Allama Iqbal Open University AIOU ADC / ADB solved assignments no 1 Autumn 2025 Code 1428 Commercial Geography

Q.1 What are the fundamental concepts and modern approaches in economic geography? Explain their relevance with examples.

Fundamental Concepts in Economic Geography

Economic geography is the branch of geography that studies the distribution of economic activities, resources, industries, trade, and services across different regions of the world. It examines how location, physical environment, culture, infrastructure, and policies influence the development of economic systems. The fundamental concepts in economic geography serve as the foundation for understanding global and regional economies.

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1. Location and Spatial Distribution

Location is one of the most essential concepts in economic geography. The spatial distribution of resources,

industries, population, and markets influences economic activities. For instance, industries are often located near raw material sources to reduce transportation costs, while trade centers emerge where accessibility to different regions is possible.

Example: The textile industry in Faisalabad, Pakistan, developed due to its proximity to cotton-growing regions, while Karachi developed as a commercial hub due to its port location.

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2. Natural Resources and Resource Endowment

The availability of natural resources like minerals, oil, fertile land, forests, and water significantly shapes the economic activities of a region. Regions rich in resources often specialize in resource-based industries.

Example: Saudi Arabia's economy has been heavily dependent on oil reserves, while Pakistan's agricultural economy benefits from fertile lands in the Indus Basin.

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3. Economic Activities (Primary, Secondary, Tertiary, and Quaternary Sectors)

Economic geography categorizes activities into four main sectors:

- **Primary sector:** agriculture, mining, forestry, fishing.
- **Secondary sector:** manufacturing and industries.
- **Tertiary sector:** trade, transport, services.
- **Quaternary sector:** knowledge-based services such as IT, research, and education.

Example: Pakistan's economy is primarily dependent on the primary sector (agriculture), while developed countries like Japan or the USA dominate in the secondary and quaternary sectors.

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4. Trade and Transport Networks

The movement of goods, services, and people requires effective trade and transportation systems. Economic geography studies how transportation routes (roads, railways, airways, and shipping) and trade agreements affect regional development.

Example: China's Belt and Road Initiative (BRI) and the China-Pakistan Economic Corridor (CPEC) aim to enhance connectivity, creating new opportunities for trade and industry in South Asia.

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5. Industrial Location and Agglomeration

Industries often cluster together to benefit from shared infrastructure, labor supply, and markets. This phenomenon is known as agglomeration. Economic geography studies such patterns to explain why certain regions develop industrial hubs.

Example: Silicon Valley in the USA is an agglomeration of technology industries, while Sialkot in Pakistan is a cluster of sports goods manufacturing.

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6. Regional Inequality and Development

Economic geography also focuses on why some regions prosper while others lag. Differences in infrastructure, education, governance, and resources lead to uneven development.

Example: In Pakistan, Punjab is more economically developed compared to Balochistan due to better infrastructure and industrial investment.

Modern Approaches in Economic Geography

While fundamental concepts laid the groundwork, modern approaches in economic geography focus on

globalization, technology, sustainability, and the interconnected nature of economies.

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1. Quantitative and Spatial Analysis Approach

Modern economic geography uses statistical models, Geographic Information Systems (GIS), and mapping to study economic patterns. This approach helps in visualizing trade flows, industrial distribution, and population growth.

Example: GIS is used to analyze crop yield distribution across Pakistan to improve agricultural planning.

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2. Behavioral Approach

This approach emphasizes the decision-making process of individuals, firms, and governments. It studies how perceptions, risks, and attitudes affect economic choices.

Example: A farmer in Sindh may choose to grow wheat instead of sugarcane due to water scarcity, reflecting individual decision-making within economic geography.

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3. Systems Approach

This approach views the economy as a system where inputs (resources, labor, capital) are processed into outputs (goods and services). The focus is on the interrelationship between different sectors.

Example: In Pakistan, the agriculture sector provides raw material (cotton) to the textile sector, which then contributes to exports.

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4. Political Economy Approach

This approach highlights the role of political decisions, governance, and international relations in shaping economic geography. It explores how policies, trade agreements, and power dynamics impact economies.

Example: Trade sanctions on Iran affected its economy, while Pakistan's trade with China has expanded under political agreements such as CPEC.

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5. Globalization and World-Systems Theory

Modern economic geography emphasizes globalization and interconnected economies. The world-systems theory divides countries into core, semi-periphery, and periphery based on their economic roles.

