphasizes equitable use of local resources.
- This can increase the economic development of the society at the local level.
- Regional planning focuses on appropriate and all-round development by eliminating regional imbalances.
- Therefore regional planning is needed in all countries.
- Through regional planning complex, resources can be distributed and used equally among all sections of the society.
- In the regional planning of the former Soviet Union, more emphasis has been given on the regional planning complex.

2. for solutions to increasing population and environmental problems-

- Due to increasing population in the world today, many problems are being seen which include poverty, hunger, unemployment, problem of good habitat, illiteracy, problem of pollution etc.
- Today every country is very worried about all these problems.
- Solution of all these problems is possible through regional planning.
- If the resources in any country are used in a proper or balanced manner then there is balance everywhere.
- Regional planning is necessary to maintain this balance.

3. To strengthen the geo-scientific organization-

- Due to being a colony for a long time, the organizations created for economic development after independence became weak.
- The resources of such countries were exploited in large quantities by foreign rulers only for the development of their country.

- Due to this, the amount of resources in the colonized countries started decreasing at a very fast pace and along with this, there was also imbalance in the economy.
- To avoid this imbalance, planned plans were made for agriculture, industry, transport, trade etc.
- Therefore, regional planning is very necessary and important here.

4. Balance between developed core and underdeveloped margin-

- Regional planning is also necessary in those countries where there is a problem of core-margin.
- There is a modern economy in the core and a very backward economy in the periphery.
- At the global level, Great Britain first emerged as the core.
- In comparison to Great Britain, its other colonies lagged behind, which are called margins?
- Friedman saw Britain-India as core and periphery.
- Due to core-margin problems, the problem of regional imbalance has arisen in the world, to overcome which there is a need for regional planning.
- The problem of core-periphery is not only global; this problem can also be seen between different states within any country. This problem exists even at the local level.

5. To improve and increase the quality of life-

- Human life quality is not the same in all areas.
- Many places are still extremely backward for hundreds of years.
- On the contrary, there are many places or areas where the quality of human life is extremely good.
- No matter which country a human being lives in, he always wants to keep his standard of living high and for this he always strives.
- He wants the development of his physical and mental abilities, fulfillment of food, clothing, education and health needs as well as a pollution-free environment.

6. For integration in various economic activities-

- Various sectors contribute to the economic development of any country like agriculture, trade, commerce etc.

- If there is a bad impact on any one of these sectors then its impact is visible on the entire economy.
- Therefore, integration of these sectors is necessary for economic development for which regional planning is necessary.

7. For balance between resources and ecology-

- Regional planning is also very important because due to indiscriminate use of resources the balance of the environment has been disturbed.
- In the race for rapid development, natural resources are being continuously destroyed.
- Pollution in the environment is also continuously increasing.
- Therefore, it is necessary to maintain natural resources and ecological balance and for equitable development.

8. For political stability-

- Regional planning also contributes to providing stability to the administrative system of the state.
- To maintain the unity and integrity of the country, it is necessary that all areas of the state (nation) develop and the feeling of rebellion and anger should not develop in any corner of the state.
- Regional planning plays an important role in maintaining religious and communal harmony and making government policies reach the common people.
- Development cannot be imagined in unstable political conditions.
- Therefore, regional planning is very important for the political stability of underdeveloped areas.

9. To provide a strong economic base to the state and to protect the country-

- Regional planning provides a strong economic base to the state.
- Through this, when the plans made for suitable and efficient infrastructure are completed, economic development happens rapidly.
- Regional planning suggests establishment of industrial activities only at suitable places.

- This protects industries during wartime.
- If all the industrial units are concentrated at one place then the enemy can destroy them by air targeting.
- Therefore, regional planning must be developed in the countries spread over wide areas – India, China, Russia, Canada, Brazil, Australia, United States of America etc.

Town and Country Planning Organization:

In 1968, the Town and Country designing Organization proposed a concept of designing areas based on economic viability, self-sufficiency, and ecological balance at the macro and meson levels. The concept aimed to include regional factors into economic development.

