

# CBSE 12th 2024 Compartment Geography Set-1 (64/S/1) Solutions

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## SECTION A

Questions no. 1 to 17 are Multiple Choice Type Questions.

**Q.1. Which one of the following is a component of population change in the world?**

- (A) Urbanisation
- (B) Industrialisation
- (C) Migration
- (D) Education

**Solution. (C) Migration** ,The component of population change in the world from the options provided is Migration

Migration directly affects population change as it involves the movement of people from one place to another, influencing the population size and distribution in different regions. Urbanisation, industrialization, and education can influence population trends but are not components of population change themselves.

**Q.2. Which one of the following is the positive impact of irrigation in the 'Indira Gandhi Canal Command Area'?**

- (A) Waterlogging
- (B) Increase in agricultural productivity
- (C) Increase in soil salinity
- (D) Increase in evaporation from canal water

**Solution. (B) Increase in agricultural productivity** ,The positive impact of irrigation in the 'Indira Gandhi Canal Command Area' is (B) Increase in agricultural productivity

The introduction of irrigation through the Indira Gandhi Canal has significantly boosted agricultural productivity in the region by providing a reliable water source for crops. This has led to improved crop yields and expanded agricultural activities in an otherwise arid area.

**Q.3. The 'Brundtland Report' is known by which one of the following?**

- (A) Our Common Future**
- (B) The Population Bomb**
- (C) The Limits to Growth**
- (D) Redistribution with Growth**

**Solution.(A) Our Common Future** , The 'Brundtland Report' is known by (A) Our Common Future

The report, officially titled "Our Common Future," was published in 1987 by the World Commission on Environment and Development (WCED) chaired by Gro Harlem Brundtland. It is widely recognized for its definition of sustainable development and its emphasis on balancing economic growth with environmental protection.

**Q.4. Bharmour tribal region is dominated by which one of the following tribes ?**

- (A) Gond**
- (B) Santhal**
- (C) Bhils**
- (D) Gaddi**

**Solution. (D) Gaddi** , The Bharmour tribal region is dominated by: (D) Gaddi, The Gaddi tribe is indigenous to the Bharmour region in Himachal Pradesh, India. They are known for their distinctive cultural practices and traditional way of life in this mountainous area.

**Q.5. Tea plantation was started in India for the first time in which one of the following areas?**

- (A) Nilgiri Hills**
- (B) Cardamom Hills**
- (C) Brahmaputra Valley of Assam**
- (D) Darjeeling and Jalpaiguri**

**Solution.(C) Brahmaputra Valley of Assam** , Tea plantation was started in India for the first time in:

(C) Brahmaputra Valley of Assam, Tea cultivation began in the Brahmaputra Valley of Assam in the early 19th century. This region proved to be highly suitable for tea cultivation due to its climate and soil conditions, and it remains one of the major tea producing areas in India today.

**Q.6. Which of the following pairs of states is the leading producer of cotton in India?**

- (A) Gujarat and Maharashtra**
- (B) Karnataka and Tamil Nadu**
- (C) Punjab and Haryana**
- (D) Rajasthan and Madhya Pradesh**

**Solution.** The leading producer of cotton in India is(A) Gujarat and Maharashtra, These two states are the primary cotton growing regions in India. Gujarat and Maharashtra have favourable climates and soil conditions for cotton cultivation, making them the top producers of cotton in the country.

**Q.7. Which one of the following sectors utilises the highest surface and groundwater in India?**

- (A) Industrial**
- (B) Power**
- (C) Agricultural**
- (D) Domestic**

**Solution.(C) Agricultural** , The sector that utilises the highest surface and groundwater in India is (C) Agricultural

Agriculture consumes the largest share of water resources in India, both from surface water (like rivers and lakes) and groundwater sources. This high water usage is due to the extensive irrigation needed for crops, which makes agriculture the predominant sector in terms of water consumption.

**Q.8. 'Haryali' , a watershed development project in India, is sponsored by which one of the following?**

- (A) Central Government**
- (B) State Governments**
- (C) District Administration**
- (D) NonGovernmental Organisation**

**Solution. (B) State Governments** ,The 'Haryali' watershed development project in India is sponsored by:(B) State Governments

'Haryali' is a state level initiative aimed at improving water resources, promoting soil conservation, and enhancing agricultural productivity through watershed development. It is primarily implemented and funded by state governments to address local water management and agricultural needs.

**Q.9. Which one of the following is a natural harbour and the biggest sea port of India?**

- (A) Kolkata port**
- (B) Chennai port**
- (C) Mumbai port**
- (D) Kandla port**

**Solution. (C) Mumbai port**, The natural harbour and the biggest sea port of India is (C) Mumbai port

Mumbai port, also known as the Mumbai Dock, is a natural deepwater harbour and is the largest and busiest port in India. Its strategic location and natural harbour make it a key hub for maritime trade.

**Q.10. Under which one of the following commodities was the export from India the highest during 2016-17?**

- (A) Agriculture and allied products**
- (B) Ores and minerals**
- (C) Manufactured goods**
- (D) Crude and petroleum products**

**Solution.** During 2016-17, the highest export from India was under:

(C) Manufactured goods

India's exports of manufactured goods, including textiles, chemicals, machinery, and engineering products, were the largest category of exports for that period, reflecting the country's strong industrial and manufacturing base.

**Q.11. Read the following sources of land pollution carefully and choose the most appropriate option:**

- I. Improper human activities.**
- II. Use of fertilisers and pesticides.**
- III. Use of groundwater for irrigation.**
- IV. Disposal of untreated industrial waste.**

**Options:**

- (A) Only I, II and III are correct.**
- (B) Only II, III and IV are correct.**
- (C) Only I, II and IV are correct.**
- (D) Only I, III and IV are correct.**

**Solution.** (C) Only I, II and IV are correct. The most appropriate option regarding the sources of land pollution is (C) Only I, II and IV are correct.

I. Improper human activities: These contribute to land pollution through actions like illegal dumping, deforestation, and construction activities.

II. Use of fertilisers and pesticides: Excessive use of these chemicals can lead to soil contamination and degradation.

IV. Disposal of untreated industrial waste: This can contaminate land and soil with hazardous substances.

III. Use of groundwater for irrigation is more related to water pollution and depletion rather than land pollution directly.

