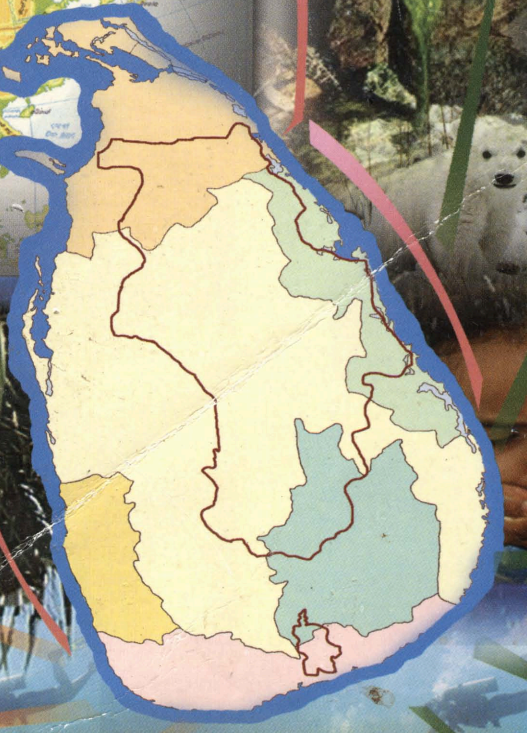
Geography

Grade 9



Educational Publications Department

GEOGRAPHY

Grade 9

Prepared and Published by

Educational Publications Department

First Published - 2009

Second Published - 2010

The Government has spent Rs. 251.00 for this book which is presented to you free.

Published by Educational Publications Department
Printed by Savinda Graphic Systems (Pvt) Ltd, No. 145, UDA Industrial Estate,
Katuwana Road, Homagama.

National Anthem of Sri Lanka

Sri Lanka Matha

Apa Sri Lanka Namo Namo Namo Namo Matha

Sundara siri barinee, surandi athi soba mana Lanka

Dhanya dhanaya neka mal palaturu piri jaya bhoomiya ramya

Apa hata sapa siri setha sadana jeewanaye matha

Piliganu mana apa bhakthi pooja Namo Namo Matha

Apa Sri Lanka Namo Namo Namo Namo Matha

Oba we apa vidya

Obamaya apa sathya

Oba we apa shakthi

Apa hada thula bhakthi

Oba apa aloke

Apage anuprane

Oba apa jeevana we

Apa mukthiya oba we

Nava jeewana demine, nithina apa pubudukaran matha

Gnana veerya vadawamina ragena yanu mana jaya bhoomi kara

Eka mavakage daru kala bavina

Yamu yamu vee nopama

Prema vada sama bheda durarada

Namo, Namo Matha

Apa Sri Lanka Namo Namo Namo Namo Matha

අපි වෙමු එක මවකගේ දරුවෝ
එක නිවසෙහි වෙසෙනා
එක පාටැති එක රුධිරය වේ
අප කය තුළ දුවනා

එබැවිනි අපි වෙමු සොයුරු සොයුරියෝ
එක ලෙස එහි වැඩෙනා
ජීවත් වන අප මෙම නිවසේ
සොඳින සිටිය යුතු වේ.

සැමට ම මෙත් කරුණා ගුණෙනී
වෙළී සමගි දමිනී
රන් මිණි මුතු නොව එය මය සැපතා
කිසි කල නොම දිරනා

- ආනන්ද සමරකෝන් -

ஒரு தாய் மக்கள் நாமாவோம்
ஒன்றே நாம் வாழுமில்லம்
நன்றே உடலில் ஓடும்
ஒன்றே நம் குருதி நிறம்.

அதனால் சகோதரர் நாமாவோம்
ஒன்றாய் வாழும் வளரும் நாம்
நன்றாய் இவ் இல்லினிலே
நலமே வாழ்தல் வேண்டுமன்றோ.

யாவரும் அன்பு கருணையுடன்
ஒற்றுமை சிறக்க வாழ்ந்திடுதல்
பொன்னும் மணியும் முத்துமல்ல - அதுவே
யான்று மழியாச் செல்வமன்றோ.

- ஆனந்த சமரக்கோன் -
கவிதையின் பெயர்ப்பு

The Message of His Excellency the President

Beloved Sons and Daughters,

Many countries that lagged behind us at the time we gained independence have now passed us and gone far ahead. But, we must not be prepared to copy those countries or work according to the development models of those nations. Similarly, there is no purpose in continuing to lament about our lost heritage. What we shall do instead is to surpass them and reach a stage of overall development they have not reached, and show new paths and possibilities to the world.

Dear Sons and Daughters, we are now engaged in building your future !

Mahinda Rajapaksa
President of the Democratic Socialist Republic of Sri Lanka

(An extract from the speech delivered by President Mahinda Rajapaksa at the historic Water Filling Ceremony of the Magampura Port on 15.08.2010)

FOREWORD

The mission of education is to provide for the future and to ensure that the younger generation can grow up as citizens able to face the challenges of the future with confidence. The changes instituted in the grade nine school curriculum with these objectives in mind came into effect in 2010. This textbook is a reprint of it.

As the government has to disburse an unbearable amount of its revenue on free textbooks, it is your duty to make the maximum use of this textbook and protect it well so that it can be reused. Then you can be proud that you have added your mite to the national assets.

I wish to take this opportunity to thank the writers, the editors, the members of the evaluation boards, the officers of the Educational Publications Department and all the others who have contributed to the compilation of this book.

W.M.N.J.Pushpakumara
Commissioner General of Educational publications

Educational Publications Department
"Isurupaya,"
Battaramulla.
13.05.2010

Monitoring and Supervision

Mr. W.M.N.J. Pushpakumara - Commissioner General of Educational Publications Department

Direction

Mrs. W.D.P. Nalika - Additional Commissioner (Development) Educational Publications Department

Co-ordination

Mrs. R.A.D.N. Rupasinghe - Deputy Commissioner
- Educational Publications Department

Mr. I. Ranjith - Assistant Commissioner
- Educational Publications Department

Panel of Writers

1.Chairperson - Professor M.D.C. Abhayaratne (retired) University of Sri Jayewardenepura

2. Mrs. R.A.D.N.Rupasinghe - Deputy Commissioner

3. Mr. R. K. L. M. Dharmasiri - Senior Lecturer (Geography) University of Kelaniya

4. Dr. T. M. S. Tennakoon - Senior Lecturer Geography University of Sri Jayewardenepura

5. Mrs. K.S. Padmini Senaratne - Teachers' Service (retired)

6. Mrs.Ranjani Dhanawardana - Chief Project Officer, N.I.E, Maharagama

7. Mrs. N.A. Chitralatha - I.S.A., Zonal Education Office, Matara

8. Mr. R.A. Chandrasiri - I.S.A., Zonal Education Office, Minuwangoda

9. Mrs.W. K.P. Dharmawardena - Teachers' Service,
- St. Peter's College, Negombo

10. Mr. K.S. Somarathne - Teachers' Service, Dharmaraja Vidyalaya, Kandy

11. Mrs. Balasundaram - Deputy Commissioner (retired), Examinations Department

12. Mrs. R. Skandharajah - Principals' Service, St .Anthony's College, Colombo

13. Mr. Abdul Caffur - Teachers' Service, St. Anthony's College, Kandy

14. Mrs. T.S. Rukkahiya - Teachers' Service, Babul Hasan M.M.V., Warakapola

Editor - M. M. Karunanayake Emeritus Professor University of Sri Jayewardenepura,

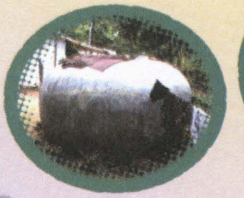
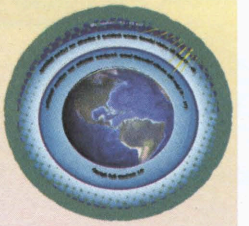
Illustrations and Cover Design - Mrs. A.L. Kokila Chathurani

Final Evaluation - M.M. Karunanayake Emeritus Professor,

Computer Technology - Educational Publications Department

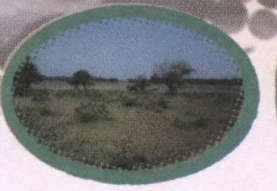
Computer Assistance - Mrs. A.L. Kokila Chathurani
- Miss. Melanthi Disanayake



Contents





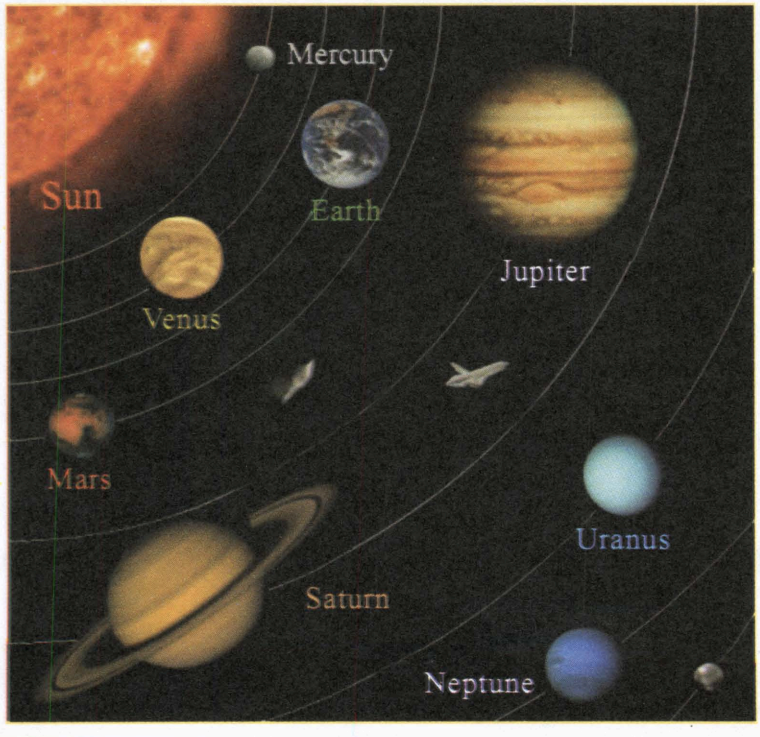

The Blue Planet

The relative location of the Blue Planet in the solar system

The objective of this lesson is to identify the special character of the Blue Planet by examining its nature and processes.

In grade 8 you studied in detail about the solar system and the revolution of the planets around the Sun. Therefore, let us pay attention to certain facts regarding the Blue Planet.

Fig. 1.1 : Location of the Earth in the solar system

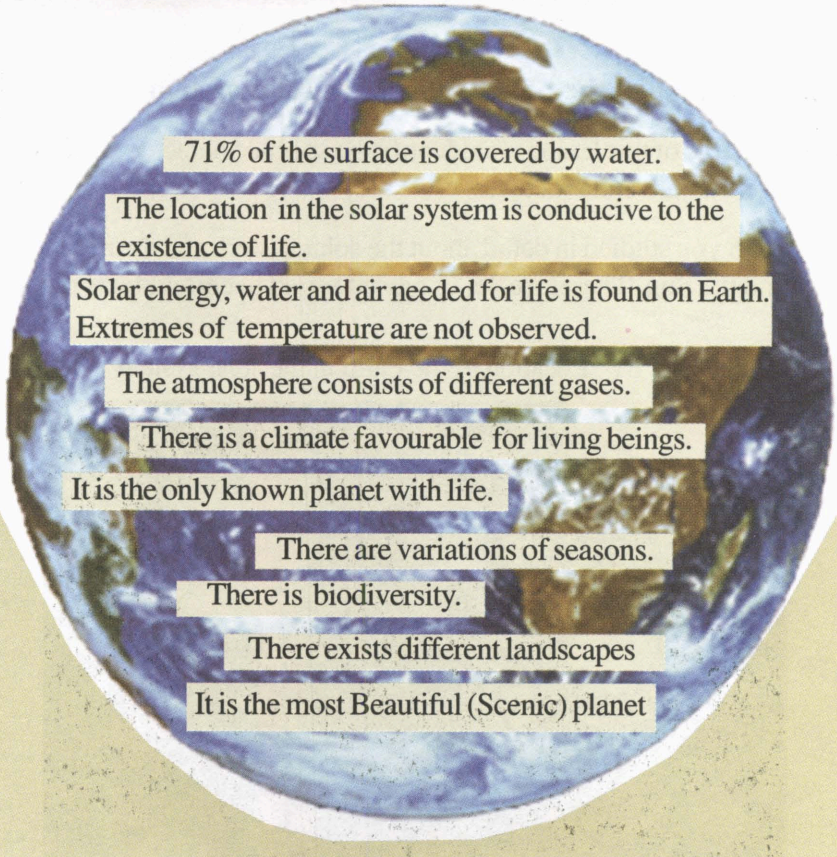


Uniqueness of the Blue Planet

The earth known as the Blue Planet occupies a special place in the solar system which comprises eight planets. Solar energy, water and air that support the existence of life are available on the Earth's surface. The unique nature of the Blue Planet is remarkable as there is no evidence of life in other planets.

Study Fig 1.2 to identify the special features of the Blue Planet.

Fig 1.2 : The Blue Planet



According to the investigations done so far planet Earth is found to be the only planet with life, giving it a unique nature.

Activities

1. Using Fig. 1.2 write three special features of the Blue Planet.
2. Write 3 characteristics of the Blue Planet that help life to survive in it.
3. Write a speech for the morning assembly on the theme "the unique planet in the solar system is our planet – Earth"

For your attention

- The earth is known as the Blue Planet due to a number of factors.
- The clouds around the Earth reflect back sunlight in a more effective way compared to the other planets. Therefore the Earth has its glittering blue colour. Because of this the Earth is called the Blue Planet.
- The Earth is located at a medium distance from the Sun. It is not too close nor too far away from the Sun.
- The Earth rotates around its axis while revolving round the Sun in an elliptical path.
- As a result of the inclination of the Earth's axis by 23 1/2°, in regions within the tropics the Sun is overhead at different times of the year. This results in contrasting seasons over southern and northern hemispheres.

Statistics on the Blue Planet

Distance from the Sun	149.6 million km.
Perihelion	147.2 million km
Aphelion	152.1 million km
Diameter of the Earth	12 756 million km
Duration taken for a rotation	23 hrs & 56 mts
Duration taken for a revolution	365.25 days

(Educational Pulications Department, 1990, Physical Geography - Sinhala.)

The importance of the Blue Planet as the man's habitat

- Presence of a favourable climate due to a combination of factors like solar energy, water and air.
- The presence of an environment favourable for plant growth.
- Presence of power resources.
- Presence of mineral resources for industries.
- The constant interaction between the biotic and non-biotic environments.
- Presence of land favourable for agriculture.
- The existence of biodiversity.

Activity

Describe the importance of the Blue Planet as a human habitat.

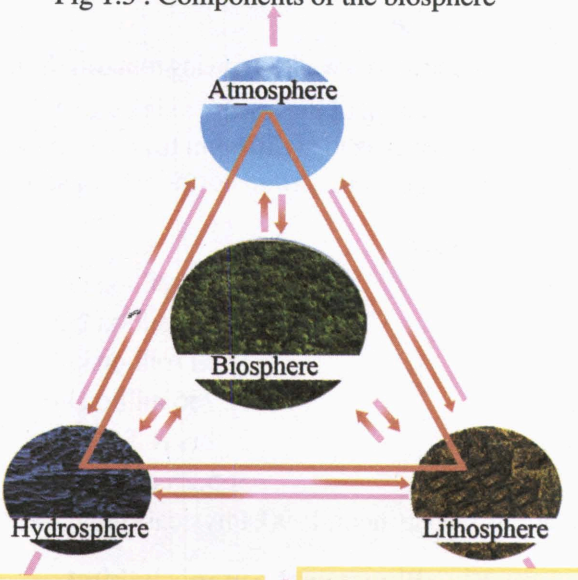
Special features of the Atmosphere, Hydrosphere and the Lithosphere

The existence of fauna and flora over the Blue Planet is the result of its unique characteristics. The interrelationship that exists among the Atmosphere, the Hydrosphere and the Lithosphere is the foundation for the creation of the Biosphere. Now let us identify the special features of these different spheres.

Atmosphere

- It is composed of various gases and water particles.
- Atmosphere consists of 4 layers.
- It extends up to 900-1200 km. from the Earth's surface.
- Interactive processes of the atmosphere result in rainfall.
- Nitrogen , is the predominant gas in the atmosphere.

Fig 1.3 : Components of the biosphere



Hydrosphere

- 71% of the Earth's surface is covered by water.
- It consists of oceans, seas, lakes rivers and streams.
- The Earth is identified as the Blue Planet due to these features .
- Hydrosphere helps in the existence of the Biosphere.
- It affects weather and climate.

Lithosphere

- Lithosphere is the surface layer of the Earth which is composed of different types of rocks.
- Of the Earth's surface 29% consists of the land area.
- Lithosphere is also known as the crust of the Earth.
- Its thickness varies from 10-70 km
- It is characterized by different landscape features.
- It consists of different rocks and minerals.