This strategy would supplement national macro planning with a regional policy component targeted at minimizing regional inequities in development. The macro regionalization intended to connect a collection of locations rich in one type of resource with areas with complementary resources or even resource deprived areas, so that the advantages of economic activity in the former may flow into the latter.

These planning regions cut across the State boundaries, but do not completely ignore the basic administrative units. The 13 macro- regions proposed under the scheme include: (1)South Peninsular (Kerala and Tamil Nadu), (2)Central Peninsular (Karnataka, Goa, Andhra Pradesh) (3) Western Peninsular (western Maharashtra coastal and interior districts), (4) Central Decca (eastern Maharashtra, central and southern Madhya Pradesh), (5) Eastern Peninsular (Orissa, Jharkhand north-eastern Andhra Pradesh and Chhatisgarh) (6) Gujarat (Gujarat), (7) Western Rajasthan, (8) Aravalli Region (Eastern Rajasthan and western Madhya Pradesh), (9) Jammu, Kashmir and Ladakh (10) Trans Indo-Gangetic Plains and Hills (Punjab Haryana, Himachal Pradesh, West Uttar Pradesh and Uttaranchal), (11) Ganga-Yamuna Plains (central and eastern Uttar Pradesh, and northern Madhya Pradesh), (12) Lower Ganga Plains (Bihar and West Bengal Plains), and (13) North-Eastern Region (Assam and north-eastern states including Sikkim and north Bengal).

Planning Regions of Uttarakhand

Uttarakhand, located in northern India, is a state recognized for its natural beauty, with the breathtaking Himalayas as its northern border. The planning regions inside the Uttarakhand Himalayas are critical to the development and preservation of this ecologically fragile area. These regions are defined based on physical, cultural, and administrative aspects, allowing for more targeted planning and sustainable development. The following are the unique

characteristics of Uttarakhand Himalayan planning regions, as well as their problems and developmental ambitions.

Planning regions are geographic areas designated for strategic urban and regional planning. They are often defined by government officials and serve as the foundation for comprehensive development programmes and land-use regulations. Planning regions include multiple municipalities or districts and seek to ensure effective resource allocation, balanced growth, and coordinated infrastructure development. These regions encourage collaboration among various stakeholders, including government agencies, local communities, and private-sector groups, to address common concerns and achieve sustainable and equitable development. Planning regions provide better spatial organization, infrastructure connectivity, and optimized land use to meet the population's socioeconomic demands.

KUMAUN REGION:

The Kumaon Region is located in the eastern section of Uttarakhand, and includes districts such as Nainital, Almora, Bageshwar, and Champawat. This region is well-known for its gorgeous hill stations, tranquil lakes, and historic temples. The planning activities here are aimed at increasing tourism, protecting the rich cultural heritage, and constructing sustainable infrastructure. Nainital, with its famous Naini Lake, is a popular tourist destination in Kumaon, with people from all over the world. The region also has various animal sanctuaries, notably the Jim Corbett National Park, which is well-known for its tiger conservation efforts.

The Kumaon Region faces several challenges, including striking a balance between tourism and environmental conservation, guaranteeing appropriate infrastructure to serve the expanding number of visitors, and developing job possibilities for local populations. Efforts are being undertaken to encourage eco-friendly tourism, organic farming, and increased connectivity via upgraded road networks.

GARHWAL REGION:

The Garhwal Region encompasses the western section of Uttarakhand, comprising districts like Haridwar, Dehradun, Tehri, and Chamoli. This region is known for its spiritual significance, with notable pilgrimage destinations such as Haridwar, Rishikesh, Kedar Nath, and Badrinath attracting millions of pilgrims each year. Garhwal's planning projects centre on sustainable tourism, infrastructure development, and the protection of the Ganges River, which has enormous religious and ecological value.

The region has issues such as uncontrolled urbanization, pollution, and preserving the fragile ecological balance. Efforts are underway to promote responsible tourism, build sustainable waste management systems, and protect the cultural and natural heritage. Rishikesh,

recognized as the Yoga Capital of the World, has become a wellness tourism hotspot, attracting visitors seeking spiritual renewal and yoga activities.