**Q.12. Two statements are given below as**

**Assertion (A) and Reason (R). Read them carefully and choose the correct option. Assertion (A): Areas with mineral deposits and industries are densely populated.**

**Reason (R): "Mining and industrial activities generate employment opportunities and thus attract a large population."**

**Options:**

**(A) Assertion (A) is correct, but Reason (R) is not correct.**

**(B) Assertion (A) is not correct, but Reason (R) is correct.**

**(C) Both Assertion (A) and Reason (R) are correct and Reason (R) is the correct explanation of Assertion (A).**

**(D) Both Assertion (A) and Reason (R) are correct, but Reason (R) is not the correct explanation of Assertion (A).**

**Solution.(C) Both Assertion (A) and Reason (R) are correct and Reason (R) is the correct explanation of Assertion (A).**

Assertion (A): Areas with mineral deposits and industries are indeed often densely populated because these areas tend to have higher levels of economic activity, which can attract people.

Reason (R): Mining and industrial activities generate employment opportunities, which attract a large population to these areas.

The reason explains why areas with such economic activities are densely populated, making both statements correct and directly related.

**Q.13. Which of the following is regarded as a Tertiary activity?**

- (A) Cattle rearing**
- (B) Farming**
- (C) Work of plumbers**
- (D) Industrial work**

**Solution. (C) Work of plumbers,**The activity regarded as a tertiary activity is Work of plumbers

Tertiary activities, also known as service activities, involve providing services rather than producing goods. Work of plumbers falls into this category as it involves offering a service related to the maintenance and repair of plumbing systems. In contrast, cattle rearing, farming, and industrial work are primary and secondary activities, respectively.

**Q.14. Two statements are given below as Assertion (A) and Reason (R). Read them carefully and choose the correct option.**

**Assertion (A): "Slums are residential areas of least choice for living."**

**Reason (R): "Slums are associated with unregulated drainage, lack of basic amenities like drinking water, toilets, lights, etc."**

**Options: (A) Assertion (A) is correct, but Reason (R) is not correct.**

**(B) Assertion (A) is not correct, but Reason (R) is correct.**

**(C) Both Assertion (A) and Reason (R) are correct and Reason (R) is the correct explanation of Assertion (A).**

**(D) Both Assertion (A) and Reason (R) are correct, but Reason (R) is not the correct explanation of Assertion (A).**

**Solution. (C) Both Assertion (A) and Reason (R) are correct and Reason (R) is the correct explanation of Assertion (A).**

Assertion (A): Slums are indeed considered residential areas of least choice for living due to their poor living conditions.

Reason (R): Slums are characterised by unregulated drainage and a lack of basic amenities such as drinking water, toilets, and lighting, which contribute to their undesirable living conditions.

Reason (R) explains why slums are considered areas of least choice for living, making both statements correct and directly related.

## **SECTION B**

**Questions number 18 and 19 are Source Based Questions.**

**Q.18. Read the given passage carefully and answer the questions that follow:**

### **A Role Model to Restore the Ecology and Safeguard Human Health in Daurala**

**Based on the universal law "Polluter pays", effort to restore the ecology and safeguard human health with people's participation has taken place in Daurala near Meerut. These efforts are now bearing fruits after a span of three years when a Meerut based NGO had developed a model for ecological restoration. The meeting of the Daurala Industries Officials, NGOs, Government officials and other stakeholders at Meerut has brought out results. The powerful logics, authentic studies and the pressure of people have brought a new lease of life to the twelve thousand residents of this village. It was in the year 2003 that the pitiable condition of Dauralaites drew the attention of the civil society. The groundwater of this village was contaminated with heavy metals. The reason was that the untreated wastewater of Daurala industries was leaching to the groundwater table. The NGO conducted a door to door survey of the health status of the residents and came out with a report. The organisation, the village community and people's representatives sat together to find out sustainable solutions to the health problem. The industrialists showed a keen interest towards checking the deteriorating ecology. The overhead water tank's capacity in the village was enhanced and a 900 m extra pipeline was laid to supply potable water to the community. The silted pond of the village was cleaned and recharged by desilting it. Large quantity of silt was removed paving way to a large quantity of water so that it recharged the aquifers. Rainwater**



**harvesting structures have been constructed at different places which has helped in diluting the contaminants of the groundwater after the monsoons. 1000 trees have also been planted which have improved the environment.**

**(18.1) Mention the problems faced by the people of Daurala.**

**(18.2) Describe measures taken to restore the deteriorating ecology of Daurala.**

**(18.3) Examine the role of NonGovernmental Organisations improving the health status of the people of Daurala.**

**Solution.** (18.1) The people of Daurala faced severe groundwater contamination due to untreated wastewater from local industries. This contamination involved heavy metals, which adversely affected the health of the residents. Additionally, the village lacked adequate potable water supply, and the existing water sources, such as ponds, were silted and unable to recharge the aquifers effectively.

(18.2) Enhancement of Water Supply: The capacity of the overhead water tank in the village was increased, and a 900 metre pipeline was laid to provide potable water to the community.

Desilting and Recharge: The silted pond was cleaned and desilted to improve its water holding capacity and help recharge the aquifers.

Rainwater Harvesting: Structures for rainwater harvesting were constructed at various locations to help dilute contaminants in the groundwater after the monsoons.

Afforestation: Approximately 1,000 trees were planted to enhance the environment and contribute to ecological restoration.

(18.3) Awareness and Action: The NGO played a crucial role in drawing attention to the health issues in Daurala by conducting a door to door survey of residents' health and producing a report on the findings.

Collaboration: They facilitated collaboration between the village community, industrialists, government officials, and other stakeholders to address the health and ecological problems.

Implementation of Solutions: The NGO was instrumental in developing and implementing sustainable solutions, including improving water supply, cleaning and recharging the pond, constructing rainwater harvesting structures, and planting trees.

Advocacy and Pressure: Through their efforts, the NGO was able to mobilise resources, exert pressure, and gather support for restoring the ecology and safeguarding human health in the village.

## SECTION C

**Questions number 20 to 23 are Short Answer Type Questions.**

**Q.20 "Nature provides opportunities and human beings make use of these and slowly nature gets humanised." Examine the statement.**

**Solution.** The statement "Nature provides opportunities and human beings make use of these and slowly nature gets humanised" reflects the interaction between natural environments and human activities. Here's an examination of this concept:

### 1. Opportunities Provided by Nature:

**Natural Resources:** Nature offers various resources such as minerals, water, forests, and fertile land. These resources are essential for human survival and development. For instance, fertile soil supports agriculture, while forests provide timber and medicinal plants.