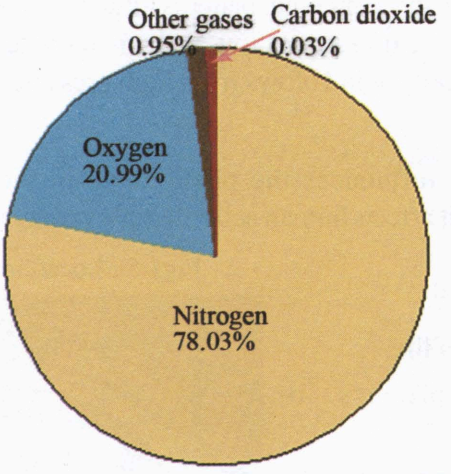
Biosphere

- Consists of the layer where life exists and where various processes are constantly active.
- Both living and non-living phenomena are present.
- There is a biodiversity.
- Consists of numerous eco-systems.

The Atmosphere

The atmosphere is a thin blanket of air around the Earth consisting of different gases. An atmosphere conducive to the existence of life forms prevail only around the Earth. Oxygen which needs for the respiration of the living beings and Nitrogen which is needed for the growth of the plants are included among the gases in the atmosphere. This is a unique feature of the planet Earth.

Fig 1.4: Composition of the Atmosphere



Nitrogen exceeds ¾ of the air content of the atmosphere while oxygen is 1/5 of this content. These two components are 99.02% of the total content. Oxygen is vital for the survival of all living beings. 97% of the atmosphere is restricted to a height of 29 km above sea level.

The atmosphere of the Blue Planet consists of four strata / layers.

- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere

} Ionosphere

Troposphere

It is the most important layer which is closest to the earth. Most of the atmospheric phenomena like temperature, pressure, winds, humidity, formation of clouds and precipitation that affect weather and climatic conditions prevail within this layer.

Depending on altitude for every 100 metres the temperature decreases by 0.64 °C. It is called the lapse rate.

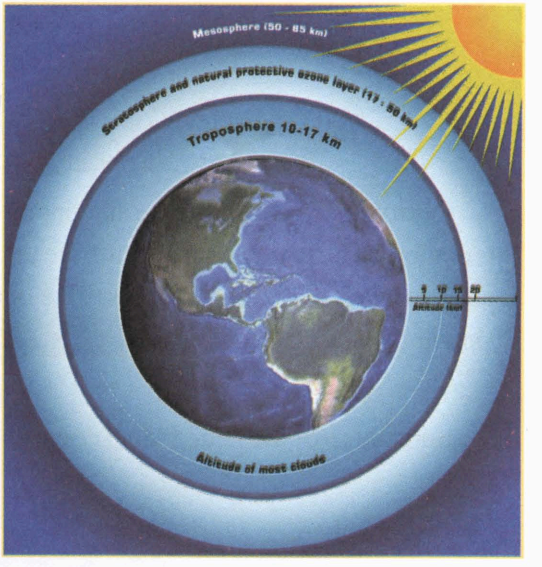
The distribution of temperature over the Earth's surface directly influences the pressure zones. Difference in the pressure patterns influences the wind patterns. When the temperature is high, the pressure is low and when the temperature is low, the perssure goes up. Genearally, wind blows from high pressure zones to low pressure zones.

The Troposphere influences the phenomena in the Biosphere and the Hydrosphere and in turn it affects human activities in a variety of ways.

Uses of the atmosphere

- It helps survival of life.
- Causes the process of photosynthesis
- Acts as a blanket over the earth's surface
- Stores water vapour
- Generates pressure and winds
- Affects rainfall phenomenon.

Fig1.5 : Location of the ozone layer



The ozone layer

The ozone layer which is a part of the stratosphere acts as a blanket to protect life on Earth's surface from the harmful ultra-violet rays.

The ozone layer absorbs the harmful ultra-violet rays.

The ozone layer is located in the stratosphere about 17-50 km. above the surface of the Earth and it acts as a protective blanket. 90% of the ozone gas is restricted to the stratosphere.

The gases that are destructive to the ozone layer are produced by

- Burning of fossil fuels
- The release of chlorofluorocarbons which are used in refrigerators (CFC).
- Release of gases like Methyl and Helium.

Destruction of the ozone layer has resulted in many harmful effects such as climatic changes, reduction of crop yields, destruction of sea ecologies, destruction of biodiversity, causing of skin diseases, eye diseases and respiratory problems.

The contribution of the world community towards protecting the ozone layer

Although many harmful results are caused by the rapid destruction of the ozone layer, individual countries alone cannot deal with this problem. Hence measures have been adopted by international organizations to prevent the destruction of the ozone layer.

Various agreements have been formulated on a global level for this purpose.

- 1985 Vienna agreement
- 1987 Montreal agreement
- 1997 Kyoto conference are some of them.

Activities

1. Mark the ozone layer in a diagram of the atmosphere indicating the different layers and give three reasons to indicate the importance of the ozone layer.
2. Discuss with the teacher three reasons that lead to the depletion of the ozone layer and the harmful effects caused thereby.
3. Write three factors leading to air pollution in your region and give three suggestions to minimize it.

4. I. Prepare a speech for the morning assembly giving information about the environmental hazards that would result from the rising of global temperature and the importance of protecting the Ozone layer.

II. With the assistance of your teacher, plan an awareness programme on this subject for the people of your neighbourhood.

Lithosphere

Various landscape features over the earth's surface are made up of different type of rocks. Mountain ranges, plateaus, plains and river valleys are some of these features. These landscape features are the result of diverse factors.

There is a close interrelationship between these landscape features and the human activities. Examples of such landscape features and their influence over human activities are discussed here.

Mountain Ranges

Himalayas , Hindu Kush , Arakanyoma, Andies, Rockies and Alps are some of the major mountain ranges of the world. Most of these mountain ranges found on the Earth's surface are the result of earth movements that originated due to internal forces within the interior of the Earth. On the surface they appear as mountain ranges. Over most of these mountain ranges there is a snow cover during the winter at higher elevations.

These regions are thinly populated as they are unsuitable for agriculture and industries due to unfavourable climate and rugged relief. Tourists are attracted to these regions for winter sports due to the snow cover. The hill slopes are important for rearing animals in summer and the melting snow during this season feeds the rivers that help agricultural activities in lower areas.

Hydro-electricity is produced in hilly areas where the rivers flow throughout the year.

Plateaus and waterfalls

Plateaus are an important landform found in mountainous regions. They are either flat or of an undulating nature and are separated from lower regions by steep slopes. Tibet is the highest plateau in the world. Deccan plateau in India and Horton

plains in Sri Lanka are other examples. Beautiful waterfalls are seen at the margin of the plateaus. They are significant for the production of hydro-electricity and to develop tourism. The plateaus with favourable climates are rich agricultural lands.

Plains

The lowlands are the result of past and present sedimentation . The lowlands with poor drainage have resulted in marshy lands. In such regions the rivers are characterized by meanders. When the water level rises floods occur during rainy periods. Indus plain and Northern China plain are some examples for plains. Southern Bangladesh provides a good example for a frequently flooded area. These are thickly populated regions of the world as they are rich agricultural lands and suitable to build transportation networks.

River valleys

River valleys form another important landscape feature in the world. Nile (Africa) Hwangho (China) Ganges, Brahmaputra (India) Mississippi (U.S.A.) and Mahaweli (Sri Lanka) are examples of river valleys. In most of these river valleys floods are frequent. Dams are constructed across most of these rivers for irrigation purposes as well as for flood control. These projects are mainly for agricultural development. River valleys are thickly populated and predominantly agricultural regions. As a result of the transport networks these areas are important for human activities like industries and trade.

Shields

Canadian shield, Russian – Baltic shield, Brazilian plateau, West Australian plateau and plateau regions of Africa are also important landscape features consisting of ancient rock strata. They are stable land masses 600- 3500 million years old. Due to the presence of mineral resources in these areas mining is important as a human activity.

Activities

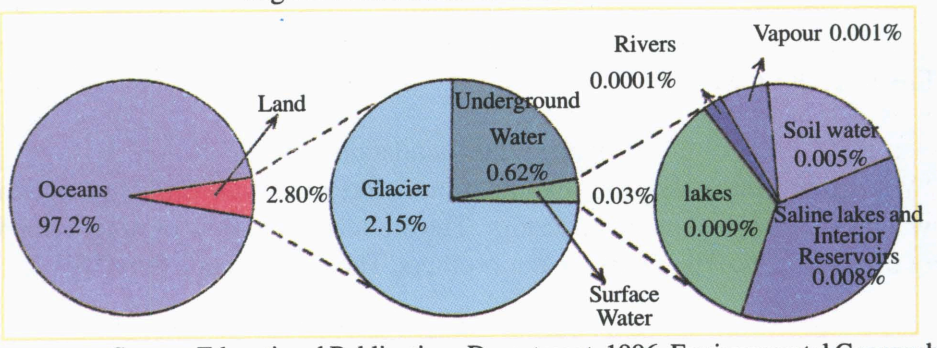
1. Prepare a table including examples of relief features which are strongly related to human activities.
2. Mark and name these relief features on a map of the Asian Region.
3. Give two examples for each landscape feature to illustrate how they are utilized for human activities.

Map1.1 : Major landforms of the world

Hydrosphere

The aggregate of areas over the surface of the Earth covered by water can be termed the Hydrosphere. The water over the earth's surface changes into solid, liquid or gas forms alternatively. The distribution of water over the surface of the Earth is shown in Fig.1.6.

Fig 1.6 : Global distribution of water

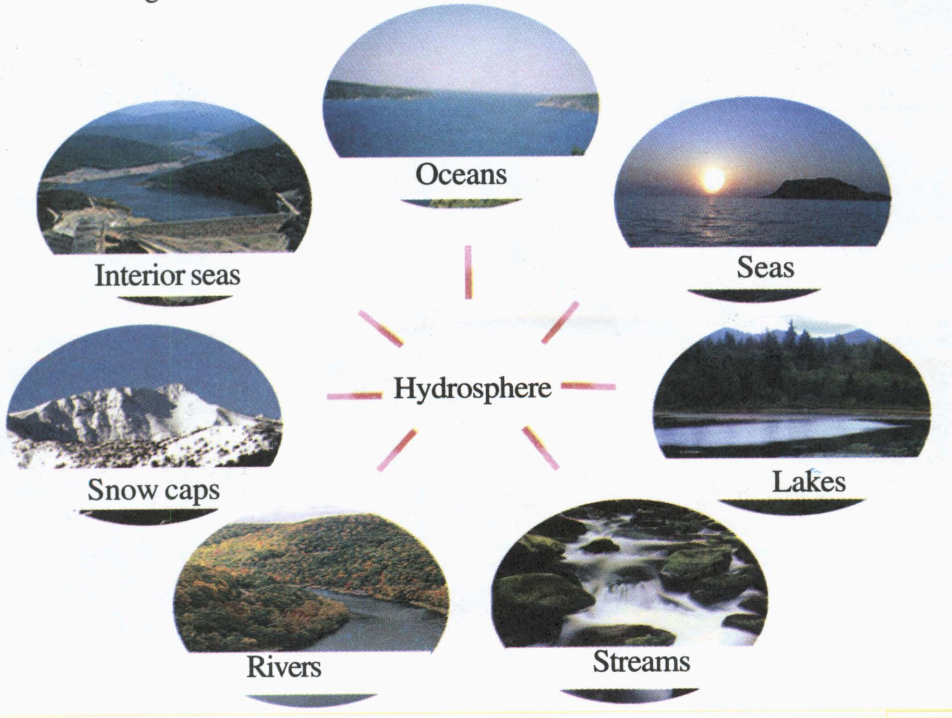


Source: Educational Publications Department, 1996, Environmental Geography

Global water

Another noteworthy feature is that more than 97% of Global water is trapped in the oceans. Major portion of what is left is in the frozen state and not available for human use. When you examine the following Fig. you will realize that only a very small proportion of water on the surface of the Earth can be used by man.

Fig. 1.7 : The distribution of water over the earth's surface



As shown in Fig 1.7 the most important features are the ocean surfaces with saline water, seas, interior water bodies like lakes and rivers. In addition, there is some amount of water in solid state in high latitudes and trapped on mountain tops in the form of ice.

The interrelationship between water and human activities

Among the natural resources of the world water is of foremost importance as life depends on water resources.

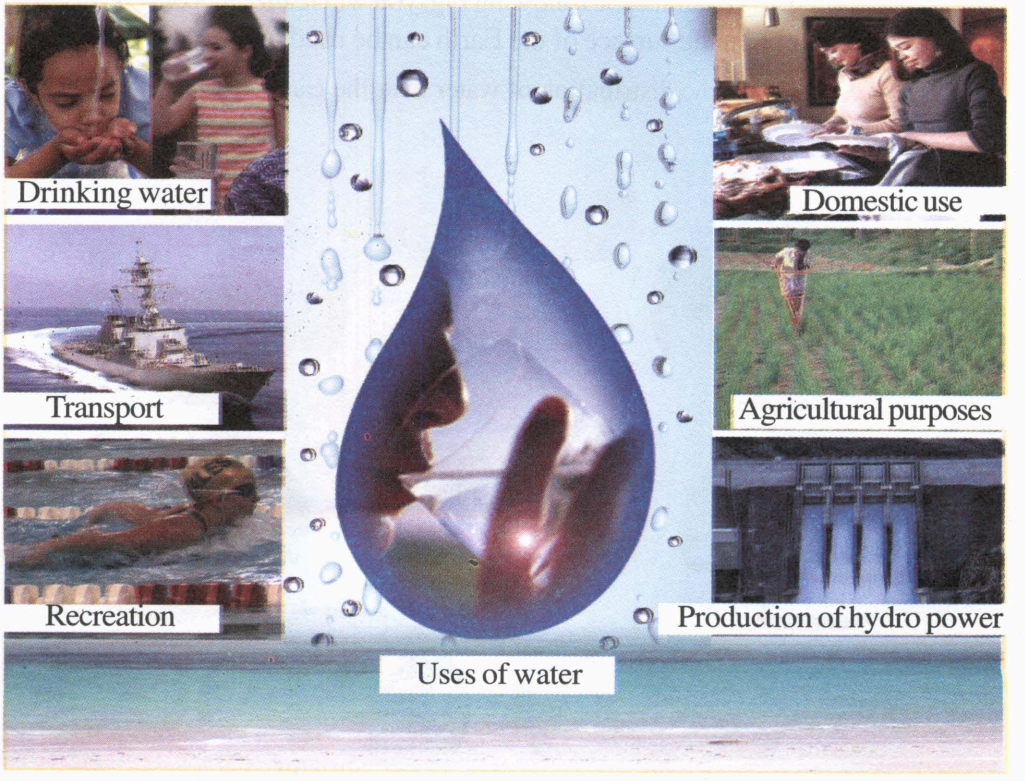
"Water is the foundation of life"

"Water that flows along the streams shining like diamonds is not just a stream of water. It is the blood of our ancestors . The thunder of the flow of water is the voice of my ancestors. The rivers are our brothers. They quench our thirst".

Seattle-The Red Indian Chief

This statement shows us the bond that has existed between water and man over a long period.

Fig.1.8 : The utilization of water by man



The Earth has abundant water supplies yet only 0.03% of this resource can be utilized for human activities.

According to the information in Fig. 1.8 man uses surface water for many purposes such as drinking and domestic purposes, industries, production of hydro electricity, transport and recreation.

Shortage of water

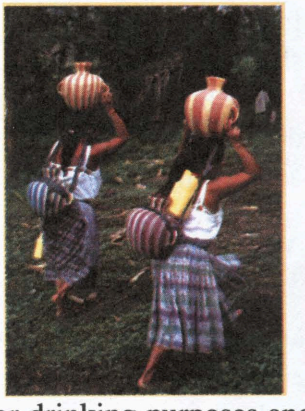


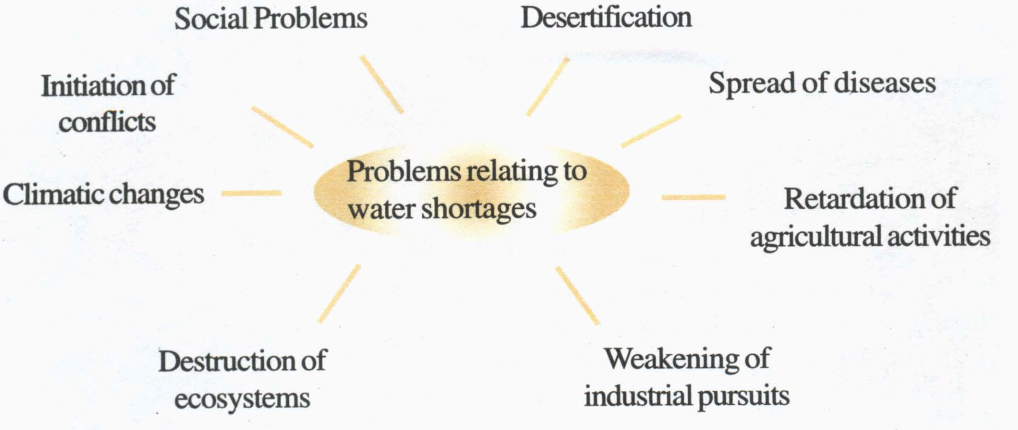
Fig 1.9 : A journey in search of drinking water

The daily consumption of water has increased immensely due to the increase in population.