Example: The USA and Western Europe act as core countries, China and India as semi-periphery, and many African nations as periphery due to resource dependency. Pakistan falls between semi-periphery and periphery due to its developing economy.

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6. Sustainable Development and Environmental Concerns

Modern approaches also focus on balancing economic growth with environmental sustainability. Issues like climate change, deforestation, and industrial pollution are central to contemporary studies in economic geography.

Example: Pakistan faces challenges of industrial pollution in cities like Lahore and Karachi, making sustainable development policies crucial for economic geography studies.

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7. Technological and Digital Economy

The modern world has shifted towards knowledge and technology-based economies. Economic geography now studies digital connectivity, IT hubs, and e-commerce.

Example: Pakistan’s IT industry in cities like Lahore and Karachi is growing, contributing to digital exports. On the global level, Bangalore in India is known as a global IT hub.

Relevance of Concepts and Approaches with Examples

The combination of fundamental concepts and modern approaches makes economic geography highly relevant in today's world. By understanding location, resources, and trade networks, we can explain why some regions are industrial hubs while others are agricultural. Modern approaches help policymakers and researchers use technology, political insights, and sustainability models to address global challenges.

Example 1: Pakistan's dependence on agriculture (fundamental concept) and its efforts under CPEC (modern political economy approach) show how traditional and modern perspectives complement each other.

Example 2: Global climate change concerns (modern sustainability approach) highlight the need for green policies in Pakistan's industrial cities like Faisalabad and Lahore.

Example 3: The rise of freelancing and IT exports from Pakistan demonstrates the growing importance of the digital economy in shaping modern economic geography.

Final Evaluation

Economic geography, through its fundamental concepts like location, resources, and trade, helps us understand the traditional foundation of economies, while modern approaches such as globalization, sustainability, and technology highlight the evolving nature of economies in the 21st century. Both perspectives are essential for explaining regional development, addressing inequalities, and guiding policymaking in countries like Pakistan, where economic growth depends on a blend of traditional agriculture and emerging modern industries.

Q.2 Into how many climatic regions is Pakistan divided? Analyze each climatic zone in detail, highlighting its characteristics and impact.

Pakistan is a geographically diverse country, and due to its varying latitudes, altitudes, and physical features, it experiences a wide range of climatic conditions. Unlike countries with uniform climates, Pakistan's climate ranges from arid deserts to temperate valleys and from subtropical plains to alpine mountains. Climatologists and geographers generally divide Pakistan into **five major climatic regions**, each with distinct weather patterns, natural resources, and socio-economic impacts. These regions are:

1. The Tropical and Subtropical Arid Climate (Desert Climate)

2. The Tropical and Subtropical Steppe Climate (Semi-Arid Climate)

3. The Subtropical Humid Climate (Monsoon Climate)

4. The Temperate Continental Climate (Highland and Northern Areas)

5. The Mountain or Alpine Climate (Glaciated Zones)

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1. Tropical and Subtropical Arid Climate (Desert Climate)

This climatic zone covers the **southern and southwestern regions** of Pakistan, particularly **Sindh (Thar Desert) and parts of Balochistan (Chagai Desert, Kharan Desert)**.

Characteristics:

- Extremely hot summers with temperatures often rising above **45°C**.
- Very low rainfall, usually **less than 200 mm annually**.
- Winters are mild and short.
- High evaporation rate due to intense heat.
- Vegetation is sparse, with drought-resistant plants like thorny bushes.

Impact:

- Agriculture depends heavily on irrigation, especially from the **Indus River and canal systems**.

- Water scarcity and desertification are major challenges.

- Population density is low, and communities rely on livestock rearing (camels, goats, sheep).

- Thar coal reserves in Sindh and natural gas in Balochistan highlight the economic significance of this zone despite harsh conditions.

Example: The **Thar Desert in Sindh** is a classic representation, where droughts are frequent, and people depend on rain-fed agriculture and migration during dry periods.

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2. Tropical and Subtropical Steppe Climate (Semi-Arid Climate)

This zone includes areas with slightly more rainfall than deserts, covering parts of **Punjab (southern and western Punjab), northern Sindh, and some regions of Khyber Pakhtunkhwa (D.I. Khan)**.

Characteristics:

- Hot summers with temperatures reaching **40–45°C**.

- Rainfall between **200–500 mm annually**, mostly during monsoon.
- Winters are relatively cool and short.
- Vegetation includes grasses, shrubs, and scattered trees.