**Ecological Services:** Nature also provides ecological services, such as clean air and water, pollination of crops, and climate regulation. These services are vital for maintaining environmental balance and supporting human life.

### 2. Human Use of Nature:

**Agricultural Development:** Humans have transformed natural landscapes to create agricultural fields. Forests have been cleared to grow crops and raise livestock, effectively altering natural ecosystems to meet food needs.

**Urbanization and Infrastructure:** The development of cities and infrastructure involves converting natural areas into built environments. This includes constructing roads, buildings, and industrial facilities, which changes the land use patterns and impacts the natural environment.

**Resource Extraction:** Mining, logging, and drilling are examples of how humans exploit natural resources for economic gain. These activities extract resources from nature, often leading to significant environmental changes and degradation.

### 3. Humanisation of Nature:

**Environmental Modification:** As humans use and modify natural resources, they create environments that are shaped by human needs and activities. This includes landscaped parks, agricultural lands, and urban areas where natural features are altered or controlled.

**Cultural Impact:** Human activities also infuse nature with cultural significance. For example, certain landscapes or natural features become culturally or historically important, leading to their preservation or modification according to cultural values.

**Technological Interventions:** Advances in technology have allowed humans to further manipulate nature, such as through climate control systems, irrigation practices, and genetic modifications in agriculture. These interventions reflect how human actions shape and sometimes dominate natural processes.

### 4. Balancing Nature and Human Needs:

**Sustainability:** The statement also underscores the need for balance between utilizing natural resources and preserving the environment. Sustainable practices aim to ensure that while nature is used to meet human needs, its capacity to regenerate and provide ecological services is not compromised.

**Restoration Efforts:** There are efforts to restore and rehabilitate natural environments that have been degraded by human activities. This includes reforestation projects, pollution cleanup, and the establishment of protected areas to conserve biodiversity.

**Q.21. (a) Explain the main aspects of the 'Basic Needs Approach' of human development.**

**Solution.** The 'Basic Needs Approach' to human development focuses on ensuring that all individuals have access to essential resources and services necessary for a minimum standard of living. This approach emphasizes meeting fundamental needs to improve overall wellbeing and quality of life. Here are the main aspects:

1. Core Needs:

**Basic Needs:** The approach prioritizes meeting basic needs such as:

**Food:** Ensuring that everyone has access to sufficient and nutritious food to maintain health.

**Water:** Providing access to clean drinking water and sanitation facilities to prevent waterborne diseases.

**Shelter:** Ensuring adequate housing and protection from environmental hazards.

**Healthcare:** Offering basic medical services and health care to maintain wellbeing and prevent disease.

**Education:** Providing access to basic education and literacy to enhance individual opportunities and capabilities.

2. Human Development Focus:

**Improving Quality of Life:** The approach aims to enhance the quality of life by addressing these fundamental needs. Meeting basic needs is seen as a prerequisite for achieving broader developmental goals and improving human capabilities.

**Equity and Social Justice:** It emphasizes reducing inequalities by ensuring that everyone, especially the most disadvantaged, has access to basic services and resources. This aspect aims to promote social justice and equity.

### 3. Integrated Approach:

**Comprehensive Support:** The Basic Needs Approach integrates various aspects of development. For instance, improving education and healthcare systems can enhance overall wellbeing and productivity. It recognizes that addressing one need often supports the fulfillment of others.

**Community Involvement:** Effective implementation often involves community participation. Local communities are engaged in identifying needs and developing solutions, ensuring that the approach is responsive to local contexts and challenges.

### 4. Policy and Planning:

**Focused Interventions:** Governments and organizations use the Basic Needs Approach to design policies and programs that directly address essential needs. This may include social safety nets, infrastructure development, and targeted assistance programs.

**Monitoring and Evaluation:** Regular assessment of basic needs and their fulfillment helps measure progress and adjust strategies. Monitoring ensures that interventions are effective and reach the intended beneficiaries.

## 5. LongTerm Impact:

**Foundation for Growth:** By ensuring that basic needs are met, individuals are better equipped to pursue higher education, employment, and personal development. This lays the groundwork for sustained economic growth and improved quality of life.

**Human Capabilities:** The approach acknowledges that meeting basic needs enhances human capabilities, allowing individuals to participate more fully in society and contribute to development.

### **OR (b) Explain the main aspects of the 'Welfare Approach' of human development.**

**Solution.** The 'Welfare Approach' to human development centres on providing support and assistance to individuals to improve their standard of living and overall well being. It focuses on addressing the immediate needs of people, particularly those who are disadvantaged or in vulnerable situations. Here are the main aspects of this approach:

#### 1. Focus on Assistance and Support:

**Social Welfare Programs:** The Welfare Approach emphasises the creation and implementation of social welfare programs that provide financial aid, services, and support to those in need. These programs can include:

**Unemployment Benefits:** Financial assistance for individuals who are temporarily out of work.

**Pensions:** Support for the elderly, disabled, and other vulnerable groups.

**Subsidies:** Financial aid for necessities such as food, housing, and healthcare.

**Direct Aid:** The approach often involves direct transfers of resources or benefits to individuals, such as cash transfers, food vouchers, or subsidized housing. This helps address immediate needs and alleviate poverty.

## 2. Addressing Inequality and Vulnerability:

**Targeting Disadvantaged Groups:** The Welfare Approach focuses on supporting marginalized and disadvantaged groups, including the poor, elderly, disabled, and children. The aim is to reduce inequalities and provide a safety net for those who are most in need.

**Social Safety Nets:** By offering support mechanisms, the approach helps protect individuals from economic hardships and social risks. This safety net can prevent people from falling deeper into poverty and help them achieve a basic standard of living.

## 3. Government and Institutional Role:

**Government Responsibility:** The Welfare Approach often involves a significant role for the government in providing and managing welfare programs. Governments are responsible for designing policies, administering benefits, and ensuring that assistance reaches the intended beneficiaries.

**Institutional Support:** Various institutions, including nongovernmental organisations (NGOs) and charitable organisations, play a crucial role in delivering welfare services and support. These organisations often work alongside government agencies to provide comprehensive assistance.

## 4. Focus on Immediate Needs:

**ShortTerm Relief:** The Welfare Approach is primarily concerned with addressing immediate and shortterm needs rather than longterm development. It aims to provide quick relief and support to individuals facing urgent challenges.