Shortage of water has a direct effect not only on the diurnal water requirements of man but also on many other activities as agriculture, industries, development of hydro-electricity and tourism.

According to the estimates of the United Nations an acute water shortage is predicted for about 66 countries by year 2050. So many problems would arise due to this factor. When there is a shortage of water for drinking purposes and domestic use people will be compelled to consume polluted water leading to health problems. Shortage of water can also lead to conflicts and social tension. The other problems related to shortage of water are indicated in the Fig 1.10

Fig. 1.10 : Problems arising due to water shortages



Excess water resources too create problems. Bangladesh in the South Asian region is a country where frequent floods cause extensive damage to human life and property. Pakistan in the same region is a nation that faces difficulties due to shortage of water.

Problems are created due to water shortage as well as due to polluted water.

Fig. 1.11 : A region affected by floods

Water pollution

Water is polluted due to a variety of reasons. The chemicals used for agricultural purposes as well as for industrial purposes drain into water ways.

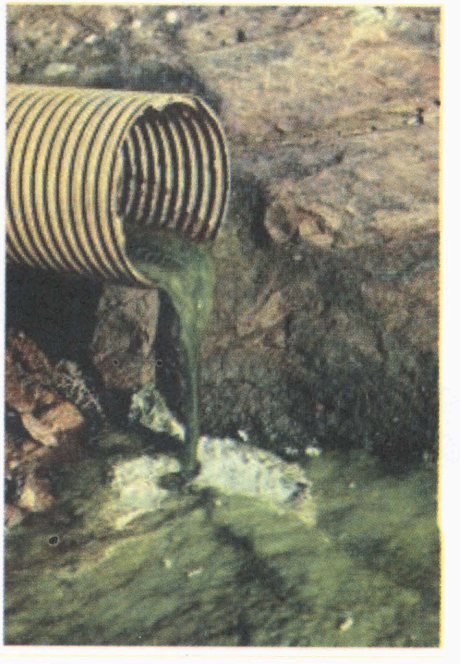
Other major causes of water pollution are the release of water polluted with garbage from houses and hotels and burnt oil from industrial and other activities into water bodies.

According to information provided by the World Health Organization a major factor which would hinder development projects by year 2020 would relate to diseases due to polluted water.

Fig 1.12 : Pollution of water

Accordingly, a reduction of driking water resources could be the most acute problem that the people have to face in the future. Hence the foremost duty of the world community shoul be to consistantly protect and conserve the water resource.

Fig 1.13 : Release of waste matter into water



Water could be the most precious natural resource in the future

Activities

1. Name three occasions where shortage of water directly influences the human activities.
2. Copy this activity into your exercise book and match column 'A' with column 'B'.

'A'		'B'
Bangladesh	-	Lack of sufficient water
Pakistan	-	Drinking impure water
Health problems	-	A country faced with shortage of water
Diseases	-	Shortage of water for agricultural purposes.
Damage to crops	-	subject to frequent flooding
Desertification	-	caused by shortage of water.

3. Complete the following table indicating the reasons for water pollution in your area and the steps that could be taken to prevent the same.

Reasons for water pollution	Steps that can be adopted to prevent water pollution

4. Compile an atlas with maps to cover the following themes.
   - Major mountain ranges
   - Major rivers
   - Major seas
   - Major plateaus
   - Major plains
   - Major lakes
5. Group students in the class to prepare a plan to minimize the wasteful use of water in school.

The Biosphere

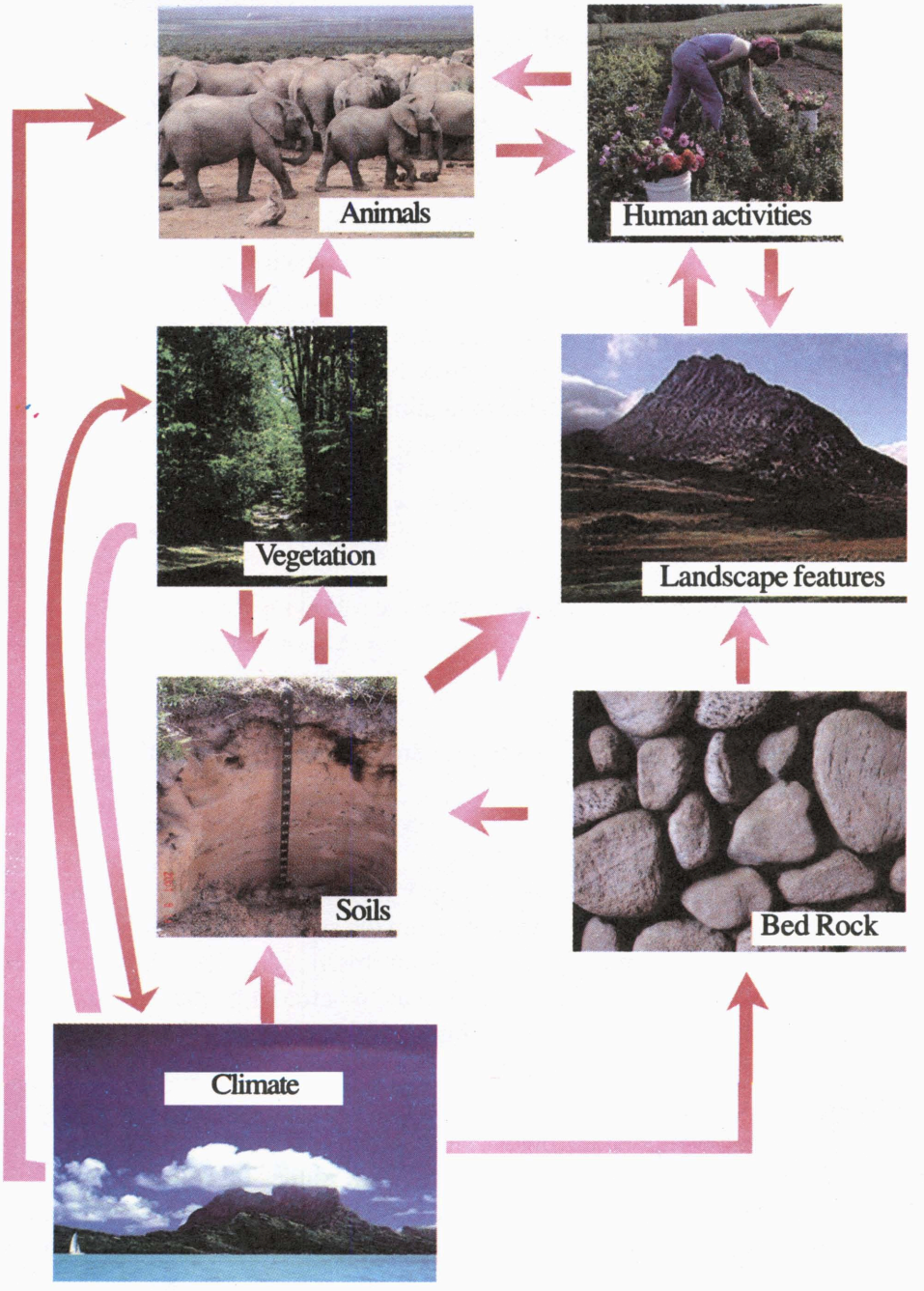
Living elements of the Blue Planet with unceasingly active processes is called the Biosphere. Atmosphere extending from the surface of the earth up to the limit of the availability of air used by the living organisms, region of the lithosphere used by the root systems of plants and trees as well as the area of bacteria formation and the portion of the hydrosphere receiving sunlight necessary for the photosynthesis process set the limits of the biosphere.

There are two factors that influence processes in the Biosphere.

1. Living components (plants, animals and decomposers)
2. Non - living components (solar energy, water, soil and air)

The existence of the Biosphere depends on the interaction of all these factors. The Biosphere consists of many eco-systems and the constant interaction between plant and animal components is an important process. Sometimes the processes related to one organism would be favourable or unfavourable to another organism.

Fig. 1.14 : The interactive processes of the Biosphere



The relationship between animals and man is one example. The elephant habitats are destroyed due to human activities leading to conflicts between man and animals. On the other hand animals domesticated by man provide milk, meat, wool and hides.

As shown in Fig 1.14 climatic factors result in the decomposing of the bed rock which creates the soil layer on which plants grow, while decomposition of plant matter adds organic material making the soil rich in humus.

Activity

Study these interrelationships in the Biosphere further by looking at Fig..1.14 and prepare a note.

Now let us examine how climatic factors influence the existence of the Biosphere.

Temperature is the most important element of climate. It is the result of the solar energy. Temperature affects all other climatic phenomena like humidity, pressure and precipitation . A favourable climate is of much use to determine plant and animal life. Distribution of population, agricultural activities and human settlements are shaped by the climatic factors.

There is a close relationship between rainfall and the Biosphere. The transference of water between the Atmosphere, Hydrosphere and the Biosphere is referred to as the water cycle (Fig 1.15).

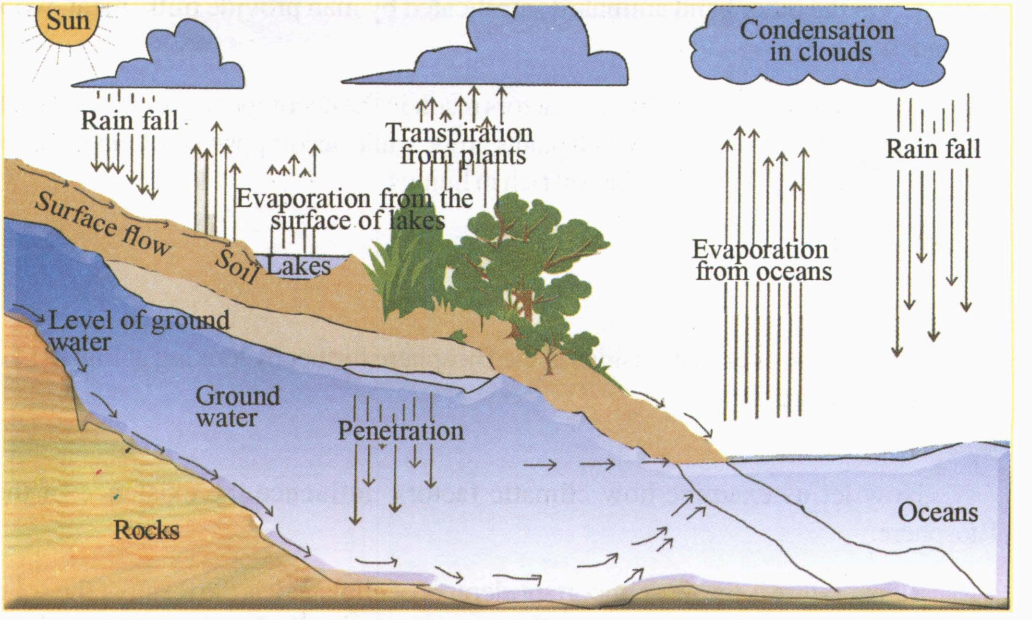
Hydrological cycle is a marvel of nature

Seasonal variations and the diversity in human activities

In grade 8 you studied about the occurrence of day and night and difference in time over the globe, and the occurrence of seasons due to the rotation and revolution of the Earth respectively.

Seasonal variation which is a result of the revolution of the earth has its influence on living beings as well as on the diverse human activities. This influence is specially felt in the economic, social and cultural spheres.

Fig 1.15 : The hydrological cycle



Over mid latitudinal and higher latitudinal regions the seasonal variations are clearly seen, but such variations are not evident in lower latitudes and equatorial regions. As a result of the changes in the environment during different seasons there are variations in human activities.

The construction of houses adapted to seasonal variations (Igloos of Eskimos which are constructed to resist very low temperatures), winter sports, agricultural activities depending on seasons, changing of grazing lands with seasons, (transhumance) wearing different garments to suit the seasons , celebrating the arrival of seasons, (e.g. in Japan-period in which the sakura flowers bloom is a festive season) are some of these activities.

Tourists are attracted to different regions depending on the seasons. Get an idea of this by looking at Fig.1.16.

Vegetation as well as the behaviour patterns of animals change according to seasons. During winter the trees show adaptation to lower temperatures by shedding their leaves. In winter the birds migrate to tropical areas for breeding and return to the original habitats during summer. This could be observed with reference to migratory birds in the Bundala and Kumana sanctuaries in Sri Lanka.

Activities

1. Name the four seasons with the knowledge gathered in Grade 8.
2. Compile a Table to show the major characteristics of the four seasons.
3. Identify the ways in which man, plants and animals adapt to seasonal variations and give two examples for each.
4. Name four human activities which are harmful to the Hydrosphere.
5. Compile a paper containing creative information regarding the inter- relationships that occur within the Biosphere.

Fig 1.16 : Different activities during seasons

You have studied in this lesson about the Atmosphere, Hydrosphere, Lithosphere and their interrelationships that have created the Biosphere.

This clearly shows that the earth known as the Blue Planet is unique in the solar system.

There is a close interrelationship between the physical environment and the human environment of the Blue Planet. Disruption of this relationship leads to environmental crises.

As the Blue Planet is the home of all living beings, it is our duty and responsibility to maintain its environmental equilibrium.

Activity

"Our home is the Blue Planet with unique characteristics"

Based on this theme

- Prepare one of the following creations.
  A painting, poem, song or speech.

Sources

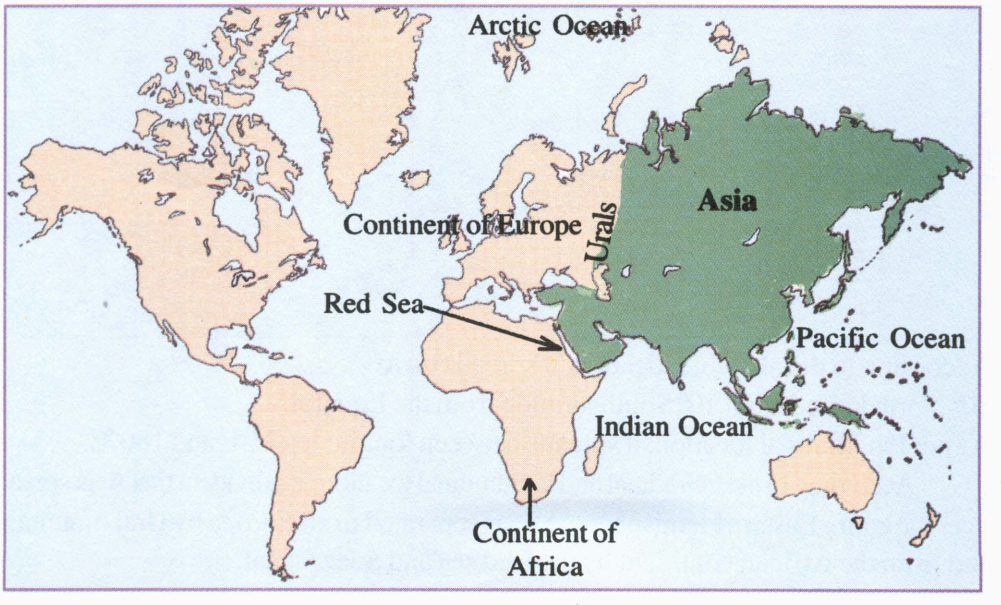
- Educational Publications Department, 1996, Environmental Geography
- Educational Publications Department, 1990, Physical Geography
- Educational Publications Department, 1981, Landscape
- Ministry of Environment and Natural Resources, 2003, 'Pasa-Diya' Magazine, Vol.1, No. -3
- Kotalawala A.B., 1994, Environmental Science, Lake House Investments Ltd,
  (All of the above publications are in Sinhala)
- www. national geographic.com
- www. nou sri lanka .org
- encarta –encyclopedia – 2009, Google Earth

2 The Physical and Human Landscape of the Asian Region

Regional identity

The Asian Region which occupies about 1/3 of the total land area of the world covers 43.6 million km^2. This vast region contains a multitude of topographic features, climates, vegetations and a variety of human activities that are a response to these physical characteristics. The objective of this lesson is to explore in detail the nature of the physical and human environment in this region together with its components, characteristics and processes. Now let us see the location of the vast area covered by the Asian region in a world map.

Map 2.1 : Location of the Asian Region



The Asian Region is bordered by,

Arctic Ocean	-	on the North
Indian Ocean	-	on the South
Pacific Ocean	-	on the East and
The European Continent and Red Sea	-	on the West

Study the map 2.1 and identify this region.

Map 2.2 : The Absolute Location and Topography of Asia

According to the absolute location, it spreads up to
80° North latitude and 10° South latitude from the Equator.
As per longitudinal location, it spreads between longitudes 25°E and 180°E.

According to the latitudinal and longitudinal locations it is evident that Asia spreads over the entire Eastern Hemisphere. Asia is separated from Europe by Ural mountains and from the African continent by the Red sea and Suez Canal.