Impact:

- Agriculture is possible but relies on irrigation as rainfall is not sufficient.
- Crops like wheat, cotton, sugarcane, and millet are cultivated.
- Semi-arid climate is prone to droughts, creating challenges for food security.
- Livestock farming is common in these areas.

Example: Multan and Bahawalpur regions in Punjab represent this climate, known for cotton production, mango orchards, and livestock farming.

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3. Subtropical Humid Climate (Monsoon Climate)

This region covers parts of **northeastern Punjab, Islamabad, Hazara Division (KPK), and Azad Kashmir**. It is strongly influenced by the **Southwest Monsoon winds**.

Characteristics:

- Summers are hot but receive significant rainfall during **July–September**.
- Rainfall ranges from **750–1500 mm annually**, making it one of the wettest zones in Pakistan.
- Winters are cool, with occasional snowfall in higher areas.
- Lush green vegetation and fertile soil dominate this climate zone.

Impact:

- Agricultural productivity is high due to abundant rainfall and fertile alluvial soils.
- Crops like rice, wheat, sugarcane, maize, and fruits (citrus, guava, apples) thrive.

- This zone supports dense populations and major urban centers like **Lahore and Islamabad**.

- However, heavy rainfall also causes floods, damaging crops and infrastructure.

Example: The **Potohar Plateau and Hazara Division** receive heavy monsoon rains, supporting rain-fed agriculture but also facing risks of soil erosion.

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4. Temperate Continental Climate (Highland and Northern Areas)

This zone includes areas of **Khyber Pakhtunkhwa, Gilgit-Baltistan, and northern Balochistan** at moderate altitudes.

Characteristics:

- Summers are short and mild, while winters are long and very cold.

- Rainfall varies but is generally higher than arid regions (up to 1000 mm in some valleys).

- Snowfall occurs frequently in winter.

- The terrain includes valleys, hills, and rugged mountains.

Impact:

- Supports a variety of fruits like apples, cherries, apricots, and walnuts.
- Forests (pine, deodar, fir) thrive in these conditions, providing timber resources.
- Tourism flourishes in valleys like **Swat, Hunza, and Skardu**, which attract visitors for their pleasant summer climate.
- Harsh winters and landslides sometimes disrupt communication and transportation.

Example: Murree and Swat Valley are popular tourist resorts with temperate climates, providing natural beauty and cool weather.

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5. Mountain or Alpine Climate (Glaciated Zones)

This region includes the **extreme northern parts of Gilgit-Baltistan and Chitral**, where some of the world's

highest mountains (Karakoram, Himalayas, Hindu Kush) are located.

Characteristics:

- Extremely cold climate, with temperatures often dropping below **–20°C** in winter.
- Heavy snowfall and permanent glaciers, including **Siachen, Baltoro, and Biafo**.
- Rainfall is low, but snow accumulation is high.
- Vegetation is scarce due to altitude, with only alpine meadows and shrubs.

Impact:

- Glaciers act as water reservoirs for the Indus River system, sustaining agriculture in Pakistan’s plains.
- Population density is very low due to harsh climate.
- Livelihood depends on livestock, limited farming in valleys, and tourism (mountaineering, trekking).

- The climate zone is strategically important due to its proximity to China, India, and Afghanistan.

Example: Skardu and Gilgit regions represent alpine climates, serving as gateways to peaks like **K2 and Nanga Parbat**.

Overall Impact of Climatic Zones on Pakistan

- **Agriculture:** Climate zones determine the types of crops grown in Pakistan, ranging from wheat and rice in fertile plains to fruits in temperate valleys.

- **Economy:** Desert and semi-arid regions rely on irrigation, while monsoon areas and northern valleys are naturally fertile.

- **Population Distribution:** Densely populated areas like Punjab are in monsoon and semi-arid regions, while deserts and alpine climates have sparse populations.

- **Natural Hazards:** Floods in monsoon regions, droughts in deserts, and landslides in alpine zones show the risks associated with diverse climates.

- **Tourism:** Northern areas benefit from alpine and temperate climates, attracting international tourists.

Conclusion

Pakistan’s division into **five climatic regions** highlights its environmental diversity. Each climatic zone—whether desert, semi-arid, monsoon, temperate, or alpine—shapes not only the physical landscape but also the social, economic, and cultural life of its people. While arid regions face water scarcity, fertile monsoon areas support agriculture, and alpine climates sustain glaciers that feed Pakistan’s rivers. This climatic diversity is both a blessing and a challenge, requiring careful planning and sustainable resource management.