**Emergency Assistance:** In times of crisis, such as natural disasters or economic downturns, welfare programs offer emergency assistance to help affected individuals and communities recover.

## 5. Criticisms and Limitations:

**Dependency:** One criticism of the Welfare Approach is that it may lead to dependency on aid rather than encouraging self sufficiency and economic independence. Critics argue that providing direct support without accompanying opportunities for employment and development can create a cycle of reliance.

**Limited Impact on Systemic Issues:** The approach may not fully address the underlying causes of poverty and inequality. While it provides essential support, it might not tackle structural issues such as lack of education, job opportunities, or systemic discrimination.

## 6. Integration with Other Approaches:

**Complementary Strategies:** The Welfare Approach is often integrated with other development strategies, such as the Basic Needs Approach or Capability Approach. Combining welfare support with initiatives aimed at education, employment, and empowerment can enhance overall development outcomes.

### **Q.22. (a) Explain the main features of 'Clustered Settlements' in India.**

**Solution.** Clustered Settlements are a type of settlement pattern where houses and buildings are grouped closely together, often around a central point. This pattern is commonly found in rural areas and has distinct features in India. Here are the main features:

#### 1. Dense Aggregation:

In clustered settlements, homes and other buildings are closely packed together. The layout typically forms a compact group rather than being spread out. This density allows for efficient use of land, which can be beneficial in areas with limited space.



## 2. Central Focus:

Clustered settlements often have a central focal point, such as a village square, market, or a place of worship. This central area serves as the hub of community activities and services, making it easier for residents to access amenities and interact with one another.

## 3. Efficient Land Use:

By concentrating buildings in a specific area, clustered settlements make efficient use of land. This can be advantageous in areas where agricultural land needs to be preserved or where topography restricts the spread of settlements.

## 4. CloseKnit Community:

The proximity of homes fosters a strong sense of community. Neighbours are close to each other, which can enhance social interactions and mutual support. This close knit nature often results in strong local networks and communal activities.

## 5. Shared Resources:

Residents in clustered settlements often share resources and infrastructure. For example, they might use common wells, communal toilets, or shared roads. This shared use can reduce individual costs and facilitate maintenance.

## 6. Traditional and Cultural Aspects:

In many parts of India, clustered settlements reflect traditional and cultural practices. For example, in some regions, settlements are organised around a central temple or community centre, which plays a crucial role in local cultural and religious life.

## 7. Adaptation to Local Conditions:

The pattern of clustered settlements often adapts to local geographical and environmental conditions. For instance, in hilly or uneven terrain, building clusters can be more practical than spreading out, as it minimizes the need for extensive infrastructure.

## 8. Historical and Social Significance:

Clustered settlements are sometimes historical in nature, having evolved over centuries. They often reflect historical patterns of land use, social organization, and settlement evolution. In some cases, these settlements have cultural or historical significance that influences their structure and layout.

## 9. Challenges and Issues:

While clustered settlements have their benefits, they can also face challenges. For example, the density can lead to overcrowding and strain on shared resources. Additionally, infrastructure and sanitation might need to be upgraded to accommodate growing populations.

### Examples in India:

**Traditional Villages:** Many traditional Indian villages, particularly in rural areas, follow a clustered pattern. These villages often have a central area with houses and communal buildings clustered around it.

**Historical Settlements:** Ancient settlements, like those in the Indus Valley Civilization, show evidence of clustered settlement patterns. These early settlements were organized in a way that maximized land use and supported community life.

**OR**

**(b) Explain the main features of Dispersed Settlements' in India.**

**Solution.** Dispersed Settlements are characterized by a pattern where homes and buildings are spread out over a large area rather than being concentrated in one place. This pattern is common in various parts of India and has several distinct features:

### 1. SpreadOut Layout:

In dispersed settlements, individual houses and buildings are located at considerable distances from each other. This spreadout arrangement

means that the settlement covers a larger area compared to clustered settlements.

## 2. Agricultural Focus:

Dispersed settlements are often found in areas where agriculture is the primary occupation. Farmers live in scattered homesteads throughout their fields, which allows them to be close to their work and manage their agricultural activities more effectively.

## 3. Limited Centralization:

Unlike clustered settlements, dispersed settlements lack a central focal point or village centre. Instead, services and facilities are more spread out, and there may be no single central area where community activities are concentrated.

## 4. Low Density:

The population density in dispersed settlements is generally low because homes are spread out over a wide area. This low density can contribute to a more peaceful and less congested living environment.

## 5. SelfSufficiency:

Residents in dispersed settlements often rely on their own resources and facilities. Each household may have its own water supply, sanitation facilities, and sometimes even its own small scale agricultural operations.

## 6. Adaptation to Terrain:

Dispersed settlements are often found in areas with specific geographical or environmental conditions that make a clustered pattern impractical. For example, hilly or mountainous terrain may be more suitable for dispersed settlement due to the uneven land.

## 7. Limited Infrastructure:

Due to the scattered nature of these settlements, infrastructure such as roads, schools, and healthcare facilities may be less developed compared

to clustered areas. This can result in residents having to travel longer distances to access services.

#### 8. Environmental Impact:

The spread out nature of dispersed settlements can lead to less environmental impact on the land compared to dense urban areas. However, it can also lead to challenges related to the management of resources and infrastructure.

#### 9. Historical and Cultural Factors:

In some regions, dispersed settlements reflect historical land use patterns and cultural practices. For example, in areas where land was traditionally divided among families, dispersed living arrangements can be a result of these historical practices.

#### Examples in India:

**Rural Areas:** Many rural areas in India, particularly those engaged in agriculture, feature dispersed settlements. Farmers live in scattered homes across their fields to be close to their agricultural work.

**Hilly and Forested Regions:** Dispersed settlements are also common in hilly or forested regions where terrain and natural resources dictate a more spreadout pattern of habitation.

### **Q.23. Examine the potential of Solar Energy in India.**

**Solution.** Solar Energy has significant potential in India, given its vast sunlight exposure and growing energy demands. Here's an examination of its potential in the Indian context:

#### 1. Abundant Solar Resources:

**High Solar Irradiance:** India receives ample sunlight throughout the year, with an average of about 300 sunny days annually. This makes it an ideal location for harnessing solar energy.

**Geographical Advantage:** The country's geographic location, especially in the northern and western parts, provides high solar irradiance levels. States like Rajasthan, Gujarat, and parts of Maharashtra receive some of the highest solar radiation in the country.