Activities

1. With the help of an atlas, mark and name the boundaries of the Asian Region and its latitudinal and longitudinal extents, on an outline map of the world.
2. Compare the extent of the Asian continent with other continents and make three sentences.

The Asian Region which constitutes one of the oldest landmasses of the world, is also the largest continent. It has well marked physical and human characteristics distinguishing it from the other continents. Asia is the home to the world's most ancient civilizations such as Euphrates, Tigris, Indus Valley and Hwang Ho. Similarly religions such as Buddhism, Hinduism, Islam, Christianity and other faiths such as Confucism and Shintoism arose here. Asia also includes within it countries like Sri Lanka and India where excellent irrigation technologies of the ancient hydrological civilizations evolved.

Map 2:3 : River valleys, Civilisations and Cities in Asia

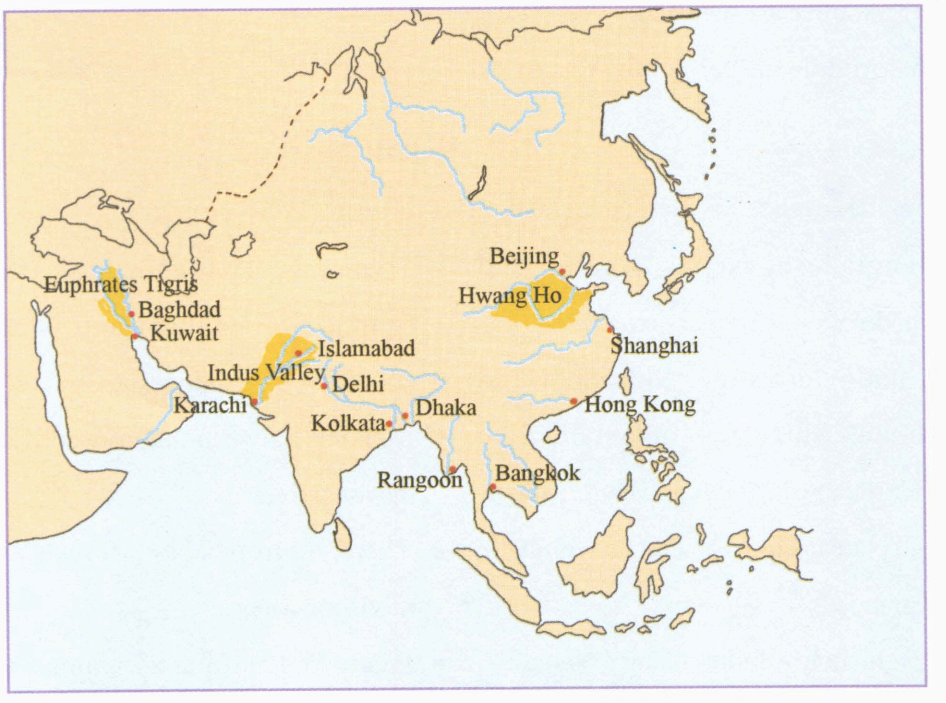
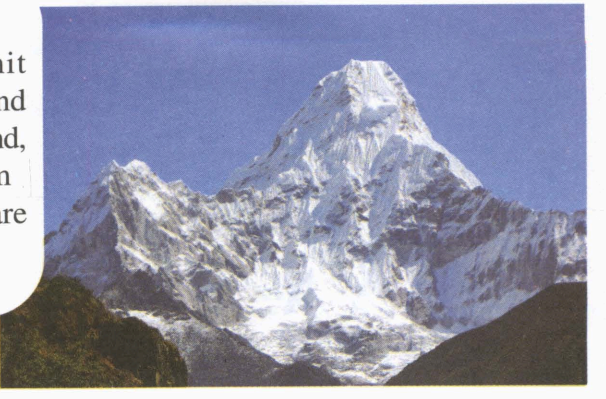


Fig 2.1: Mount Everest



The highest summit Everest (8 848 m) and the deepest point on land, the Dead Sea (403 m below sea level) too are located in this region.

Asian Region is the eastern part of the large land mass called Eurasia to which Europe and Asia belong. Six zones can be identified within the region according to the terrain, climate and cultural features (Map 2.4). These zones are,

1. North Asia
2. South Asia
3. East Asia
4. Central Asia
5. South East Asia and
6. Middle East or South West Asia.

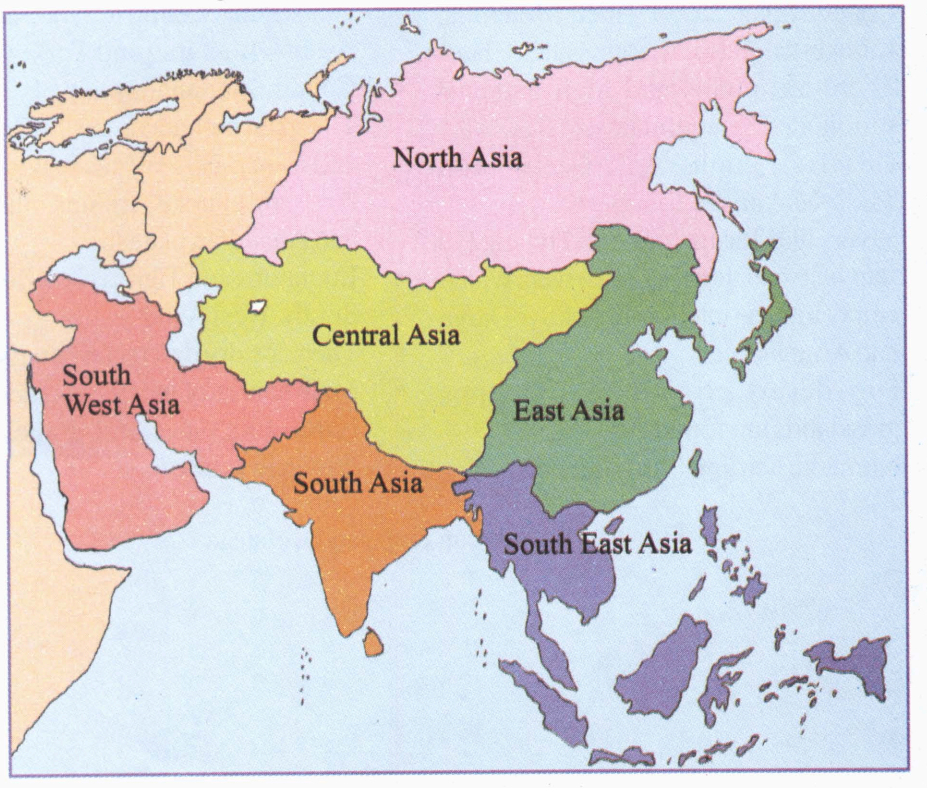
South Asia

- Includes India, Sri Lanka, Pakistan, Bangladesh, Nepal, Bhutan and Maldives.
- Himalayan range, Sulaiman and Hindukush ridges, mountains like Pidurutalagala, Indus and Horton plains and plateaus like Deccan lie within the region.
- Rivers such as Indus, Ganga, Narmada, Tapti, Brahmaputra, Mahaweli and Nilwala drain the region.
- There are tropical forests.
- Crops such as paddy, cotton, maize and tea as well as different types of industries are found here.
- It is a densely populated zone.

South East Asia

- Consists of countries such as Myanmar, Thailand, Malaysia, Cambodia, Vietnam and island countries, e.g., Indonesia.
- Mekong, Salween and Irrawaddy are the main rivers.
- There are tropical rain forests and monsoon forests.
- Paddy and shifting agriculture are major cultivations.
- Assembling industries and electronics predominate.
- A densely populated zone.

Fig. 2.4 : Various Zones in the Asian Region



North Asia

- A vast plain.
- Contains Siberia and Tundra regions.
- Main rivers are Ob, Yenisey, Lena and Amur.
- There are Taiga or Coniferous forests.
- Timber industry and nomadic herding are found.
- A sparsely populated zone.

East Asia

- Main countries are Japan, Taiwan, South Korea and China.
- Contains high plateaus and plains.
- Yangtze, Si kiang and Hwang Ho are the main rivers.
- Constitutes leading industrial countries where motor vehicles, ships, electronic equipment etc. are produced.
- Paddy and maize cultivation are important agricultural activities
- A densely populated zone.

Central Asia

- Contains plateaus of Tibet, Mongolia, Kazakhstan and the western part of China.
- There are plains and high plateaus surrounded by mountains.
- Deserts such as Gobi and Takla-Makan are found.
- Rivers like Tarim, Yangtze, Hwang Ho start here and there are also rivers which empty into the interior seas of Syr Darya and Amu Darya.
- Dry desert climate and steppes grasslands are found.
- Nomadic herding is in evidence.

South West Asia

- Constitutes countries like Saudi Arabia, Iran, Iraq and Turkey.
- Contains mountains and plateaus. The main mountains are the Zagros and Caucasus. Plateaus include the Arabian plateau, Iranian plateau and Anatolian plateau.
- Euphrates and Tigris rivers flow in South, West Asia.
- There are dry desert characteristics.
- Main source of income is crude oil. Fruits like dates and grapes are grown in oases.

Fig. 2.2 : A mountain range and a plateau

Activities

1. Complete the following table.

Zone	Areas belonging to	Rivers	Topographic features	Economic activities
South Asia South East Asia South West Asia Central Asia North Asia East Asia				

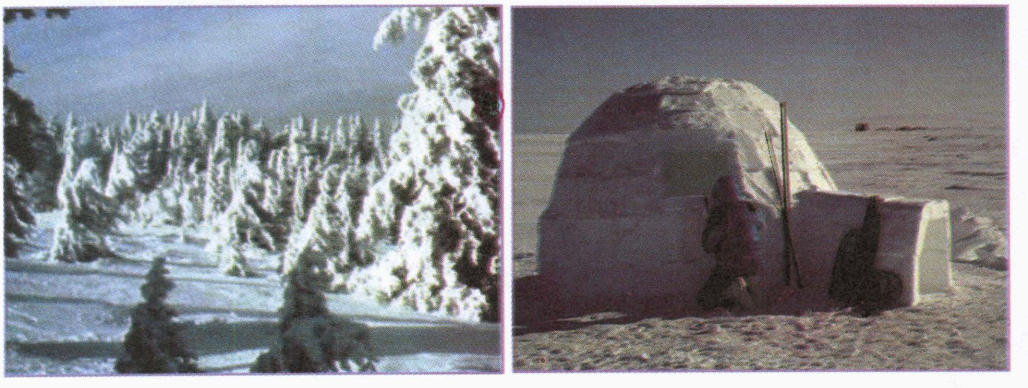
2. Divide students into six groups and prepare a folder containing information about these zones.

The Physical Landscape of the Asian Region

The Asian Region displays a diversity of physical features that cannot be found in other regions. Let us find out about the physical landscape of this diverse region (see Map 2.2).

The Northern plain of the Asian Region is a well-marked topographic feature. As this area is snow-clad during most parts of the year the flow of north flowing rivers is impeded resulting in marshy lands in some areas. This retards agricultural activities.

Fig. 2.3 : Cold Climate and Igloos of Eskimos



Because of the construction of the Great Siberian Railway, the surrounding areas show some signs of development. On the whole, the region is very sparsely populated. The climate is harsh and Eskimos living in the region show adaptations to the harsh climate (Fig. 2.3).

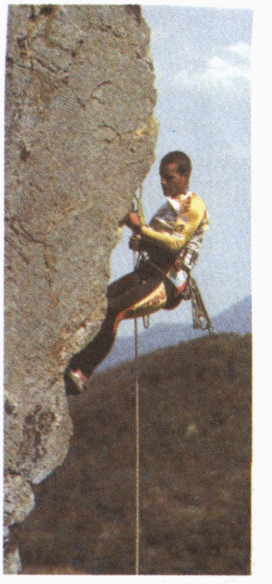
Another specific topographic feature in the Asian region is the ancient mountain ranges and plateaus. The mountain ranges which run to the east and west of the Pamir knot are known as the back bone of Asia. These mountains spread up to the Anatolian plateau in the West and to China and Indonesia in the East.

For your knowledge

The Himalayan ridge is the geological paradise of the World.

Identify the mountain ranges of Himalayas, Karakoram and Hindukush from Map 2.2 showing the topography of Asia.

Fig 2.4: Climber



Overall, the mountain areas in Asia are;

- Not suitable for human habitation due to the rough and rugged relief.
- Provide many river catchments.
- Possess Alpine grasslands.
- Not important for agricultural activities.
- Provide homes for tribal people.
- Important for recreational activities like skiing and mountain climbing.

There are many plateaus and deserts surrounded by these mountains. The deserts that consist of infertile grasslands and sand plains are unpopulated. But Iranian and Deccan plateaus which enable dry grains to grow have moderate populations.

Activities

1. i. Draw a map of Asia and shade the highest area with the help of an atlas.
   ii. Mark and name a few rivers starting from the Himalayas.
2. Identify the mountains and plateaus located in the Asian Region and tabulate them.

This region has been home to a number of historic civilizations of the world such as Indus, Hwang Ho, Euphrates and Tigris.

There are many river valleys with an economic importance located in the Asian Region and they are given below. Find the location of these river valleys, with the help of Maps 2.2 and 2.4.

River Ganges	Sikiyang	River Indus	Yangtze	Irrawaddy
Hwang Ho	Menam	Euphrates	Mekong	Tigris
Ob	Lena	Yenisey	Amur	

Most of these rivers are often subject to floods. Therefore, valleys with fertile soils have been created. Agricultural lands and human lives are often destroyed due to floods. Presently, huge dams are built to control floods making these areas densely populated.

- Paddy cultivation is spread in river valleys like Menam, Meekong, Salvin, Irrawaddy etc.
- In addition to paddy, crops such as sugar cane, maize and barley are grown.
- This is a densely populated region.
- Therefore, cultivable land gets fragmented.

For your information

River Hwang Ho is called the sorrow of China.

Many cities are located in river valleys in the Asian region. eg: Beijing, HongKong city, Yangon (Rangoon), Dhaka.

Table 2.1 : Lakes and Seas in the Asian Region

Lakes	Seas
Bikal lake	Japanese sea
Balkhash lake	Arabian sea
	Chinese sea
	Andaman sea
	Black sea

For your information

The longest river in Asia is Yangtze kiang

These lakes and seas are useful to man in various ways.

Seas

- Important for fisheries. There is a main fishing ground close to the Japanese sea.
- Important for water transport. Main sea routes are located.
- Corals and pearls are obtained.
- There are oil deposits near the Bay of Bengal and the Arabian Sea.
- There is competition in utilizing marine resources which sometimes has led to conflicts.

Activity

H	I	N	D	U	K	U	S	H	P
D	R	O	H	P	U	R	A	L	S
G	R	A	M	T	H	A	R	K	U
C	A	L	T	A	I	L	T	P	L
H	W	A	N	G	H	O	M	U	A
T	A	M	U	R	T	I	G	R	I
U	D	M	E	K	O	N	G	S	M
Z	D	R	M	L	B	D	A	R	A
X	Y	G	I	N	D	U	S	P	N
G	A	N	G	E	S	S	V	T	L

1. Copy the above chart into your exercise book and find out the names of mountain ranges, rivers and lakes hidden among the letters and shade them.

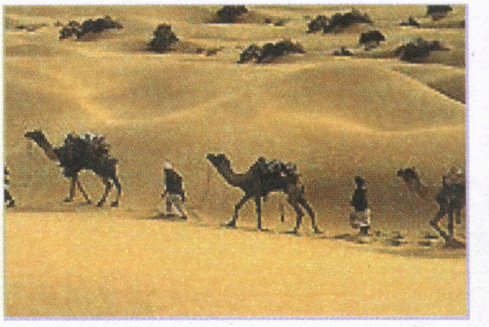
Climate of the Asian Region

Following is an article on the 'Climate of the Asian Region' prepared by Situmini for the school magazine.

Most features of the world climate are found spread over the Asian Region. The reason for this is the latitudinal extension of this region from the Equator to the Polar Regions. At one end people travel in sledges while at the other end they ride on camel back across deserts. However, climatic extremes do not prevail among the islands and the coastal areas.