Q.3 How are natural resources classified based on their nature? Provide a detailed account with relevant examples.

Natural resources are the gifts of nature that exist without human intervention. They provide the foundation for human survival, economic prosperity, technological development, and cultural growth. Every society, whether developed or developing, depends heavily on natural resources for its sustenance. Without them, food production, industrialization, housing, transport, and even cultural practices cannot survive. The classification of natural resources is not only necessary for academic purposes but also essential for understanding how societies should plan for sustainable usage. When classified **based on their nature**, natural resources can be divided into five major categories: **renewable, non-renewable, biotic, abiotic, and perpetual (inexhaustible) resources**. Each category has unique characteristics, functions, and implications for development.

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1. Renewable Resources

Renewable resources are those that can be replenished naturally within a reasonable time span. They regenerate through ecological processes like the hydrological cycle,

photosynthesis, or breeding. However, renewable does not mean unlimited. If these resources are misused, exploited, or polluted beyond recovery, they may lose their regenerative ability.

Characteristics of Renewable Resources:

- Can regenerate naturally within human lifetimes.
- Sustainable if used carefully.
- Vulnerable to overexploitation and environmental degradation.

Examples:

- **Water:** Water from rivers, rainfall, and groundwater is renewable. For example, the Indus River in Pakistan replenishes with seasonal rainfall and glacier melting.
- **Forests:** Provide timber, fuel, paper, and oxygen. The forests of Swat and Hazara in Pakistan are renewable, but deforestation threatens their survival.
- **Agricultural crops:** Crops like wheat, rice, maize, and sugarcane regenerate seasonally through planting and harvesting cycles.

- **Livestock and fisheries:** Animals reproduce, and fish stocks replenish naturally if sustainable fishing practices are followed.

Practical Relevance in Pakistan:
Pakistan depends on renewable resources for agriculture, irrigation, and food security. Wheat and rice, grown in Punjab and Sindh, rely on renewable soil and water. Fish from Karachi and Gwadar contribute to exports. Yet, challenges like over-irrigation, pollution of water systems, and deforestation threaten these resources. Sustainable management policies such as reforestation campaigns and water conservation programs are vital.

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2. Non-Renewable Resources

Non-renewable resources are finite and cannot be replenished within a human lifetime. They take millions of years to form, and once exhausted, they are gone forever. These resources are highly valuable and fuel global industrial and technological progress.

Characteristics of Non-Renewable Resources:

- Fixed supply, cannot regenerate quickly.

- Extraction and use lead to depletion.

- Highly valuable for industrial growth and power generation.

Examples:

- **Fossil fuels:** Petroleum, coal, and natural gas are prime examples.

- **Minerals:** Copper, gold, silver, and iron ore are widely used in industries.

- **Radioactive elements:** Uranium and thorium, used for nuclear energy.

Practical Relevance in Pakistan:
Pakistan is rich in non-renewable resources. The **Thar Desert coal reserves** are among the largest in the world, holding potential for electricity generation. **Sui gas fields in Balochistan** supply natural gas nationwide. **Reko Diq in Balochistan** holds vast copper and gold reserves. However, mismanagement, smuggling, and lack of modern extraction technology hinder efficient utilization. Dependency on imported fuel despite local reserves highlights the need for better planning.

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3. Biotic Resources

Biotic resources are derived from living organisms such as plants, animals, and humans. They form the biological basis of human survival and contribute directly to food, clothing, fuel, and shelter.

Characteristics of Biotic Resources:

- Organic and living in origin.
- Can be renewable (agriculture, livestock) or non-renewable (fossil fuels formed from ancient organisms).
- Essential for sustaining life and economy.

Examples:

- **Forests:** Provide timber, fruits, paper, and medicine.
- **Agriculture:** Wheat, rice, maize, cotton, and sugarcane.
- **Livestock:** Cattle, goats, camels, and poultry provide milk, meat, wool, and leather.

- **Fisheries:** Marine and freshwater fish resources.

- **Fossil fuels:** Though categorized as non-renewable, they are biotic in origin because they come from decomposed plant and animal remains.