## 2. Growing Energy Needs:

**Increasing Demand:** India's energy consumption is rising rapidly due to economic growth, urbanisation, and industrialization. Solar energy can help meet this growing demand in a sustainable manner.

**Energy Access:** Solar energy can be particularly beneficial for remote and rural areas where extending the grid is challenging and costly. Offgrid solar solutions can provide electricity to underserved communities, improving energy access and quality of life.

## 3. Environmental Benefits:

**Reduction in Carbon Emissions:** Solar power is a clean energy source that reduces reliance on fossil fuels. This helps lower carbon emissions and mitigates climate change impacts.

**Sustainable Development:** By investing in solar energy, India can move towards more sustainable energy practices, supporting its commitments to global climate agreements like the Paris Agreement.

## 4. Technological Advancements:

**Cost Reductions:** Technological advancements and economies of scale have significantly reduced the cost of solar panels and related technologies. This makes solar energy more affordable and competitive with traditional energy sources.

**Innovation:** India is also making strides in solar technology, including innovations in photovoltaic cells, solar thermal systems, and energy

storage solutions. These advancements enhance the efficiency and reliability of solar power systems.

#### 5. Government Initiatives:

**Policy Support:** The Indian government has implemented various policies and schemes to promote solar energy. For example, the National Solar Mission aims to install 100 GW of solar power capacity by 2030.

**Subsidies and Incentives:** There are financial incentives, subsidies, and tax benefits available for both residential and commercial solar installations, encouraging widespread adoption.

#### 6. Economic Opportunities:

**Job Creation:** The solar energy sector has the potential to create numerous jobs in manufacturing, installation, maintenance, and research. This contributes to economic development and skillbuilding.

**Investment Potential:** Solar energy attracts domestic and international investments, fostering growth in related industries and infrastructure development.

#### 7. Challenges and Considerations:

**Intermittency:** Solar energy is intermittent, as it depends on sunlight availability. This requires effective energy storage solutions and grid management to ensure a consistent power supply.

**Initial Costs:** While the costs of solar technology have decreased, the initial investment for installation and infrastructure can still be substantial. Financing options and incentives help mitigate this challenge.

Land Use: Large scale solar installations require significant land area, which can impact land use and ecosystems. Careful planning and site selection are needed to address these concerns.

## SECTION D

Questions number 24 to 28 are Long Answer Type Questions.

**24. (a) Explain the main features of 'Primitive Subsistence Agriculture' in the world.**

**Solution.** Primitive Subsistence Agriculture is a traditional farming method practised in various parts of the world. It involves basic, low intensity agricultural practices aimed at producing enough food for the farmer's family, rather than for sale or trade. Here are the main features:

1. Low Technological Input:

Primitive subsistence agriculture relies on traditional farming techniques with minimal use of modern technology. Tools are often simple, such as hand hoes, sickles, and basic ploughs, rather than advanced machinery.

2. Reliance on Natural Resources:

Farmers depend heavily on natural resources and environmental conditions. This type of agriculture typically makes use of the natural fertility of the soil and local climate without the extensive use of artificial fertilisers or pesticides.

3. Shifting Cultivation:

A common practice in primitive subsistence agriculture is shifting cultivation, also known as slash and burn agriculture. Farmers clear a plot of forest or bushland by cutting and burning the vegetation, which provides nutrients for the soil. After a few years, the soil's fertility diminishes, and farmers move to a new area, allowing the original plot to regenerate.

4. Low Yields and Diversity:

The yields from primitive subsistence agriculture are generally low compared to modern farming practices. To maximize the use of available land and resources, farmers often grow a variety of crops and raise some livestock. This diversity helps to ensure food security and reduce the risk of crop failure.

#### 5. Subsistence Orientation:

The primary goal of primitive subsistence agriculture is to produce enough food to meet the needs of the farmer's family. Surplus production is minimal, and there is often little or no involvement in market trade.

#### 6. Minimal External Inputs:

Farmers typically do not use external inputs such as synthetic fertilizers, herbicides, or pesticides. Instead, they rely on organic methods, such as composting and natural pest control, to manage soil fertility and crop health.

#### 7. LabourIntensive:

This type of agriculture is laborintensive, requiring significant physical effort from farmers. Activities such as clearing land, planting, weeding, and harvesting are usually done manually.

#### 8. Traditional Knowledge and Practices:

Farmers use traditional knowledge passed down through generations. This knowledge includes understanding local soil types, weather patterns, and crop varieties, as well as cultural practices and rituals related to agriculture.

#### 9. Seasonal and Local Variations:

Primitive subsistence agriculture is highly adapted to local environmental conditions and seasonal changes. Farming practices and crop choices vary according to the specific climate, soil, and ecological conditions of the region.

#### 10. Social and Cultural Significance:



Agricultural practices in primitive subsistence farming often have strong social and cultural significance. They are closely tied to community traditions, rituals, and social structures.

Examples Around the World:

**SlashandBurn Farming:** Common in the Amazon Basin, parts of Africa, and Southeast Asia. Farmers clear small plots of forest land and use the ashes to enrich the soil temporarily.

**Rice Cultivation:** In some areas of Asia, farmers use traditional methods of rice cultivation, including hand planting and harvesting.

**Milpa System:** Practiced in Central America, where farmers rotate crops such as maize, beans, and squash on the same plot of land.

**OR (b) Explain the main features of 'Commercial Livestock Rearing' in the world.**

**Solution.** Commercial Livestock Rearing is a form of farming focused on raising animals for the primary purpose of selling their products, such as meat, milk, wool, or hides. This method is characterized by several key features:

1. **HighVolume Production:**

Commercial livestock rearing is oriented towards highvolume production. The goal is to maximize output and efficiency, producing large quantities of animal products for market sale. This often involves managing large herds or flocks to achieve economies of scale.

2. **Specialized Breeds:**

Farmers use specialized breeds of livestock that are known for their high productivity and efficiency. For example, dairy farms might use breeds like Holsteins or Jerseys, which are renowned for their milk production, while

beef farms might choose breeds like Angus or Hereford for their meat quality.

### 3. Advanced Technology and Infrastructure:

Commercial operations often employ advanced technology and infrastructure to optimize production. This includes modern facilities such as automated feeding systems, climatecontrolled barns, and advanced veterinary care. Technology also helps in tracking animal health and performance.