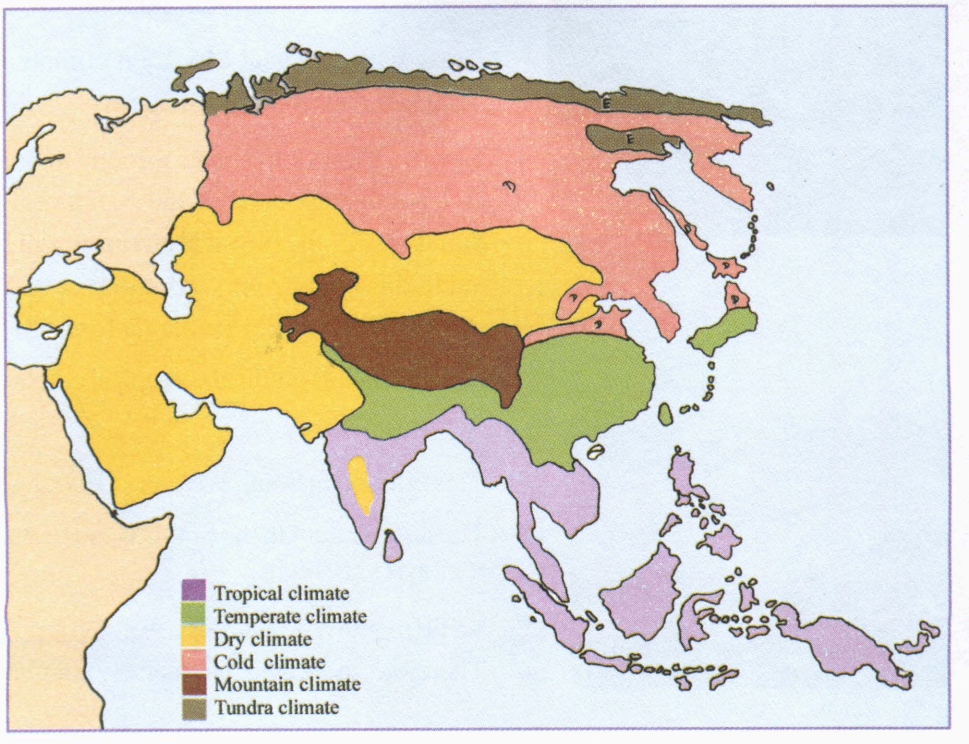
Fig. 2.5 : A snow desert

Fig. 2.6 : A dry desert



Simplified climatic conditions in the Asian region are shown on Map 2.5. As the Map shows Monsoon Climate is specific to Southern and South-East Asian regions.

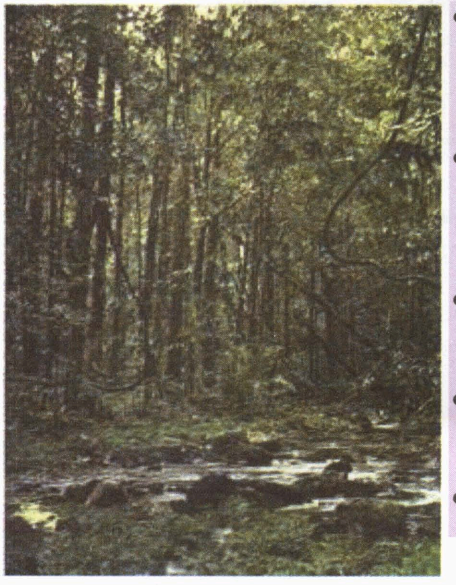
Map 2.5 : Climates of the Asian region



According to the map, following main climatic types are found in the Asian Region.

1. Tropical climate
2. Dry climate
3. Temperate climate
4. Cold climate
5. Tundra and mountain climate

Fig. 2.7 : Tropical Monsoon Forests



Tropical Climate

- There are a few variations of this type (Hot wet climate, Monsoon climate, Tropical Desert climate etc.).
- In the first two types of climate, high temperature and heavy rains persist throughout the year.
- According to these variations, there are changes in temperature and rainfall.
- Areas with Tropical Monsoon climate are suitable for agricultural activities.
- Tropical Monsoon climate is found in South and South East parts of the Asian region. Suitability of the physical environment has made these areas very populous. Fig. 2.7 shows a view of the Sinharaja forest in Sri Lanka that falls within the Tropical climate.

Fig 2.8 : Nomadic Herding

Dry Climate

- This is found in South West and Central Asia.
- The temperature in the South Western Asian region is very high.
- Central Asian regions, are very cold. Therefore, these areas are sparsely populated.

Fig 2.9 : Fruit Plantations

- Nomadic herding predominates among human activities. Fig. 2.8 shows a herd of animals reared by herdsmen in Central Asia. Dry grains such as maize and barley and fruits are grown in areas where there is a fair amount of rain.

Temperate Climate

- There are many varieties. The main among these are the Mediterranean climate and the Temperate desert climate.
- The main characteristic of the Mediterranean climate is wet winters and dry summers.
- This climate is favourable for human habitation. In Asia, the region close to the Mediterranean Sea belongs to this climate.
- These areas are noted for production and export of fruits such as grapes and apples (Fig. 2.9).
- Areas with temperate desert climate are sparsely populated. People live in places where mineral resources such as iron ore, copper, silver etc. are mined.

Fig 2.10 : A Cold Region

Cold Climate

- Found in North Asia, Siberia and North Japan.
- Excessive cold makes these areas unsuitable for human habitation.
- Timber industry is carried out in coniferous forests. See Fig. 2.10.

Fig 2.11: Tundra Region

Tundra and Mountain Climate

- Area is covered with snow during most parts of the year.
- There is no other vegetation cover except moss (Fig 2.11)
- Not suitable for human habitation.

Activities

1. Name 3 types of climate found in the Asian Region.
2. Give two characteristics of each of these climatic types.
3. To which climatic type does the area you live in belong? Mention 3 of its characteristics.

Natural Resources

Natural resources are those which are naturally formed in the crust of the earth without the intervention of man. The Asian Region is rich in these resources. Most important among these resources are forests, mineral oil, natural gas and the oceans.

Forest Resources

The forest resource consists of three main components.

Table 2.2 : Forests in the Asian region and their uses

Forests	Areas of location	Types of plant
Coniferous	North Asia	Yellow pinus Red pinus
Deciduous	Siberia	White pinus Douglas fur
Tropical	India Malaysia Indonesia The Philippines Sri Lanka	Mahogany Teak Sandalwood Boxwood

All these forest types provide multiple uses such as fuel and timber. They also contribute to conserve soil, beautify the environment, protect natural balance and ground water.

Fig. 2.12 : Collection of firewood for domestic uses

In Russia, most of the timber is used for the construction of houses and for domestic consumption. Only 20% is used for export. Fig. 2.12 shows some people carrying firewood for domestic use.

Petroleum

Mineral Oil

- The Middle East (belonging to the Asian Region) has experienced a revolutionary change in development owing to the presence of mineral oil.
- There has been an unprecedented development in the Middle East because of the income received from petroleum.
- OPEC in which there is strong Middle East representation had been established to control prices of petroleum. It influences the entire world economy.
- Oil fields are located in countries like Indonesia and India as well. Natural gas is also found in the vicinity of oil fields.
- A main feature of these regions is that the production of oil is in the hands of the multi - national companies.

  Eventhough foreign exchange flows into the country through the sale of oil, there are vast discrepancies in the distribution of income. This has resulted in a low level of human development.

Activity

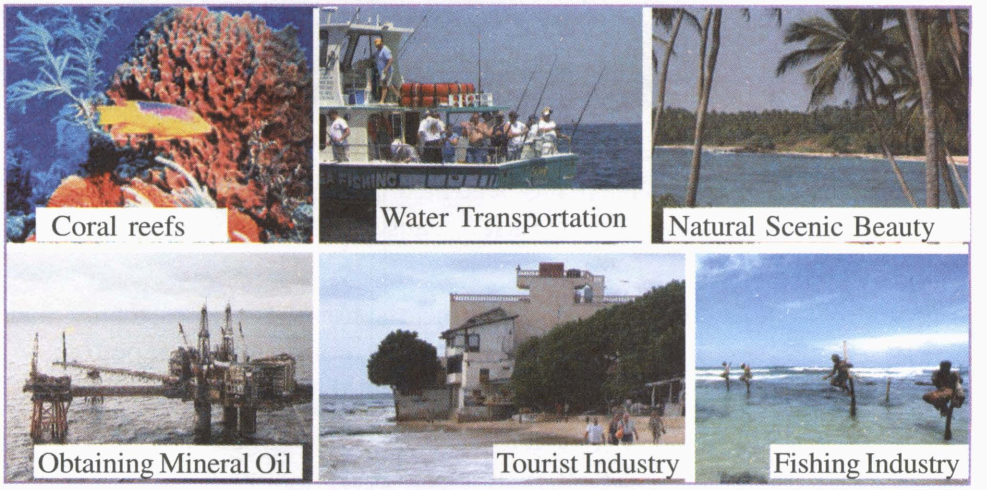
With the help of the teacher and using an atlas, mark and name the places where the main oil fields and natural gas fields in the Asian Region are located.

The Marine Resource

The coast line of the Asian Region is about 32,000 km. You have learnt in grade 7 the names of oceans and seas belonging to this region. The marine resources of the Asian Region are utilized for various purposes. Transport, fishing, tourism and under sea exploration are outstanding among them.

Important fishing ground close to Japan in the Northern Pacific is also located in the Asian Region. The largest fish breeding centre of the world too is located in Japan. At present, there is keen competition among countries to acquire ocean resources.

Fig. 2.13 : Uses of the ocean



Activity

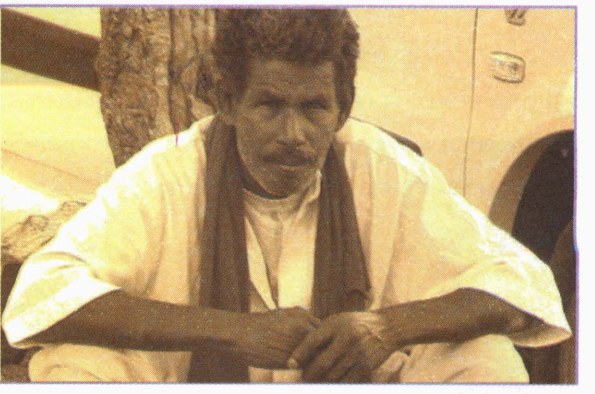
Prepare a list of uses from marine resources.

Human Landscape

As shown earlier, the physical diversity of the Asian Region which is the largest landmass in the world has been instrumental in bringing about striking changes in its human landscape. This diversity is clearly shown by different human races, multiple cultures as well as the variations in major human activities such as agriculture and industries. Fig. 2.14 and Fig. 2.15 show the two types of human race living in the Asian Region. Their inherent characteristics are shown in the following chart.

Fig. 2.14 : Mongoloid

Fig. 2.15 : Caucasoid



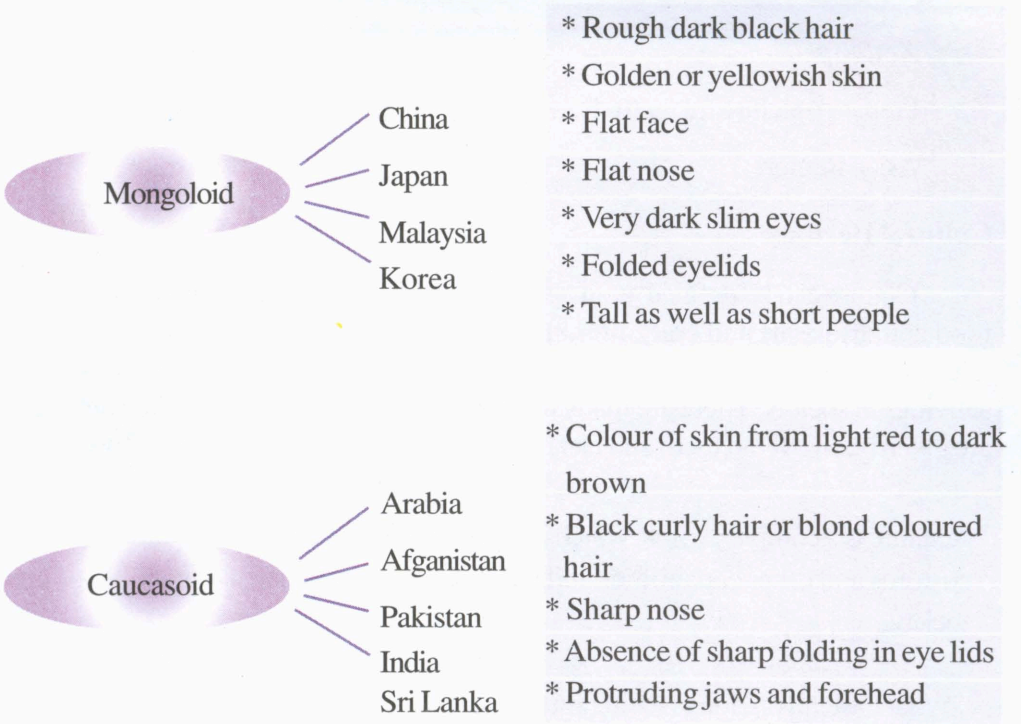


Fig. 2. 16 : Different Nationals in the Asian Region

Sri Lankan Arab Indian Chinese

By looking at Fig. 2.16, you can understand that even the same human type differs in different zones in Asia. The plausible reason for this is the differences in the physical characteristics of human races according to climatic and environmental factors. Mixed races are found in the region owing to interbreeding of the different races mentioned above.

Activity

Prepare a picture folder to show various ethnic groups living in countries of the Asian Region.

Cultural Heritage

Culture can be defined as an aggregate of elements such as language, clothing, food and drink, art and craft, literature, education, laws, norms and customs, and faiths of people living in a society. Culture is the force which provides the basis for all activities in society. There are many definitions of culture. A few selected definitions are given below. Read them and clearly understand what is really meant by culture.

"Culture is a complex whole which induces knowledge, beliefs, art, morals, laws, customs and other capabilities and habits acquired by man as a member of the society"

E.B. Tylor

"What basically belongs to literature, history and art is culture"

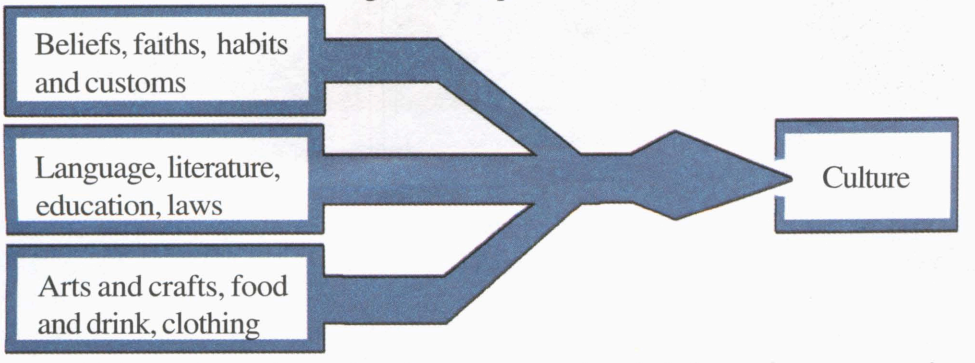
Lord Bertrand Russel

"The collective name which can be given to all the behavioural patterns which are symbolically owned by the society and acquired from generation to generation is culture"

Charles .A. Elwood

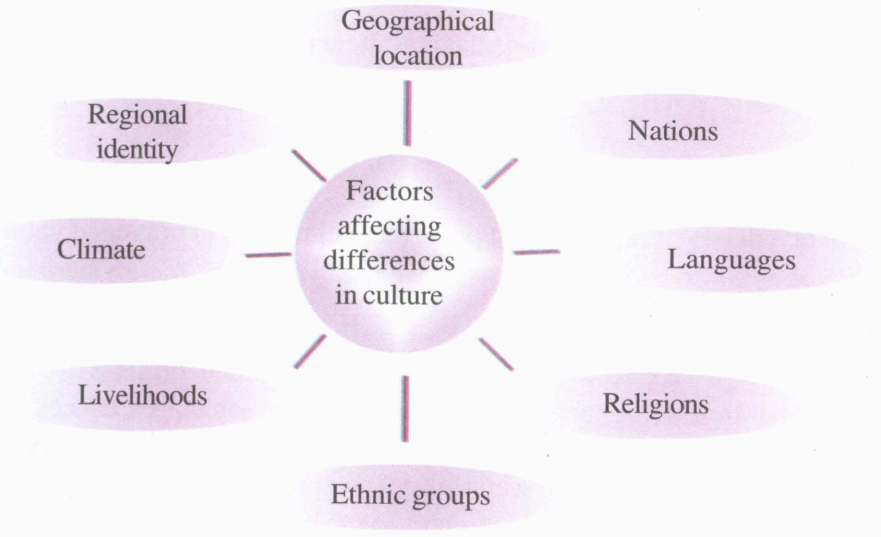
The following chart shows the relationship of various aspects relevant to culture.

Fig. 2.17 : Aspects of Culture



Culture depends on the above aspects handed down from generation to generation. The nature of culture differs because of the influence of different factors. Study Fig. 2.18 and identify these factors.

Fig. 2.18 : Factors affecting differences in culture



Aspects common to all cultures

Language, clothing, worship, religion, methods of greeting, marriage, employment, arts and crafts, industries, habits and customs, traditions etc.

According to the cultures of various ethnic groups such as Tamils, Muslims, Sinhalese, Malays, etc. there are differences in clothing, food and religious practices. A country has different cultures, owing to the presence of people belonging to diverse ethnic groups and religions. A person living in a society has to maintain interrelationships with cultures that differ from his own. Fig. 2.19 shows places of worship of some religions.