Practical Relevance in Pakistan:
Pakistan's economy heavily relies on biotic resources. Agriculture contributes significantly to GDP, with Punjab producing staple crops like wheat and rice. Cotton, another biotic resource, fuels Pakistan's textile industry, which is the country's largest export sector. Livestock farming provides milk, meat, and hides, essential for rural livelihoods. Fisheries in Gwadar and Karachi contribute to exports. However, overgrazing, overfishing, and poor agricultural practices threaten sustainability.

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4. Abiotic Resources

Abiotic resources are non-living resources derived from the physical and chemical environment. They include minerals, water, soil, and air. These resources form the physical foundation of human civilization and industrial progress.

Characteristics of Abiotic Resources:

- Inorganic and non-living.
- Mostly finite, except for air and some water cycles.
- Essential for industry, agriculture, and technology.

Examples:

- **Soil:** Fertile soil supports agriculture.
- **Minerals:** Iron, copper, salt, and gypsum.
- **Water:** Freshwater and groundwater.
- **Air:** Oxygen and nitrogen essential for respiration and industrial use.

Practical Relevance in Pakistan:

Pakistan has valuable abiotic resources. The **Khewra Salt Mines in Punjab** are among the largest salt reserves in the world. Copper and gold in **Saindak and Reko Diq** are industrially important. Fertile alluvial plains of Punjab sustain agriculture, while the Indus River system supports irrigation. However, soil erosion, waterlogging, and pollution threaten abiotic resources. Efficient management policies are required to prevent degradation.

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5. Perpetual (Inexhaustible) Resources

Perpetual resources are those that are unlimited and will never run out, regardless of consumption. They are sustainable, eco-friendly, and essential for future energy needs.

Characteristics of Perpetual Resources:

- Unlimited supply.
- Do not degrade with use.
- Require technology to harness effectively.

Examples:

- **Solar energy:** The sun provides constant energy.
- **Wind energy:** Wind turbines convert kinetic energy into electricity.
- **Tidal energy:** Generated from ocean tides.
- **Geothermal energy:** Heat from Earth’s interior.

Practical Relevance in Pakistan:

Pakistan has immense potential for renewable energy. Solar energy projects in Punjab and Balochistan can meet electricity shortages. The **wind corridor in Sindh (Jhimpir and Gharo)** is being developed for wind power. The Indus Delta holds potential for tidal energy. If harnessed effectively, these resources can reduce Pakistan's dependency on fossil fuels and help achieve energy security.

Comparative Table: Classification of Natural Resources Based on Nature

Type of Resource	Nature	Examples	Relevance in Pakistan
Renewable	Regenerate naturally	Water, forests, crops	Indus River irrigation, agriculture in Punjab and Sindh
Non-renewable	Finite, exhaustible	Coal, oil, gas, copper	Thar coal, Sui gas, Reko Diq gold and copper
Biotic	Derived from living organisms	Wheat, rice, livestock, fisheries	Cotton in Punjab, Gwadar fisheries, dairy farming

Abiotic	Non-living, inorganic	Soil, minerals, air, water	Khewra salt, fertile plains, Saindak copper
Perpetual	Unlimited, inexhaustible	Solar, wind, tidal, geothermal	Solar power in Balochistan, wind power in Sindh

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Conclusion

Natural resources classified by their nature include renewable, non-renewable, biotic, abiotic, and perpetual categories. Each type has distinct features and importance for human survival and development. In Pakistan, renewable resources like agriculture and water sustain food security, while non-renewable resources like coal and natural gas fuel industries. Biotic resources provide food and clothing, abiotic resources supply minerals and soil fertility, while perpetual resources like solar and wind promise a sustainable future. Mismanagement and overexploitation pose serious threats, making conservation and sustainable usage essential. By adopting renewable energy, practicing reforestation, and managing resources wisely, Pakistan can secure economic stability and compete with developed nations in achieving sustainable growth.

Q.4 Discuss the current state and development of Pakistan’s iron and steel industry, including major production units and their contributions.

The iron and steel industry is considered the backbone of industrial development in any country. It provides the raw materials necessary for infrastructure, construction, machinery, transport, defense, and household industries. In Pakistan, this sector holds significant potential due to growing urbanization, industrialization, and population expansion. However, despite its importance, the iron and steel industry in Pakistan faces numerous challenges that have hindered its full potential. To understand the current state and development, it is necessary to analyze the history, present situation, major production units, contributions, and challenges of this industry.