### 4. Intensive Farming Practices:

This type of livestock rearing frequently involves intensive farming practices. Animals are kept in confined spaces or controlled environments to maximize their growth and productivity. For instance, feedlots are used for fattening cattle before slaughter, and poultry farms may use battery cages for egg production.

### 5. Feed and Nutrition Management:

Commercial livestock operations carefully manage animal diets to ensure optimal growth and productivity. This involves using specially formulated feed that meets the nutritional needs of the livestock. In many cases, feed is supplemented with vitamins, minerals, and other additives to enhance animal health and performance.

### 6. Disease Management and Veterinary Care:

Maintaining animal health is critical in commercial livestock rearing. Farmers invest in regular veterinary care and disease management practices to prevent and control outbreaks. This includes vaccination programs, parasite control, and routine health checks.

### 7. Efficient Waste Management:

Large Scale livestock operations produce significant amounts of waste. Efficient waste management systems are essential to handle manure and other byproducts. This might involve recycling manure as fertilizer, using

anaerobic digesters to produce biogas, or employing proper disposal methods to minimise environmental impact.

#### 8. Market Orientation:

The focus of commercial livestock rearing is market driven. Farmers produce livestock products to meet consumer demand and market trends. This requires understanding market prices, consumer preferences, and often involves direct sales to processors or retailers.

#### 9. Environmental and Ethical Considerations:

Commercial livestock rearing can have significant environmental impacts, including land degradation, water usage, and greenhouse gas emissions. There is also ongoing debate about animal welfare and ethical treatment. Many commercial operations are working to address these issues through sustainable practices and improved animal welfare standards.

#### 10. Global Examples:

**Beef Production:** In countries like the United States, Brazil, and Australia, large scale beef operations involve extensive ranches or feedlots where cattle are raised for meat production.

**Dairy Farming:** In regions such as Europe, the United States, and New Zealand, dairy farms use advanced technology to produce large quantities of milk and dairy products.

**Poultry Farming:** Countries like China, the United States, and Brazil have extensive commercial poultry operations, raising chickens for meat (broilers) and eggs, often in controlled environments.

**Q.25. Analyse the main characteristics of large scale manufacturing industries in the world.**

**Solution.** Largescale manufacturing industries are characterized by several key features that distinguish them from smaller or artisanal operations. These industries play a significant role in the global economy and are involved in the production of a wide range of goods. Here's an analysis of their main characteristics:

1. High Production Volume:

Largescale manufacturing industries focus on producing goods in high volumes. This often involves mass production techniques that allow for the efficient and consistent creation of large quantities of products. For example, automotive manufacturers produce thousands of vehicles each day using assembly lines.

2. Advanced Technology and Machinery:

These industries heavily rely on advanced technology and machinery. Automated production lines, robotics, and sophisticated machinery are commonly used to enhance efficiency, precision, and productivity. This technology helps in maintaining consistent product quality and reducing labour costs.

3. Economies of Scale:

Large Scale manufacturing benefits from economies of scale. This means that as production volume increases, the cost per unit of production decreases. Large Scale operations can spread fixed costs, such as machinery and infrastructure, over a greater number of units, making each unit cheaper to produce.

4. Specialised Workforce:

These industries employ a specialised workforce with skills tailored to specific aspects of the manufacturing process. This includes engineers, machine operators, quality control specialists, and maintenance staff. Training and expertise are crucial for operating complex machinery and ensuring high production standards.

5. Standardised Production Processes:

Standardisation is a key feature of large scale manufacturing. Production processes are designed to be uniform and repeatable, ensuring that each product meets the same specifications and quality standards. This standardisation helps in achieving consistency and reliability across large production runs.

#### 6. Integrated Supply Chains:

Large Scale manufacturing industries often operate within integrated supply chains. They source raw materials and components from various suppliers and manage logistics to ensure a steady flow of inputs. Efficient supply chain management is crucial for maintaining production schedules and minimising disruptions.

#### 7. Significant Capital Investment:

Establishing and maintaining large scale manufacturing operations requires substantial capital investment. This includes costs for acquiring land, constructing facilities, purchasing machinery, and implementing technology. The high capital requirement is a barrier to entry for many potential competitors.

#### 8. Focus on Research and Development (R&D):

To stay competitive and innovate, large scale manufacturers invest in research and development. R&D activities focus on improving products, developing new technologies, and enhancing manufacturing processes. This investment helps in maintaining market leadership and responding to changing consumer demands.

#### 9. Environmental and Regulatory Compliance:

Large Scale manufacturing industries are subject to environmental regulations and standards. They must comply with laws related to waste management, emissions control, and resource usage. Many industries are adopting sustainable practices to reduce their environmental impact and meet regulatory requirements.

#### 10. Global Reach and Market Penetration:

Many largescale manufacturing companies operate globally, with production facilities, distribution networks, and market presence in multiple countries. This global reach allows them to access diverse markets, optimize production locations, and leverage international trade opportunities.

Examples:

**Automotive Industry:** Companies like Toyota, Ford, and Volkswagen operate large scale manufacturing plants that produce millions of vehicles annually. These facilities use advanced assembly lines and robotics to ensure high production efficiency.

**Electronics Industry:** Companies like Samsung and Apple run large scale operations to produce electronic devices such as smartphones, tablets, and computers. These industries invest heavily in technology and R&D to drive innovation.

**Food and Beverage Industry:** Firms like Nestlé and CocaCola have large scale manufacturing plants that produce packaged food and beverages for global markets. They use automated processes to handle high production volumes and maintain product consistency.

**Q.26. "International trade can prove to be detrimental to nations if it leads to dependence on the other countries." Justify the statement.**

**Solution.** International trade is a critical component of the global economy, offering countries access to goods, services, and resources that they may not produce domestically. However, when international trade leads to excessive dependence on other countries, it can pose several risks and challenges. Here's why dependence on other countries through international trade can be detrimental:

1. Economic Vulnerability:

**Market Fluctuations:** Dependence on imports for essential goods, such as oil or raw materials, makes a country vulnerable to fluctuations in global markets. For instance, if a country relies heavily on imported oil and global oil prices rise suddenly, the cost of imports increases, which can lead to inflation and economic instability.

**Supply Chain Disruptions:** Disruptions in supply chains due to political instability, natural disasters, or trade conflicts in exporting countries can severely impact dependent nations. For example, a country relying on a single source for critical components might face production halts if there are issues in the exporting country.