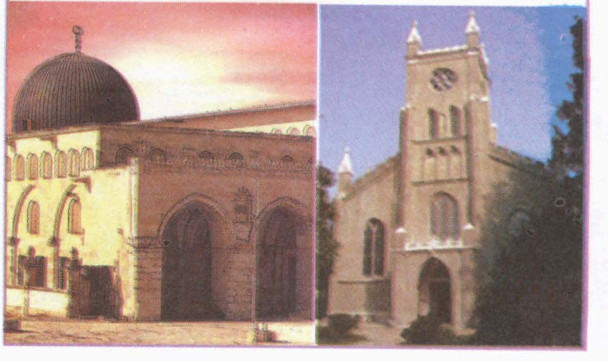
Fig 2.19:

Temple

Hindu Kovil

Mosque

Church



Activity

Construct a conceptual map containing all elements necessary for the sustenance of a culture.

World Heritage

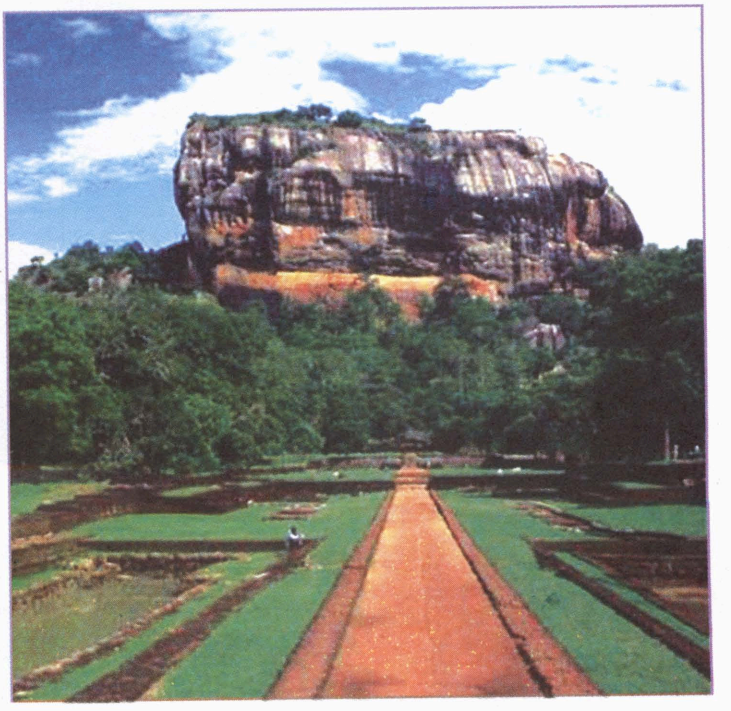
Ancient objects specific to a particular culture but of universal value can be considered as world heritage. As you have already learnt in Grade 8, heritage can be of two types, namely,

Tangible heritage – e.g. The Great Wall of China, Taj Mahal, Fortress of Sigiriya
Intangible heritage - e.g., habits and customs, traditions, languages, dances, literature.

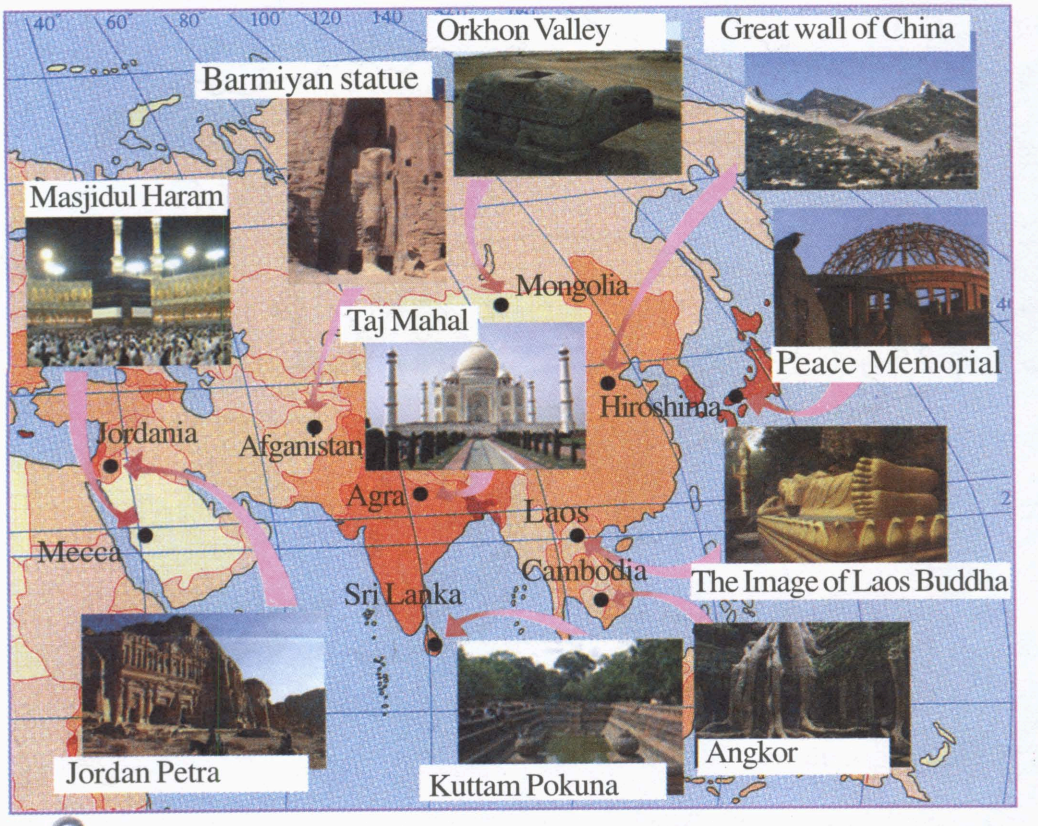
Places of cultural heritage have been useful to man in various ways as sacred places, historical places, natural scenic places and places of strategic importance. The respective countries have been able to earn an income from tourists attracted to these places. Further, these cultural heritage sites have been instrumental in giving a special identity to the Asian Region.

Figure 2.20 shows the Sigiriya fortress in Sri Lanka, which has become a world heritage. This is an isolated hill carved by nature. Because of natural protection, it had subsequently been used as a fortress. It has turned out to be a world heritage because of its cultural significance. In the Asian Region there are many other places which belong to world heritage sites. Identify some world heritage sites from Map 2.6.

Fig 2.20 : Sigiriya



Map 2.6 : Map of World Heritage Sites



Activities

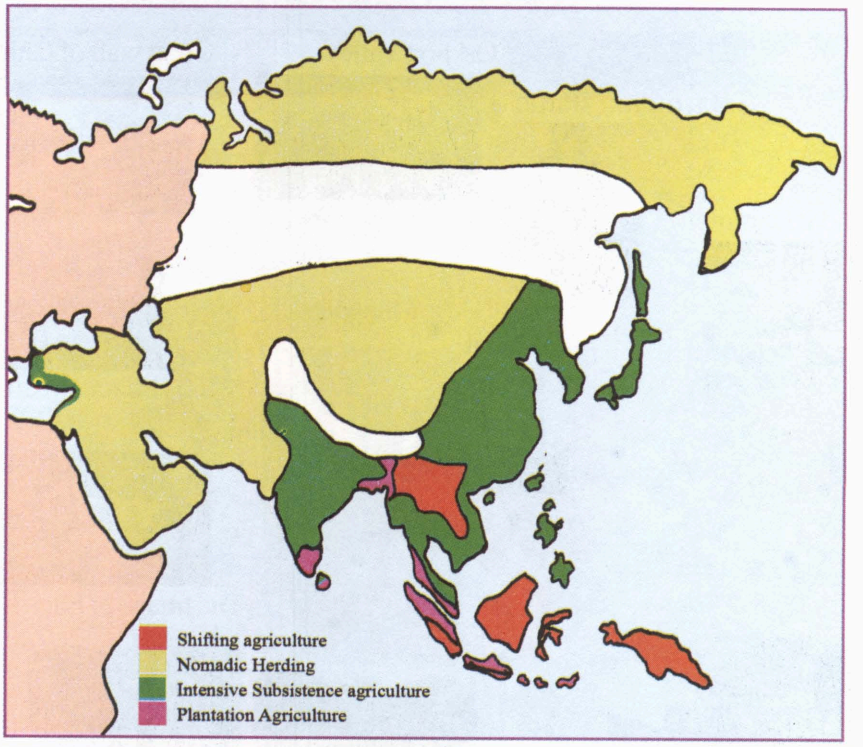
1. Prepare an article with pictures for the school magazine about the world heritage sites in the Asian Region.
2. Name two places in Sri Lanka which are declared as world heritage sites and provide a short description of them.

Agriculture

The Asian Region with a vast extent of land and a variety of climates show significant variations in agricultural activities as well. This is clearly seen from different types of agriculture found in the region (Map 2.7).

- Shifting agriculture
- Nomadic Herding
- Intensive Subsistence agriculture
- Plantation Agriculture

Map 2.7 : Agricultural types in the Asian Region



Shifting agriculture

Shifting agriculture which is one of the oldest agricultural types is declining in significance today. It is now restricted to a few areas. Jungles, scrub as well as savanna grasslands are used for shifting cultivation. The reasons for the origin and existence of this type of agriculture are seasonality of rainfall, inability to practise any other forms of agriculture on these lands and the limited resources available to the people.

Map 2.7 shows the distribution of Shifting Agriculture. This type of farming, where jungle areas are cleared by felling and burning of trees, needs rotation of lands for the conservation of soil fertility. With a view to protecting the environment, governments have taken several steps in recent years in order to,

- Minimize the destruction of forests
- Protect biodiversity and
- Prevent soil erosion
- Change these lands into permanent croplands.

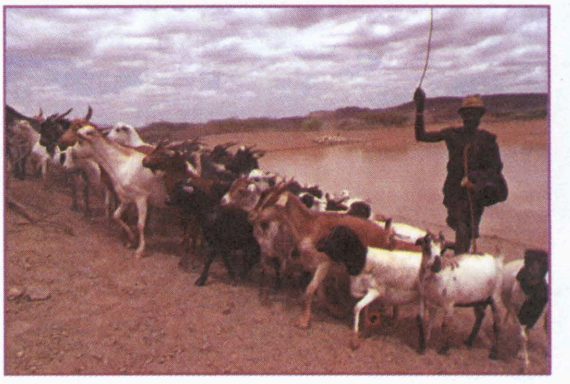
The land area used for shifting cultivation is dwindling mainly because of the demand for land created by an increasing population and conversion of these lands to permanent settlements. Among the other reasons for the conversion of such lands to permanent croplands are,

- Government policies
- Stabilization due to planting of selected trees in rows and cultivating seasonal crops in between.
- Introduction of irrigation methods.
- Usage of fertilizer and agro-chemicals
- Application of machinery and equipment, and
- Attention paid to commercial crops.

Nomadic Herding

Nomadic herding is practised in non-continuous places extending from Steppe grasslands in Central Asia to Pacific coastal areas. This activity takes place in areas bordering dry deserts where rainfall is less than 500 mm. and evaporation is high. In these areas short grasses and small plants abound. Nomadic herding is practised on hill sides unsuitable for agriculture. Animals such as goats and sheep are reared in these lands (Fig. 2.21). Permanent agriculture is carried out in oases and places with similar physical environments.

Fig 2.21 : A herd of goats



In Tundra areas in the Northern Asian Region there is the rearing of animals like Caribou reindeer because they are tolerant of excessive cold.

Although the herdsmen drove their herds thousands of kilometres for grazing in the past, environmental change and newly introduced human activities have restricted their mobility. The reasons for this situation are given below;

- Conversion of areas with adequate rainfall to permanent cropland.
- Uncertainty of rainfall in many areas.
- Planting of forests in areas on either side of the Great Siberian Railway where nomadic herding existed earlier.
- Cultivation of drought resistant crops.
- Government sponsorship of permanent settlements.

Intensive Subsistence Agriculture

Cultivation of crops and animal husbandry for consumer needs come under this type. Crops such as paddy, grains, vegetables and fruits are important in this category. Presently, several changes are taking place in subsistence agriculture. The most striking among these are,

- Modernization of farm lands
- Building specializations and
- Inclination towards commercialization
- Introduction of new crops

This agricultural system suits the physical environment of the Asian Region. Paddy cultivation is carried out in floodplains and alluvial flats where high rainfall is received. During the harvesting season, a temperature of 27^0 C is necessary for paddy cultivation. According to human needs, hill slopes are used for terraced paddy farming, provided there is an adequate water supply.

Activity

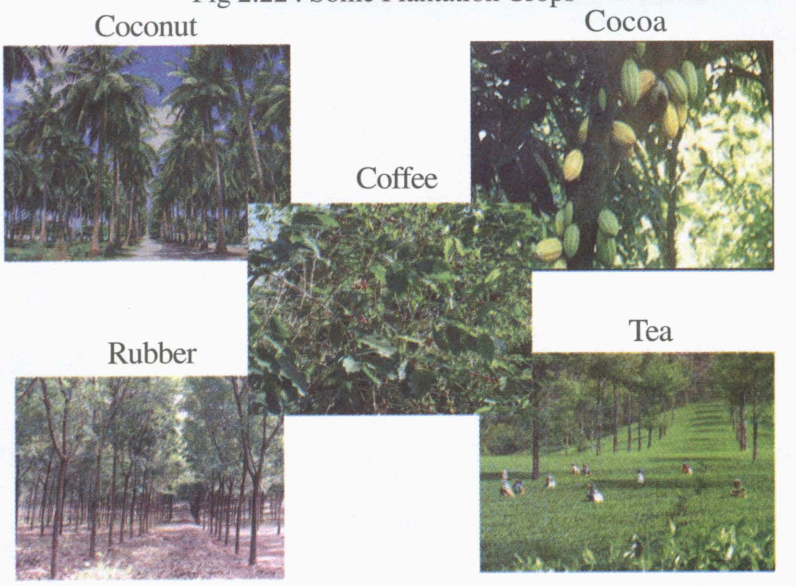
Explain the physical and human factors which account for the distribution of intensive subsistence agriculture in the Asian Region.

Plantation Agriculture

Southern and South Eastern areas of Asia are important for plantation agriculture. This system introduced by Europeans occupies an important place in the economies of the respective countries up to the present. The Europeans introduced plantation agriculture in many countries of the Asian Region because of the suitability of physical environment for this type of agriculture. Another reason was the demand for plantation products from their own markets. There are several problems facing plantation agriculture. They are,

- Presentation of primary products to the market
- Price fluctuations
- Reduced use of agricultural inputs due to the drop of foreign revenue and increasing costs
- Introduction of substitutes for products such as tea, coconut and rubber (palm oil, synthetic rubber, fruit drink etc.)
- Decrease of yields due to senility of crops.

Fig 2.22 : Some Plantation Crops



Various strategies have been adopted to minimize such problems and to increase incomes. These are;

- Diversification of crops to reduce problems emanating from the dependence on one crop. e.g., cultivation of betel and pepper in cocoa plantations and banana under coconut and rubber cultivations in Sri Lanka.
- Presenting high value added products to the market instead of traditional products. Examples: Tea cubes, Vanilla tea, green tea etc.
- Making use of the results of agricultural research (HYVs, Fertilizer)
- Employing special methods of packing when products are sent to the market.
- Sending value added products to the market instead of primary products. Examples- tyres and tubes, foot wear, toys etc. instead of rubber.

Recently, several steps have been taken to increase the yield per unit area through agricultural intensification. Many strategies have been used for this purpose.

- Establishing proper irrigation systems to irrigate crops when necessary,
- Implementing Agricultural Advisory Services,
- Introducing insurance schemes,
- Introducing high yielding varieties,
- Providing of subsidized agricultural inputs

The role of agricultural research in regard to the above is very important.

Activity

Prepare a list of problems and new trends relating to plantation agriculture in the Asian Region.

Industries

Evidence from ancient civilizations points to the fact that industries had been at a very advanced stage in the countries of the Asian region.

- There is evidence to suggest that the Indus Valley civilization had bronze, silver and clay industries. examples- the statuettes of actress and priest
- The people of the Hwang Ho valley had made finely polished stylish clay pots.
- The people in Euphrates and Tigris civilizations knew about the use of bronze.

Fig. 2.23 : Statuette of an actress

Fig. 2.24 : A panel inscription showing war and peace

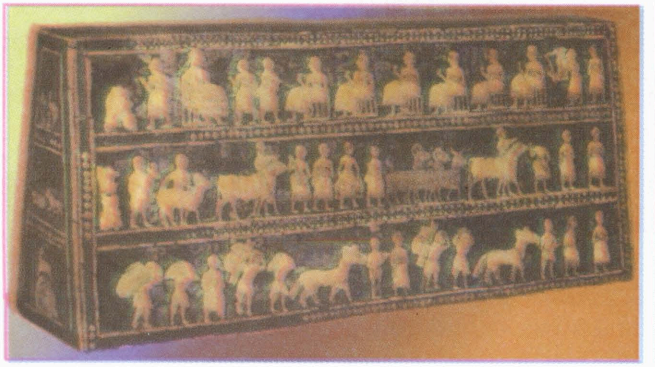
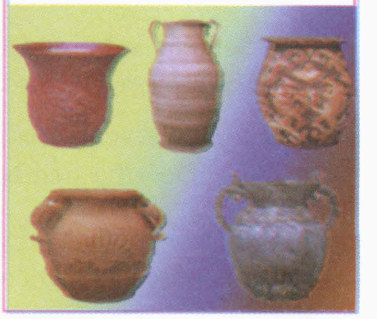


Fig. 2.25 : Chinese pots



These facts make it clear that knowledge about industries was nothing new to Asian countries. For all these industries, resources in the physical environment such as iron ore, copper, silver, clay etc. had been used. This also confirms that human activities are shaped according to the physical environment in an area.