GREATER HIMALAYAS REGION:

The Greater Himalayas Region encompasses the districts of Uttarkashi, Pithoragarh and Rudra Prayag, located in the higher reaches of the state. This region is characterized by its rugged terrain, snow-capped peaks and glacial lakes. The planning initiatives in this region primarily focus on promoting adventure tourism, preserving biodiversity and mitigating the impacts of climate change.

Challenges in the Greater Himalayas Planning Region include ensuring the safety of trekkers and mountaineers, conserving fragile ecosystems and adapting to changing weather patterns. Efforts are underway to develop sustainable trekking routes, provide adequate safety measures and raise awareness about the importance of preserving the Himalayan ecology.

TARAI REGION:

The tarai region of Uttarakhand, located in the southern foothills of the Himalayas, has immense potential for development but faces considerable challenges. With fertile plains, rich water resources, and a diversified ecosystem, the region is ideal for agriculture, tourism, and industrial development.

However, various hurdles impede advancement in this area. Due to its proximity to the Himalayas, the region is vulnerable to natural calamities such as floods and landslides. Furthermore, inadequate infrastructure, such as roads, electricity, and healthcare facilities, impedes its growth. Unemployment and poverty are ongoing concerns that require attention, demanding the establishment of new work possibilities and measures to boost the local economy.

Despite these limitations, the Tarai region has tremendous growth opportunities. Modern farming practices, crop diversity, and the growth of agro-based companies can all benefit the agricultural sector. The region's natural beauty and biodiversity can be used to promote ecotourism, adventure tourism, and wildlife conservation, attracting visitors and creating revenue. Furthermore, developing industrial estates and investing in infrastructure can boost industry and trade, so promoting economic development.

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DELINEATION OF PLANNING REGIONS

Planning regions are specified sections of the country that are used for efficient and coordinated development planning. Delineating planning regions is an important part of regional planning in India. In India, planning regions are delineated using a variety of criteria, including topographical, economic, social, and administrative concerns. These criteria ensure that the planning regions are coherent and reflect the specific needs and features of the territories they cover.

GEOGRAPHICAL FACTORS

Geographical characteristics play an important role in defining planning regions. Considerations include landforms, climate, natural resources, and connection. Planning regions are frequently defined by geographical boundaries such as rivers, mountain ranges, or biological zones. Because of their particular characteristics and development constraints, the Himalayan region, coastal areas, and desert regions may be defined as distinct planning regions.

ECONOMIC FACTORS

Economic considerations are also important in determining planning regions. Economic indices such as GDP, industrial activity, agricultural productivity, and employment trends are used to identify regions that share economic features. For example, regions with strong agricultural output may be combined, whereas places with significant industrial activity may be divided into different planning regions. This enables focused and context-specific development planning.

SOCIAL FACTORS

Delineating planning regions takes into account social characteristics such as population makeup, cultural variety, and social infrastructure. Areas with comparable socioeconomic traits and developmental concerns are frequently grouped together. This guarantees that social development efforts like education, healthcare, and social welfare are customized to the region's unique needs.

ADMINISTRATIVE FACTORS

Administrative issues are critical in defining planning regions to promote effective governance and cooperation. Existing administrative boundaries, such as states or districts, could be used to define planning areas. However, administrative boundaries alone may not necessarily reflect regional development demands. In such instances, smaller administrative units can be combined or separated to form cohesive planning regions.

DEVELOPMENT IMBALANC

Another criterion for designating planning zones is to address regional development disparities. India is a huge and diverse country, with major regional differences. Planning regions might be established to alleviate these disparities and focus on underdeveloped or backward areas. This aids in allocating resources and development endeavors to areas that demand special attention.

INFRASTRUCTURE ANS CONNECTIVITY

Infrastructure and connectivity are critical factors in defining planning regions. The presence of transport networks such as roads, trains, and airports is thought to ensure the efficient movement of products, services, and people within and across regions. Well-connected regions can be combined to promote economic integration and development.