## 2. Loss of Economic Independence:

**Limited Policy Flexibility:** Heavy reliance on foreign trade can limit a country's ability to implement independent economic policies. For instance, if a country depends on exports to a particular market, it might be pressured to align its policies with the preferences of that market to maintain access and avoid trade barriers.

**Economic Influence:** Countries that are major suppliers of essential goods or services can exert significant influence over dependent nations. This influence can translate into economic or political leverage, which might be used to the detriment of the dependent country's interests.

## 3. Trade Imbalances:

**Trade Deficits:** If a country imports more than it exports, it runs a trade deficit. Persistent trade deficits can lead to a depletion of foreign exchange reserves and increase the national debt. A country heavily dependent on imports might struggle to balance its trade accounts, leading to longterm economic challenges.

**Economic Imbalances:** Dependence on foreign markets can also lead to economic imbalances. For example, if a country relies heavily on exporting raw materials while importing finished goods, it might miss out on the higher value-added benefits of manufacturing and innovation.

#### 4. Impact on Local Industries:

**Competition:** International trade can expose domestic industries to intense competition from foreign companies. If local businesses cannot compete with cheaper or better-quality foreign products, they may struggle, leading to job losses and economic downturns in affected sectors.

**Market Displacement:** Dependence on foreign goods can sometimes lead to the displacement of local industries. For example, if a country relies on imported textiles, its domestic textile industry might struggle to survive, reducing local production and innovation in that sector.

#### 5. Geopolitical Risks:

**Political Tensions:** Dependence on trade with specific countries can lead to geopolitical risks. Political tensions or conflicts between nations can disrupt trade relations, affecting the availability of critical resources and leading to economic instability.

**Economic Sanctions:** Countries that are heavily dependent on trade with a particular nation might be more vulnerable to economic sanctions or trade restrictions imposed by that nation. This can have severe repercussions on the dependent country's economy and trade balance.

#### Examples:

**Oil Dependency:** Many countries, such as Japan and South Korea, rely heavily on oil imports. Fluctuations in oil prices or geopolitical tensions in oil-producing regions can significantly impact their economies.



China's Influence: Countries heavily dependent on trade with China, such as those exporting raw materials or manufacturing goods, might face challenges if trade relations with China become strained.

**Q.27. How does the highly uneven spatial distribution of the population in India suggest its close relationship with physical, social, economic and historical factors? Analyse with examples.**

**Solution.** The highly uneven spatial distribution of India's population reflects a complex interplay of physical, social, economic, and historical factors. Here's how these factors contribute to the population distribution, with examples to illustrate each aspect:

### 1. Physical Factors:

Geography and Terrain:

Ganges Plain: The fertile Ganges Plain, which includes states like Uttar Pradesh and Bihar, has one of the highest population densities in India. The rich alluvial soil and abundant water resources make it ideal for agriculture, supporting a large population.

Himalayas: In contrast, the rugged terrain of the Himalayan region, including parts of Jammu and Kashmir, Himachal Pradesh, and Uttarakhand, has sparse population settlements. The difficult terrain and harsh climatic conditions limit agricultural activities and urban development.

Climate:

Tropical South: The southern states like Kerala and Tamil Nadu, which enjoy a more moderate tropical climate, tend to have higher population densities compared to regions with extreme temperatures.

Desert Regions: The Thar Desert in Rajasthan has a low population density due to its arid conditions and scarce water resources.

### 2. Social Factors:

Cultural and Historical Significance:

**Historical Urban Centers:** Cities with historical significance and cultural heritage, such as Delhi, Mumbai, and Kolkata, attract large populations due to their historical, political, and economic importance. These cities have developed into major urban centers over time, attracting people from various regions.

**Migration Patterns:** Social factors like migration for education, employment, and better living standards contribute to population concentration in metropolitan areas. For example, Bangalore and Hyderabad have seen substantial population growth due to their status as IT hubs.

**Social Services and Infrastructure:**

**Urban vs. Rural Areas:** Access to better healthcare, education, and infrastructure in urban areas leads to higher population densities in cities compared to rural areas. For instance, cities like Chennai and Pune have welldeveloped infrastructure, making them attractive places to live.

### 3. Economic Factors:

**Economic Opportunities:**

**Industrial and Commercial Hubs:** Economic opportunities significantly influence population distribution. Cities such as Mumbai, which is the financial capital, and Gurgaon, which is a major IT and business hub, attract large populations due to job opportunities and economic growth.

**Agricultural Regions:** Areas with fertile land and irrigation facilities, such as Punjab and Haryana, support large rural populations engaged in agriculture.

**Development and Employment:**

**Industrialization:** Regions with significant industrial development, such as the industrial belts in Maharashtra and Gujarat, tend to have higher population densities. The presence of industries creates employment opportunities, attracting people from less developed regions.

### 4. Historical Factors:

### Colonial Legacy:

**Urban Development:** During British rule, certain cities like Mumbai, Kolkata, and Chennai were developed as major ports and administrative centers, leading to their rapid growth. This historical development laid the foundation for high population densities in these urban areas.

### Historical Migration Patterns:

**Settlement Patterns:** Historical migration patterns, such as the movement of people during and after major events (e.g., partition), have influenced population distribution. The migration of people during the partition of India led to population concentration in certain regions of the newly formed states.

### Examples:

**Delhi and Mumbai:** High population densities in these cities are a result of their historical significance, economic opportunities, and advanced infrastructure. Delhi, as the capital, and Mumbai, as the financial capital, attract people from across the country.

**Himalayan States:** States like Himachal Pradesh and Uttarakhand have lower population densities due to challenging geographic conditions and limited economic opportunities.

**Ganges Basin:** The densely populated Ganges Basin, including areas in Uttar Pradesh and Bihar, benefits from fertile alluvial soil, which supports intensive agriculture and sustains a large population.

### **Q.28 (a) Analyse the role of the Indian Railways in the economic development of the country.**

**Solution.** The Indian Railways plays a pivotal role in the economic development of India, functioning as a key infrastructure element that

supports various facets of economic growth. Here's an analysis of its contributions:

### 1. Facilitates Movement of Goods:

**Economic Integration:** Indian Railways is crucial in linking different regions of India, facilitating the movement of raw materials, finished products, and agricultural produce. For instance, it enables the transportation of coal from mines in Jharkhand and Chhattisgarh to power plants in other regions, which is essential for energy production.

**Cost Effective Transport:** Rail transport is often more cost effective for bulk goods compared to road transport. It helps reduce logistics costs for industries, improving the competitiveness of Indian products in both domestic and international markets.