Although industrial products were obtained in the past to primarily meet the day - to - day needs of the people and overall requirements of the country, the present policy in the Asian Region is to produce on a commercial basis for local as well as external markets.

The reasons for this are:

- The existence of natural resources such as iron ore, gold, silver, tin etc,
- Richness in fuel resources such as petroleum and natural gas,
- Availability of an abundance of labour,
- Establishment of industries by the state as well as by local and foreign companies.

At present all countries are trying to develop industries by utilizing above factors. Special characteristics of these industries are as follows :

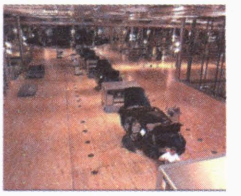
- Giving priority to import substitution in developing industries,
- Special attention given to assembly industries by countries such as Korea, Taiwan and Singapore,
- Setting up and development of special industrial zones. Examples- Damodar in India, Kobe-Osaka and Tokyo-Yokohama in Japan,
- Priority given to heavy industries by some countries e.g., Soviet Russia.

Absence of infrastructural and financial facilities necessary for industrial development has been a constraint to the development of industries in some countries of the Asian Region. Countries with infrastructural and financial facilities have established a strong industrial base although they do not have their own raw material. e.g., Eventhough Japan is without substantial physical resources it has achieved an industrial development through financial investment, new technology and improvement of labour efficiency. Multi-national companies have been attracted to the countries of the Asian Region to make use of skillful labour resources and the large market.

Fig. 2.26 : Garment industry

Countries such as China, Sri Lanka and Bangladesh have given priority to the production of garments for export. Note that China is important for heavy industries as well. Their markets are in developed countries like U.S.A., U.K. and Germany.

Fig. 2.27 : Industries and industrial countries in the Asian Region



Activity

On an outline map, mark and name five countries of the Asian Region where manufacturing industries are important.

Newly Industrialized Countries

South Korea, Taiwan, Hong Kong and Singapore which acquired a rapid industrial development in 1980s are called Newly Industrialized Countries (NICs). Many factors have influenced this achievement.

- Commencement of industries based on labour and market,
- Use of imported raw materials,
- Heavy investment by multi-national companies on these industries and transfer of new technology.

In these countries, computer and other electronic assembling industries are most important. The production of IBM computers can be shown as an example where

- Keyboards are from Singapore
- Printers are from Japan
- Software is from U.S.A and assembly is in Taiwan

Apart from the above mentioned countries China, Malaysia and India are in this group now. Countries such as India, China and Israel have started large Free Trade Zones attracting foreign investors based on open economic trade policies.

For your Knowledge
Singapore, South Korea, Taiwan and Hong Kong are called the dragons of Asia

For your information
China is called the sleeping giant of Asia

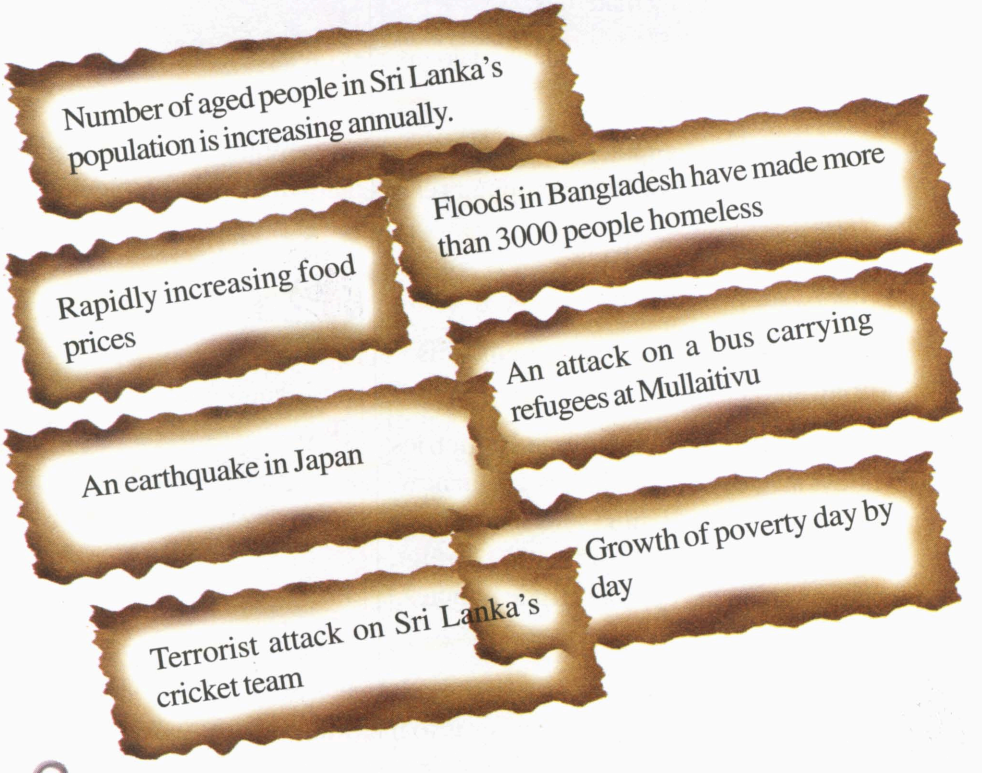
A special feature of the newly industrialized countries is to maximize on productivity with the use of least amount of raw material. As the markets are also located in Asia itself more profits could be generated. There is a great demand from developed countries as well because of low prices.

Emerging Physical and Human Challenges Faced by Asian Countries due to Physical and Human Forces

Fig. 2.28 shows a few headlines quoted from newspapers. All these news items show us that there are many challenges that Asian societies are faced with. In the Asian Region people have to face these challenges on a continuing basis. Among the challenges following are significant:

- Increase in population
- Poverty
- Political instability
- Natural disasters.
- Ensuring food security
- Problems relating to land use
- Ageing of population

Fig. 2.28 : Few news items relating to challenges



Activity

Collect information from daily newspapers about the challenges faced by Asian countries and set up a poster indicating solutions to such challenges.

For your information

Two most populous zones in the world belong to Asia.

These challenges are the result of human and physical processes. Solutions can be found for some challenges that are caused by human activities. Although we cannot prevent the challenges caused by physical processes, we are in a position to control them. Various methods have been tried out by countries by way of controls. e.g., In Japan houses are built to withstand earthquakes and dams have been constructed across the river Hwang Ho to control floods.

The challenges faced by the people of Asia have led to many problems. They are summarized in Table 2.3.

Table 2.3 : Challenges faced by Asian Countries

Challenges	**Related problems**
Increase in population	• Food shortages • Scarcity of land • Health problems • Social problems • Environmental pollution • Unemployment
Ensuring food security	• Instability in food supplies • Inequitable access to food • Use of food as a political weapon by developed countries • Rapid increase of food prices • Inability to produce to meet the demand
Poverty This is the inability to maintain a minimum standard of living	• Inability to invest in order to increase production • Deprivation of opportunities to receive a good education • Difficulty of obtaining employment owing to low level of education and lack of training • Inability to adopt new technology • Social marginalization
Problems relating to land use	• Reduction of the size of farmlands due to fragmentation of land • Persistence with traditional methods • Increase in price of inputs • Lack of facilities to access new technology • Problems relating to land tenure • Inadequate efforts to make lands productive

Ageing of population	• Increase in the number of dependents • Increase of expenditure on welfare activities • Necessity of maintaining elders' homes • Inadequate attention paid to social and legal policies pertaining to elders
Political instability	• Discourage new investments • Absence of consistent policies • Emergence of religious and tribal conflicts • Rise of minorities • Retardation of development • Demand for self-government by separatist groups. • Capture of power by the military • Displacement of sections of the population
Natural disasters	• Damage to property • Loss of lives • Devastation of farmlands and livestock • Destruction of forests • Spread of diseases • Loss of production • Disruption of daily activities • Damage to infrastructure • Loss of livelihoods • Displacement of people

Activities

1. List the problems caused by poverty in any Asian country.
2. What are the results of the increase in the number of elderly people?
3. Write three adverse results of the existence of political instability.

Steps taken to minimize challenges

It is not possible for any one Asian country to overcome these challenges single handedly. Therefore, countries have to be organized on a regional basis for this purpose. A number of organizations have been established in the Asian Region. Let us now consider what steps organizations such as SAARC, ASEAN, BIMSTEC and APEC have taken to minimize these problems.

South Asian Association for Regional Cooperation (SAARC)

Commencement - 1985 in Dhaka, Bangladesh

Fig. 2.29 : Present Member countries of SAARC

As a regional organization, SAARC has many objectives. Among these there are some objectives aimed at meeting the challenges of the Asian Region. They are as follows :

- Work towards strengthening and developing mutual trust among South Asian countries

- Make representations internationally on a zonal basis to overcome common problems of terrorism and political instability.
- Ensure food security within the region
- Establish a SAARC agricultural centre and a secure food reserve in Bangladesh
- Take decisions for the prevention of terrorism at the level of heads of state and implementing agreements for this purpose
- Take the following steps to minimize the problems relating to trade :
    1. Implementation of South Asian Preferential Trade Agreement (SAPTA)
    2. Establishment of the South Asian Free Trade Association (SAFTA)
- Alleviate poverty in the South Asian Region
- Provide financial and material aid through Japan's SAARC Country Fund and South Asian Development Fund to solve health problems and to promote the growth of the economy.

Fig. 2.30 : Heads of States who represented SAARC countries in Sri Lanka in 2008

Activities

1. With the assistance of your teacher and library books list the services that Sri Lanka has obtained from SAARC.
2. Prepare for a debate on "The aims of SAARC economic cooperation have been fulfilled/ not fulfilled"

Association of South East Asian Nations (ASEAN)

Commencement - August 1967 in Bangkok, Thailand

Fig. 2.31 : Present Member Countries of ASEAN

Among the objectives of this Association the following directly relate to meeting the challenges referred to above :

- Work towards establishing peace and stability of the region
- Provide mutual assistance at times of natural disasters
- Help economic development and promote trade
- Take the following steps to establish food security.
  - Seek assistance from New Zealand for livestock development and forest projects and aid from Canada for fishery development
  - Provide pre-natural disaster warning.

- Establish Disaster Communication Centres and the ASEAN Science and Technology Committee.
- Implement concessionary tariff policies to face challenges relating to trade

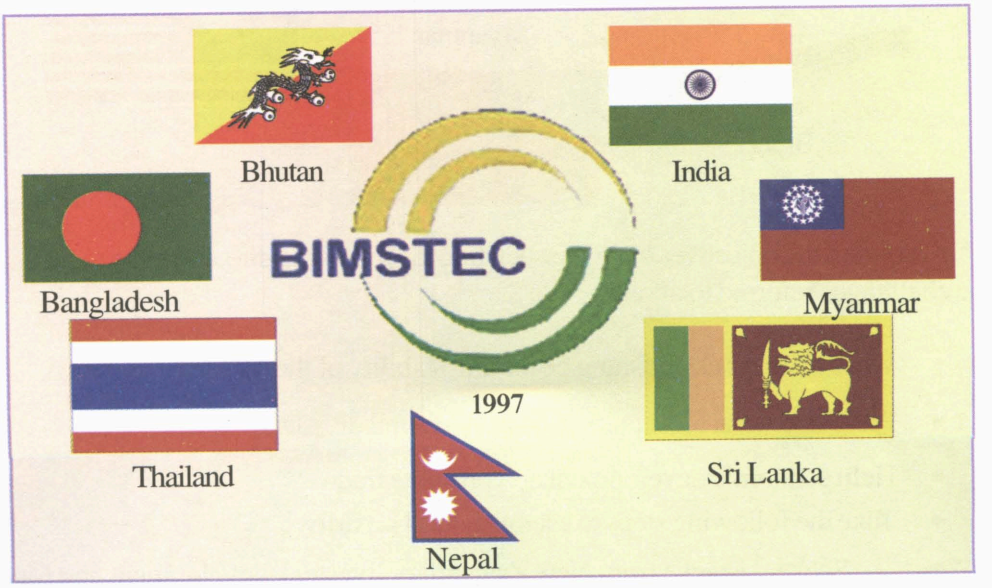
Activity

Explain the actions taken by ASEAN as a regional organization for economic and social development.

BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic cooperation.)

Commencement - This organization was originally established in 1997 by Thailand, Myanmar, Sri Lanka and India. With the joining of Bhutan and Nepal in 2004 it was renamed as.

Fig 2.32: Member countries of BIMSTEC



- Preventing terrorism and countering violence
- Paying attention to the establishment of a meteorological centre to minimize the adverse impact of natural disasters
- Improving trade and investment activities
- Improving commodity transport and communication
- Working towards promotion of tourism, fisheries and agriculture
- Following common policies collectively to alleviate poverty
- Taking action to protect biodiversity
- Taking action for the management of environmental and natural disasters.

At the 2008 convention Iftekhar Ahamed Chowdhury (Foreign Affairs Adviser to Bangladesh government) has commented that for countries neighbouring the Bay of Bengal, BIMSTEC is a strong bridge connecting South and South-East Asia. This organization has been successful in solving different problems by taking some 1.3 billion people of the South and South-East Asian Region within its fold.

Assignment

Prepare a folder giving information on, the year in which BIMSTEC was established, country participation objectives and measures adopted and assistance given to Sri Lanka.

Organization for Asia Pacific Economic Cooperation (APEC)

Commencement - APEC was established in November 1989 according to a proposal by the then Australian Prime Minister, Robert Hawke.

Member countries - What is special in this case is the inclusion of developed countries such as Japan, Australia, Canada, United States of America and New Zealand in addition to most Asian countries bordering the Pacific Ocean. Mexico, a developing country out side the Asian Region, is also included here.

Fig 2.33: Member Countries of APEC
(Asia Pacific Economics Cooperation)

As a regional organization APEC too has many objectives. Following actions directly contribute to overcome challenges faced by the people of the Asian Region belonging to APEC.

- Promotion of investment and trade within the region to minimize challenges relating to trade
- Working towards economic cooperation through unity of the Asia Pacific region (e.g., establishment of a Free Trade Zone by 2010)
- Relieving unemployment through human resource development aimed at alleviating poverty, providing subsidies to the jobless and initiating insurance schemes
- Collective decision-making by the countries of the region in order to prevent the negative effects of globalization
- Sharing of experience among countries of the region for the purpose of promoting free trade, providing technical assistance and obtaining economic assistance from the World Bank sources.

As the foreign minister of Australia has declared at the 2007 conference, through cooperation the member countries have been able to reduce poverty by 50%, double the gross national product between 1989 – 2007 and reduce tariffs on goods from 17% to 5% from 1987 to date. Accordingly, this organization has helped to promote economic rather than political processes.

Activity

Select six students to represent the six main regions in Asia and present a discussion so that information about physical and human environment is given expression

Assignment

Prepare an article to the school magazine about APEC giving information on the year of commencement, country participation, aims and objectives and assistance given to Sri Lanka.

Sources

Educational Publications Department, 1991, Social Studies, Grade 8

Educational Publications Department, 1998, Human Geography I (G. C. E. A/L)

encarta - encyclopedia - 2008

M.D Gunasena limited, 2003, New Gunasena Philips Atlas

Jayamanne Percy, 2002, Children and youth encylopedia

Sarasavi Publications, 2008, Sarasavi School Atlas

Senavirathne, Chaminda, 2002, World Organizations, i, iii

Weerathunge N.,1972, Basic Sri Lanka, World and physical geography (G. C. E.O/L)

Trewartha, V.N.H. Clendy Arthur M, Roinson, Edwin H. Basic geography, 1982,

Sinhala translation (2nd Edition)

3 Spatial Patterns of Development in Sri Lanka

"Development is the improvement of the living standard of the global community". "Improvement of the economic, social, political and cultural sectors of a country could be termed as development". You have learnt similar ideas in grade 8 as well. The purpose of this lesson is to examine physical and human processes which have influenced the spatial patterns of development in selected regions of Sri Lanka.

Human activities adapted to physical factors are found in all regions in Sri Lanka. Human needs satisfaction is planned to match the physical environment. Let us study about this aspect by going through the lesson on spatial patterns of development in Sri Lanka.