PARTCIPATION AND STAKEHOLDER CONSULTATION

The demarcation process involves public engagement and stakeholder interaction. Local communities, representatives, and specialists must be involved in the decision-making process to ensure that appropriate criteria are identified and that the areas' unique needs and desires are understood. This participatory approach guarantees that planning regions are inclusive and represent the goals of the local community.

12.4 SUMMARY

To summaries, the identification of planning regions in India requires a thorough examination of topographical, economic, social, and administrative variables. These factors aid in identifying cohesive regions with comparable development requirements and challenges. By taking these elements into account, planning regions can be developed to promote effective and coordinated development planning, resolve regional imbalances, and ensure long-term and inclusive growth across the country.

The Uttarakhand Himalayas planning zones are critical to balancing development and conservation in this ecologically vulnerable region. Each region has its own set of opportunities and difficulties, ranging from promoting sustainable tourism and infrastructure development to safeguarding cultural heritage and resolving environmental issues. Uttarakhand strives to achieve sustainable development by implementing well-thought-out planning measures that protect its natural resources and cultural heritage. It is critical to strike a delicate balance between the socioeconomic requirements of local residents and the preservation of the fragile Himalayan ecology.

12.5 GLOSSARY

Regional planning - is based on the use of natural resources of any region, natural environmental transformation, production powers and its judicious organization.

Planning area - This is the area in which economic decisions are implemented.

Resource Development Region - Such regions are demarcated on the basis of surface conditions, geological structure, climate, and soil, land use, cropping pattern, population density and availability of various resources.

Planning Commission – It is an advisory body of the Government of India, through which plans have been prepared on national and state star for the geo-economic and resource regions of India.

Regional disparity – The difference in development found in a region is called regional disparity.

12.6 ANSWER TO CHECK YOUR PROGRESS

1. V. Nath told how many main and how many sub-regions in India

A. 5,15

B. 7,48

C.15,48

D. Neither of the above

ANSWER: C

2. Bhatt and Prakash Raw divided India into how many major regions?

A. 5

B. 8

C. 7

D. 9

ANSWER: C

3. On what basis did NATMO delimit India into planning areas?

1. Economic relations, 2. Agricultural production, 3. Historical significance,

4. Natural resources

A. I, II, III

B. II, III

C. III, IV

D. I, II, III, IV

ANSWER: D

4. Who divided India into large planning regions following the Soviet Concept?

A. S.P. Chatarji

B. P. Sen Gupta

C. Prakaash Raw

D. Neither of the above

ANSWER: B

5. Who demarcated/delimited the Indian territories with the help of qualitative maps of distribution of natural resources?

A. V. Nath

B. Bhatt and Prakaash Raw

C. S. P. Chatarji

D. None of these

ANSWER: B

6. The Town and Country Planning Organization have classified India into how many large regions?

A. 15

B. 13

C. 18

D. 14

ANSWER: B

7. In which year did famine occur in Bihar state?

- A. 1966-67
- B. 1947-48
- C. 1989-90
- D. 1971-72

ANSWER: A

8. Electrification in rural areas can be done at better and cheaper rates by

- A. Coal energy
- B. Bio gas
- C. Nuclear Energy
- D. Solar energy

ANSWER: D

9. Where is the National Institute of Rural Development located?

- A. Patna
- B. Shimla
- C. Hyderabad
- D. New Delhi

ANSWER: C

10. Which of the following is the premier institute that provides training and conducts research on rural development in India?

- A. National Rural Institute
- B. National Rural Development Organization
- C. National Institute of Rural Development and Panchayati Raj

D. Rural Development Institute

ANSWER: C

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12.8 TERMINAL QUESTIONS

Long Questions

1. Divide India into planning regions and discuss them in detail.
2. Discuss the need for regional planning
3. Explain the concept of planning area
4. Explain in detail what you understand by regional planning.
5. Why is regional planning needed?

Short Questions

1. Explain the planning area of Uttarakhand
2. Throw light on the main factors of regional planning of Uttarakhand.
3. What do you understand by town and country planning organization?
4. Write a short note on regional planning

5. Write a note on region and regional planning



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