### 2. Promotes Regional Development:

**Connectivity to Remote Areas:** Railways enhance connectivity to remote and underserved regions, promoting economic development in these areas. For example, the expansion of rail networks into northeastern states and remote regions like Ladakh helps integrate these areas into the national economy.

**Development of Industrial Hubs:** The establishment of railways has been instrumental in the growth of industrial hubs. Regions like Jamshedpur and Bhilai have developed around major railway hubs, benefiting from improved transport and logistics.

### 3. Stimulates Economic Activities:

**Employment Generation:** Indian Railways is one of the largest employers in India, providing jobs to millions of people. This employment supports local economies and generates income for countless families.

**Support for Small Businesses:** The railway network supports small businesses and traders by providing reliable and affordable transportation for their goods. This connectivity enables these businesses to access broader markets and expand their operations.

#### 4. Enhances Tourism and Commerce:

**Tourism Boost:** The Indian Railways network supports tourism by providing access to popular destinations. Special trains like the Palace on Wheels and the Himalayan Queen attract tourists, boosting local economies and creating opportunities in the hospitality sector.

**Commerce Facilitation:** By connecting major commercial centers, railways facilitate trade and commerce. Cities like Mumbai, Delhi, and Kolkata benefit from enhanced access to markets across the country, fostering economic activity and growth.

#### 5. Reduces Traffic Congestion:

**Alternative to Road Transport:** By shifting a significant volume of cargo from roads to railways, Indian Railways helps alleviate traffic congestion and reduces the wear and tear on road infrastructure. This contributes to overall efficiency in the transportation sector.

#### 6. Supports Agricultural Development:

**Market Access for Farmers:** Railways provide farmers with a means to transport their produce from rural areas to urban markets. This access helps stabilize prices and reduces the risk of spoilage, benefiting agricultural communities.

**Cold Storage Facilities:** Some railway stations offer cold storage facilities, which help preserve perishable goods during transit, ensuring that agricultural products reach markets in good condition.

## 7. Infrastructure Development:

**Investment in Infrastructure:** The development of railway infrastructure, including tracks, stations, and freight terminals, stimulates investment in associated sectors such as construction and manufacturing. This infrastructure development contributes to overall economic growth.

Examples:

**Dedicated Freight Corridors:** The introduction of Dedicated Freight Corridors (DFC) aims to improve the efficiency of freight transport by separating passenger and freight services. This initiative enhances the capacity and speed of goods movement, supporting industrial growth.

**Metro Projects:** Urban metro rail projects in cities like Delhi, Mumbai, and Bangalore reduce congestion, improve urban mobility, and boost economic activity in metropolitan areas by providing efficient public transportation.

**OR (b) Analyse the role of metalled roads in the economic development of India.**

**Solution.** Metalled roads, or paved roads, play a crucial role in India's economic development by enhancing connectivity, supporting various industries, and improving overall quality of life. Here's an analysis of their significance:

### 1. Enhancing Connectivity and Accessibility:

**Linking Rural and Urban Areas:**

**Economic Integration:** Metalled roads connect rural areas with urban centers, facilitating the movement of goods, services, and people. This integration is vital for economic growth as it allows rural areas to access markets, education, and healthcare facilities.

Example: The Pradhan Mantri Gram Sadak Yojana (PMGSY) focuses on improving road connectivity in rural areas, which helps integrate remote villages into the national economy.

#### Improved Transportation Network:

**Efficiency in Movement:** Paved roads reduce travel time and vehicle operating costs compared to unpaved roads. This efficiency supports economic activities by allowing faster and more reliable transportation of goods and passengers.

Example: The National Highway network, including major routes like NH 44 and NH 2, facilitates longdistance travel and trade across states, contributing to economic integration.

## 2. Supporting Economic Activities:

#### Boosting Trade and Commerce:

**Facilitating Trade:** Metalled roads support the movement of commercial goods, enhancing trade within the country and with neighboring nations. This connectivity helps businesses reach broader markets and reduces transportation costs.

Example: The Golden Quadrilateral project, which connects major cities like Delhi, Mumbai, Chennai, and Kolkata, significantly boosts interstate trade and commerce.

#### Encouraging Investment:

**Attracting Businesses:** Reliable road infrastructure attracts investments by improving access to industrial and commercial areas. It also supports the growth of industrial hubs and economic zones.

Example: The development of industrial corridors like the DelhiMumbai Industrial Corridor (DMIC) is supported by metalled roads that facilitate the movement of raw materials and finished products.

## 3. Enhancing Agricultural Development:

#### Market Access for Farmers:

**Transporting Produce:** Paved roads enable farmers to transport their produce efficiently to urban markets, reducing postharvest losses and ensuring better prices for their goods.

**Example:** The construction of metalled roads in agricultural regions like Punjab and Haryana has improved market access for farmers, supporting the agricultural economy.

**Reducing Isolation:**

**Access to Services:** Improved road infrastructure helps farmers access essential services such as fertilisers, seeds, and agricultural equipment, contributing to increased productivity and economic stability.

**Example:** In states like Uttar Pradesh and Madhya Pradesh, metalled roads have improved access to agricultural support services and markets.

#### 4. Supporting Social and Economic Development:

**Improving Quality of Life:**

**Access to Services:** Metalled roads enhance access to essential services such as education, healthcare, and government facilities, contributing to the overall quality of life in both rural and urban areas.

**Example:** In remote areas of Himachal Pradesh and Uttarakhand, paved roads have improved access to schools and hospitals, benefiting local communities.

**Stimulating Regional Development:**

**Urbanization and Growth:** The development of metalled roads supports urbanization by connecting towns and cities, leading to the growth of new commercial and residential areas.

**Example:** The expansion of road networks in cities like Bangalore and Hyderabad has supported their growth as major IT and business hubs.

#### 5. Reducing Transportation Costs and Improving Safety:

**Lower Vehicle Operating Costs:**



Efficiency Gains: Paved roads reduce vehicle wear and tear and fuel consumption, lowering overall transportation costs for individuals and businesses.

Example: The improvement of highways and state roads has led to reduced transportation costs for logistics companies, benefiting the broader economy.

#### Safety Improvements:

Accident Reduction: Metalled roads, with proper design and maintenance, improve road safety by reducing accidents caused by poor road conditions.

Example: Enhanced road safety measures and improved road conditions on national highways have contributed to a reduction in road accidents.