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1. Historical Background of Iron and Steel Industry in Pakistan

At the time of independence in 1947, Pakistan inherited almost no industrial base, including no significant iron and steel facilities. The country relied heavily on imports for steel and iron products to meet its construction and industrial needs. Recognizing the importance of self-sufficiency in steel production, the government initiated efforts in the 1950s and 1960s to develop a steel

industry. The most important milestone was the establishment of **Pakistan Steel Mills (PSM)** in Karachi, which began production in 1981. This project, set up with technical assistance from the former Soviet Union, was expected to transform Pakistan's industrial landscape.

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2. Current State of Iron and Steel Industry

Pakistan's iron and steel industry today is a mixture of public and private sector enterprises. While the private sector has become increasingly active in recent decades, the public sector, particularly Pakistan Steel Mills, has faced severe decline.

Current features of the industry:

- The industry contributes nearly **1.5–2% of GDP**.
- Pakistan produces steel mainly through **electric arc furnaces, induction furnaces, and re-rolling mills**, as large-scale integrated steel production is limited.
- The domestic demand for steel is rising due to **CPEC projects, housing schemes, infrastructure, and defense needs**.
- A significant portion of steel is still imported, especially **hot-rolled coils (HRC)** and specialized

steel types.

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3. Major Production Units of Iron and Steel in Pakistan

a) Pakistan Steel Mills (PSM), Karachi

- **Background:** Established in 1973 with Soviet assistance, located near Karachi on 18,000 acres of land.
- **Capacity:** Designed to produce **1.1 million tons per year**, with expansion potential to 3 million tons.
- **Current Status:** Unfortunately, PSM has been non-functional since 2015 due to mismanagement, corruption, and lack of modernization. Its closure has forced Pakistan to depend more on imports and private steel producers.
- **Contribution:** Despite its shutdown, it remains a symbol of Pakistan's industrial capacity. Reviving PSM is considered crucial for reducing import dependency.

b) Pakistan Steel Re-Rolling Mills Association (PSRMA)

- Comprises numerous small and medium-sized re-rolling mills across Punjab, Sindh, and Khyber

Pakhtunkhwa.

- Produces **steel bars, rods, and girders** essential for construction.
- Collectively, these mills provide more than **40% of Pakistan's steel supply**.

c) Private Sector Units

In recent decades, private companies have emerged as key players, especially in Punjab.

1. **Mughal Steel (Lahore):**
    - One of the leading steel producers in Pakistan.
    - Produces steel bars, billets, and structural products.
    - Supplies steel for infrastructure projects like dams, highways, and power plants.
2. **Amreli Steels (Karachi):**
    - Specializes in steel rebars and construction steel.

- Has modernized its production facilities with European technology.

- Plays an important role in the construction sector, particularly in Karachi's high-rise buildings.

3. **Ittefaq Group (Lahore):**

    - Historically one of the oldest private steel groups in Pakistan.

    - Produces rolled steel products, mainly for domestic consumption.

4. **Agha Steel Industries (Karachi):**

    - Known for introducing modern arc furnace technology.

    - Supplies high-quality steel products for CPEC projects and Karachi's urban infrastructure.

5. **Peoples Steel Mills (Karachi):**

    - Established in 1975 with Japanese collaboration.

- Specializes in alloy and special steels, used in **defense, aerospace, and engineering industries**.

- Provides critical raw material to the Pakistan Ordnance Factories and automobile industry.

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4. Contributions of the Iron and Steel Industry

1. **Infrastructure Development:**
   Steel bars and girders are widely used in roads, bridges, railways, and dams. Projects like **Tarbela Dam, Mangla Dam, CPEC highways, and Gwadar port** depend on steel.

2. **Construction Sector:**
   With rapid urbanization and housing schemes, especially under the **Naya Pakistan Housing Scheme**, demand for steel bars, pipes, and sheets has increased.

3. **Defense Industry:**
   Peoples Steel Mills produces special alloys and steel for **military hardware, tanks, aircraft, and naval equipment**, supporting national security.

4. **Employment Generation:**
   The industry employs thousands of workers directly and indirectly. From mining iron ore to running steel mills, it provides significant employment opportunities.

5. **Industrialization:**
   Steel provides raw material for automobile, shipbuilding, machinery, tools, and appliance industries. Without steel, Pakistan's industrial base cannot grow.

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5. Challenges Facing the Iron and Steel Industry

1. **Dependence on Imports:**
   Pakistan imports raw materials like iron ore, coal, and finished steel products, leading to a high trade deficit.

2. **Closure of Pakistan Steel Mills:**
   The non-functioning of PSM has forced reliance on private producers and imports, reducing self-sufficiency.

3. **Energy Crisis:**
   Steel production is highly energy-intensive. Frequent electricity shortages and high gas tariffs increase

costs.

4. **Technological Backwardness:**
   Many small re-rolling mills use outdated machinery, resulting in low efficiency and poor-quality products.

5. **Policy Inconsistency:**
   Frequent changes in government policies, high taxation, and lack of subsidies discourage investment.

6. **Competition with Imports:**
   Cheaper steel imports from China and other countries often undercut local producers, reducing their competitiveness.

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6. Development and Future Prospects

Despite challenges, the iron and steel industry of Pakistan has strong growth potential:

- **CPEC Projects:** Large-scale infrastructure projects under CPEC, such as motorways, railways, and power plants, require massive steel inputs.

- **Housing Demand:** With a housing shortage of nearly 10 million units, the construction sector promises

growing steel demand.

- **Local Iron Ore Deposits:** Pakistan has iron ore reserves in **Kalabagh (Punjab), Chiniot (Punjab), and Nokkundi (Balochistan)**. Effective mining can reduce import dependency.

- **Revival of PSM:** If modernized and managed properly, Pakistan Steel Mills could produce millions of tons of steel annually, making Pakistan self-reliant.

- **Private Sector Expansion:** Firms like Agha Steel, Mughal Steel, and Amreli Steels are investing in modern technology, which will enhance production quality and quantity.

Conclusion

The iron and steel industry in Pakistan has developed considerably over the past decades but still struggles with inefficiency, mismanagement, and dependency on imports. While Pakistan Steel Mills once symbolized national industrial strength, its closure has left a major gap that private producers are trying to fill. Companies like Amreli Steels, Mughal Steel, and Agha Steel are playing a critical role in meeting domestic demand. For Pakistan’s

long-term industrial progress, revival of PSM, exploitation of local iron ore reserves, energy sector reforms, and technological modernization are essential. If these challenges are addressed, Pakistan can not only meet its domestic needs but also emerge as a regional exporter of steel products.

Q.5 What are the key modes of transportation in Pakistan? Evaluate their role and impact on the growth of national industries.

Transportation is considered the backbone of any nation's economy because it connects resources, industries, markets, and people. In the case of Pakistan, a developing country with a growing population and industries, transportation holds even greater importance. Pakistan's geographical location makes it a central hub for trade between South Asia, Central Asia, and the Middle East. To fully utilize its potential, Pakistan relies on multiple modes of transportation, including road, rail, air, water, and pipelines. Each mode plays a crucial role in supporting industrial growth, regional development, and international trade. However, challenges such as outdated infrastructure, lack of modern technology, and inefficient management hinder their full potential. Below is a detailed discussion of the key transportation modes in Pakistan and their contribution to industrial growth.

Road Transport in Pakistan

Road transport is the most widely used mode of transportation in Pakistan. It accounts for nearly 90% of passenger traffic and over 65% of freight traffic. Roads provide flexibility, connectivity, and access to even the remotest areas. The road network of Pakistan includes

national highways, motorways, expressways, and provincial roads.

- **National Highways and Motorways**: The National Highway Authority (NHA) manages around 12,000 km of highways, which connect major cities and industrial hubs. The development of the motorway system, such as M-1 (Islamabad–Peshawar), M-2 (Islamabad–Lahore), and M-9 (Karachi–Hyderabad), has reduced travel time and enhanced trade efficiency.

- **CPEC and Road Development**: The China-Pakistan Economic Corridor (CPEC) has further upgraded Pakistan's road network. Roads connecting Gwadar Port to Kashgar (China) are vital for boosting trade and linking industries with international markets.

Impact on Industries:
Road transport helps in quick delivery of raw materials to factories and finished goods to markets. For example, the textile industry of Faisalabad, the cement factories of Khyber Pakhtunkhwa, and the surgical goods industry of Sialkot all rely heavily on road networks to transport products domestically and internationally. However, issues like traffic congestion, poor maintenance, and rising fuel costs affect efficiency.

Rail Transport in Pakistan

Railways once served as the primary mode of transportation in Pakistan, especially for freight. Pakistan Railways has a track network of over 7,700 km, linking major industrial and commercial centers.

- **Freight Services**: Pakistan Railways provides cost-effective transport for bulk goods such as coal, cement, fertilizers, and agricultural produce.

- **Decline and Challenges**: Despite its potential, rail transport in Pakistan has declined due to outdated infrastructure, corruption, poor management, and lack of investment. Many industries now prefer roads due to flexibility and faster services.

Impact on Industries:
Rail transport is particularly important for heavy and bulk industries. For instance, the coal required by power plants or the cement needed for construction projects can be transported efficiently by rail. Reviving railway freight services could significantly reduce industrial costs, improve efficiency, and ease pressure on roads.

Air Transport in Pakistan

Air transport plays a limited but highly significant role in Pakistan's economy. Pakistan International Airlines (PIA),

along with private airlines, operates domestic and international routes. Major airports include Jinnah International Airport (Karachi), Allama Iqbal International Airport (Lahore), and Islamabad International Airport.

- **Domestic Role**: Air transport connects remote areas such as Gilgit-Baltistan and Balochistan with major urban centers.

- **International Role**: It facilitates export of high-value goods such as textiles, leather products, surgical instruments, and perishable goods like fruits and vegetables.

Impact on Industries:
Air transport is critical for industries that deal in time-sensitive or high-value exports. For instance, mango exports from Sindh and Punjab, or surgical instrument exports from Sialkot, often rely on air transport for reaching international markets quickly. However, limited capacity, high costs, and inefficiency in national airlines affect competitiveness.

Water Transport in Pakistan

Water transport is one of the most cost-effective modes of transportation. Pakistan has access to the Arabian Sea,

and its major seaports include Karachi Port, Port Qasim, and Gwadar Port.

- **Karachi Port**: The oldest and busiest seaport in Pakistan, handling most of the country's exports and imports.

- **Port Qasim**: Located near Karachi, it is a modern port handling industrial cargo, including oil, steel, and machinery.

- **Gwadar Port**: Developed under CPEC, Gwadar Port is strategically important as it provides the shortest route for Chinese trade to the Arabian Sea and reduces dependency on longer routes.

Impact on Industries:
Ports are crucial for the export-oriented industries of Pakistan, such as textiles, sports goods, and surgical instruments. The steel and oil industries also depend on imports arriving at these ports. The development of Gwadar Port is expected to revolutionize Pakistan's industrial landscape by creating new economic zones and attracting foreign investment.

Pipeline Transport in Pakistan

Pipeline transport is used mainly for oil and gas. Pakistan has an extensive network of pipelines managed by companies like Sui Northern Gas Pipelines Limited (SNGPL) and Sui Southern Gas Company (SSGC).

- **Oil Pipelines**: Used to transport petroleum products from Karachi to refineries and industrial zones.

- **Gas Pipelines**: Supply natural gas to households, industries, and power plants.

Impact on Industries:
Industries such as fertilizers, cement, and textiles rely heavily on uninterrupted supply of natural gas. Pipelines provide a safe, cost-effective, and efficient means of transport compared to road tankers. However, challenges like gas shortages, theft, and lack of expansion hinder industrial growth.

Comparative Evaluation of Transport Modes

Mode of Transport	Strengths	Weaknesses	Industrial Impact
Road	Flexible, widespread,	Congestion, fuel cost,	Essential for textiles,

	quick delivery	maintenance issues	cement, surgical goods
Rail	Cost-effective for bulk goods	Outdated system, mismanagement	Important for coal, cement, agriculture
Air	Fast, international trade support	Expensive, limited capacity	Crucial for exports of perishable and high-value goods
Water	Cheapest for bulk trade, international link	Limited inland waterways, port congestion	Key for exports and imports, Gwadar development
Pipeline	Safe, efficient, low-cost	Theft, shortages, limited expansion	Vital for energy, fertilizers, textiles

Conclusion

Transportation is not just a physical movement system but a lifeline for industrial and economic growth. In Pakistan, road transport dominates, but over-reliance on it causes inefficiency. Railways need modernization, while air and

sea transport must be expanded to support global trade. Pipelines are crucial for energy supply, but issues like shortages limit their effectiveness. For Pakistan to compete with developed nations and boost its industrial capacity, a balanced, modern, and integrated transport system is essential. Investments in CPEC-related projects, railway modernization, and Gwadar Port development are steps in the right direction. Ultimately, a strong transportation system can lower production costs, expand trade, attract foreign investment, and promote industrialization in Pakistan.