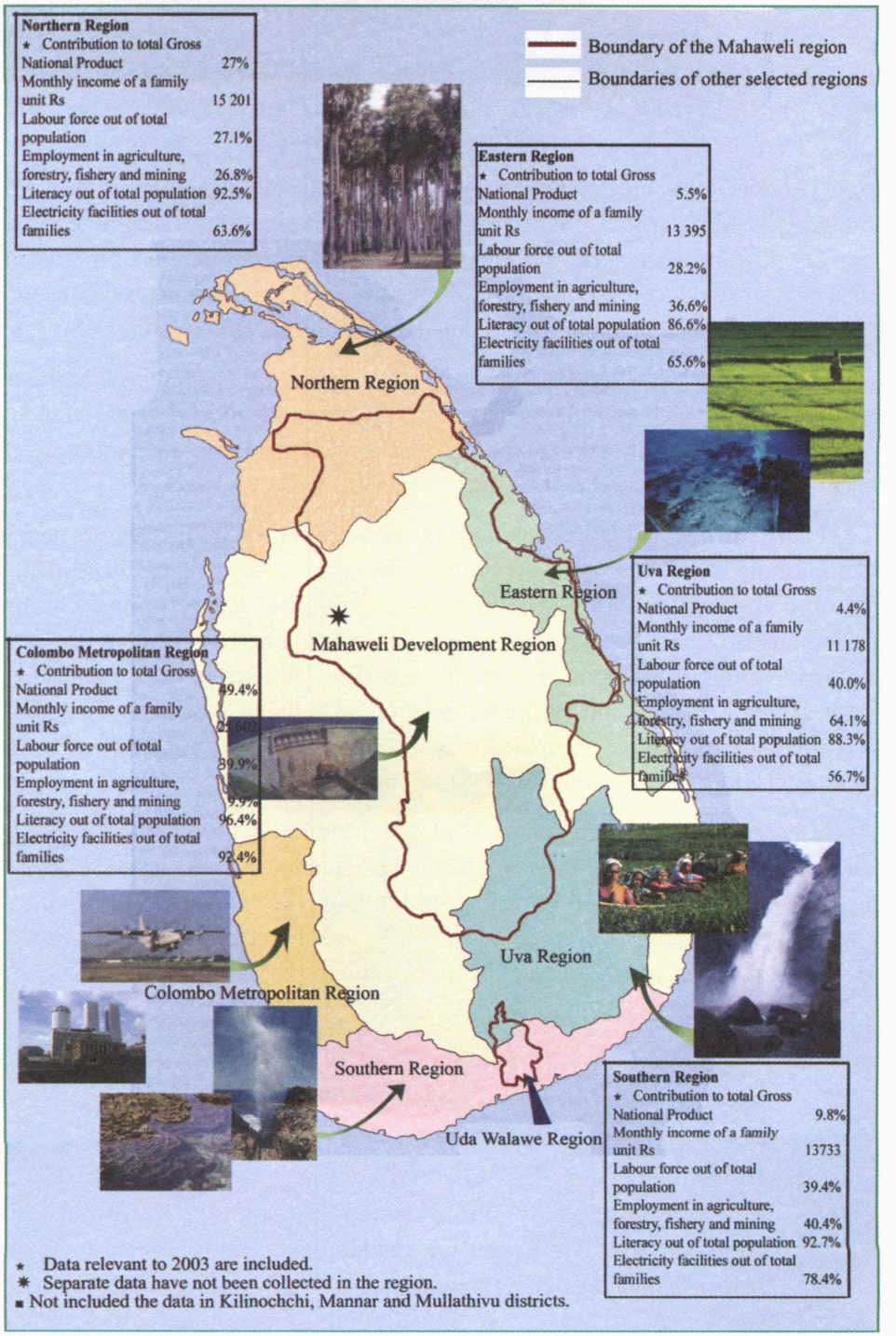
There are clear differences among the regions in Sri Lanka in terms of development. Different socio-economic levels are observed in these regions. Colombo Metropolitan Region comprising Colombo, Kalutara and Gampaha Districts and Southern Region comprising Galle, Matara and Hambantota districts have broadly similar development levels. Nevertheless, Uva Region comprising Badulla and Monaragala districts and the Eastern Region comprising Batticaloa, Trincomalee and Ampara districts have comparatively low levels of development. Gather more information about these differences by studying Map 3.1.

Variations in the spatial patterns of development in the selected regions are caused not only by the differences in the physical and human landscape but also by disparities in resource distribution. An examination of the factors relating to the physical and human landscape of the individual regions will give a better understanding of the spatial patterns of development.

You have studied the criteria to differentiate a region when you were in lower classes. Some of the criteria are given below :

1. Physical factors such as relief and climate
   (central highlands, coastal plain, wet zone)
2. Human activities taking place within physical regions
   (tea, rubber and paddy cultivation, terraced farming, *chena* cultivation)
3. Administrative boundaries, and boundaries defining service areas which help in facilitating human activities.
   (provinces, districts, city limits, communication networks, transport networks, police areas, *grama niladhari* divisions,)

Map 3.1 : Regions selected to identify spatial patterns of Sri Lanka's development



Source : Sri Lanka Socio - economic data 2007, Central Bank of Sri Lanka

Activities

1. With the aid of an atlas name three criteria used to demarcate Sri Lanka into different Regions.
2. Name the Regions into which Sri Lanka is divided according to the above criteria.

When you examine the inter-relationship between physical and human processes in the selected regions you can clearly understand the following:

1. There are similarities among regions as well as physical factors which are unique to particular regions (relief and climate found in the Uva Region are not found in the Northern Region).
2. In examining levels of development among regions administrative units with given boundaries have to be utilized for data collection (Provinces, Districts).
3. When we consider the development of the country, it is clear that the benefits of development of a particular region spill over to other regions as welfare is not restricted only to that region (entire country benefits from paddy and electricity produced in the Mahaweli Region).
4. The spatial patterns of development within regions show that the benefits are not equally distributed within the region (roads and pipe borne water facilities found within the Colombo city limits are not available in distant townships, rurban {between rural and urban} areas and rural areas in the Colombo Metropolitan Region).
5. Certain regions of the country attract human resources in a way conducive to development while in still other regions human resources tend to get pushed out. (Western Region and Uva Region respectively).
6. Differences in the distribution of physical resources result in diverse human activities.

Activities

1. "Mahaweli Development zone belongs to several regions" .Write two reasons for this.
2. Write one reason specific to each region shown in Map 3.1.

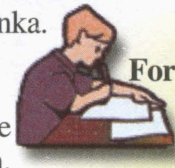
Considering all reasons indicated above, let us now examine the spatial patterns of development in selected regions of Sri Lanka.

Colombo Metropolitan Region

The wide region encompassing all these areas is known as the Metropolitan Region. Colombo Metropolitan Region includes Gampaha, Colombo and Kalutara districts.

This region is administered through,

- Municipalities
- Urban councils and
- *Pradeshiya sabhas.*



For your information

There are a number of satellite towns and rurban areas around the rapidly growing Colombo city. They have grown because of the close links to the city.

Map 3.2 : Colombo Metropolitan Region

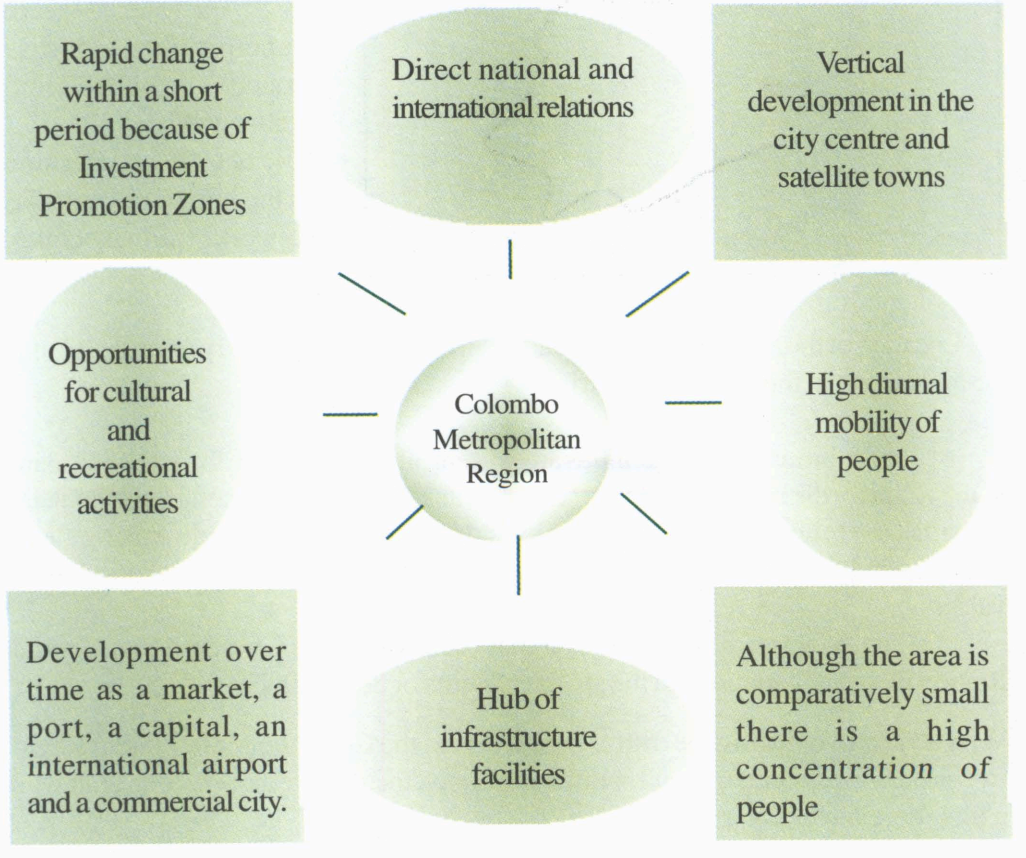
According to the Census of Population 2001, Colombo Metropolitan Region had a population of 5 648 000. The region had an area of 3593 km^2. Density of population was 1572 per km^2 (Central Bank of Sri Lanka – 2007).

Activities

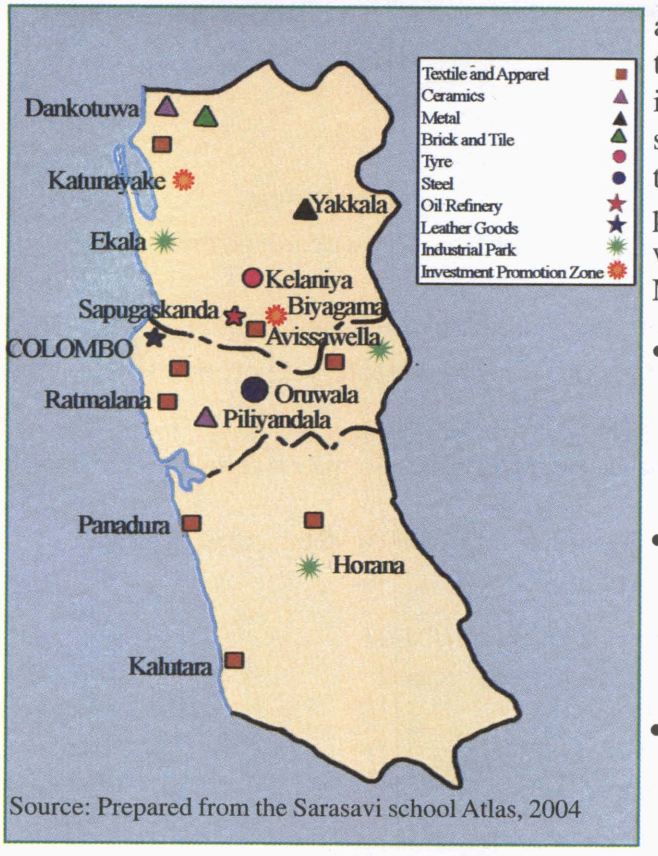
1. Name the districts in the Colombo Metropolitan Region.
2. Study Map 3.2 and prepare a list of satellite towns around the capital city of Colombo.
3. Name the two rivers bordering north and south of this region.
4. On the basis of what you have heard, prepare a report on the Colombo Metropolitan Region.

On the next day the teacher summarized the information brought by the students as follows :

Fig. 3.1 : Special features within the Colombo Metropolitan Region



Map 3.3 : Distribution of industries in Colombo Metropolitan Region



Source: Prepared from the Sarasavi school Atlas, 2004

By studying Map 3.2 and Fig. 3.1, you will be able to confirm the following information relating to the spatial patterns of development that have resulted from physical and human processes within the Colombo Metropolitan Region.

- Concentration of a large number of public sector industries in the Colombo district (tyre, iron and steel, petroleum refining)
- Location of a large number of private sector manufacturing industries around Colombo (biscuits, rubber goods)
- City of Colombo functions as the hub of rail and road networks (railway control room)
- Location of the administrative capital, main commercial city and port near Colombo and airport in the Gampaha district.

More infrastructure facilities are present in the Colombo district as compared to the Kalutara district e.g. hospitals, schools, banks, insurance offices. High population densities are found along road networks and in satellite towns while the population densities and facilities are comparatively less in isolated townships, rurban areas and villages.

These factors point to the fact that even within the Colombo Metropolitan Region there are variations in the spatial patterns of development.

With a view to reducing the traffic congestion in the Colombo Metropolitan Region overhead bridges, underground pathways and pavements have already been built while a few more have been proposed.

Activity

Prepare a folder on the Colombo Metropolitan Region on the basis of the information you have studied.

Problems faced by the Colombo Metropolitan Region and steps taken to solve them are given below.

Irregular disposal of waste matter	Recycling of waste matter Making people aware of categorizing waste for disposal Mobilizing private companies to keep cities clean
Urban congestion	Preparation of urban plans and implementing them Removal of illegal constructions and relocating new constructions elsewhere Construction of overhead bridges Developing the peripheral areas
Housing congestion	Establishment of housing schemes Replacement of houses with least amount of facilities with multi-storied flats with facilities Making credit and financial facilities available for the construction of houses
Anti-social activities	Inauguration of rehabilitation programmes for drug- addicts Introduction of educational programmes for street children Encouraging self-employment (financial assistance and training)
Environmental pollution	Making people aware of environmental conservation Proper implementation of environmental laws Implementing programmes to beautify the environment (planting trees along roads, growing flowers in limited spaces)

The aim of development is to create a good physical, social and a cultural environment

Activities

1. If you are elected president of a social organization in the Colombo Metropoletan Region, prepare a speech that you would make about the steps that you would take to develop the region.
2. List the reasons why human resources are attracted to this region from elsewhere.

Mahaweli Development Region

Mahaweli river which is 331 km. long starts from the Horton Plains and meets the sea close to Trincomalee. It is estimated that the area watered by the Mahaweli in this long journey is about 10 327 km^2.

Government of Sri Lanka which realized the importance of tapping the volume of water discharged by the river started the first phase of the Mahaweli Scheme at Polgolla and Bowatenna in February 1970. Mahaweli Development Programme that was scheduled for completion in 30 years was redesigned to be completed in 6 years and the construction work on Kotmale, Victoria, Randenigala, Maduru Oya reservoirs and the right trans-basin canal commenced simultaneously.

The Uda Walawe Scheme and Weli Oya region (renamed as System L) administered by the River Valley Development Board were also brought under the purview of the Mahaweli Authority in 1982 and 1987 respectively.

Meeting the set target, 145 593 families were settled by 2005. Out of this 90,450 were farm families while the others belonged to the categories of businessmen and those engaged in other pursuits. Hydro power generated by the Mahaweli amounted to 671 Mega Watts. During this year Mahaweli farmers obtained water for 150 598 ha.and produced 707 836 metric tonnes of paddy. This is equivalent to 21% of the total paddy production of the country (Mahaweli Authority of Sri Lanka 2005).

Moragahakanda Project proposed for the second stage of the Mahaweli Scheme was inaugurated on 25th of January 2007 to meet the needs of the country. It is nearing completion now.

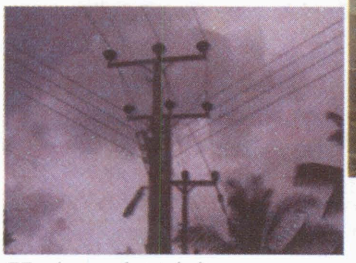
In view of the above the largest multi-purpose development scheme in the country is the Mahaweli Development Scheme.

For your information

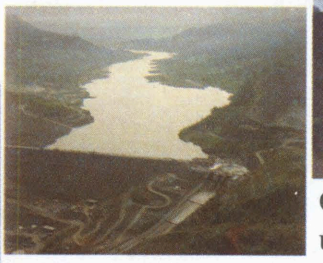
Mahaweli Development Region is not limited to the region watered by the river Mahaweli alone. This project encompasses a number of river valleys while contributing to feed others beyond its own catchment. It has also conferred direct benefits to a number of Districts and Provinces.

Let us now consider the benefits that the massive Mahaweli Development Scheme has gifted the region and the country at large. Study Fig. 3.2 and note these benefits.

Fig. 3.2 : National Level Development



Hydro - electricity generation

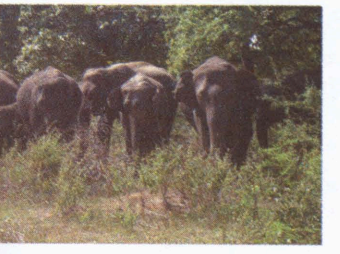


Storing surplus water, fishing industry

Conservation of the upper catchment

Water supply to existing and new farmlands

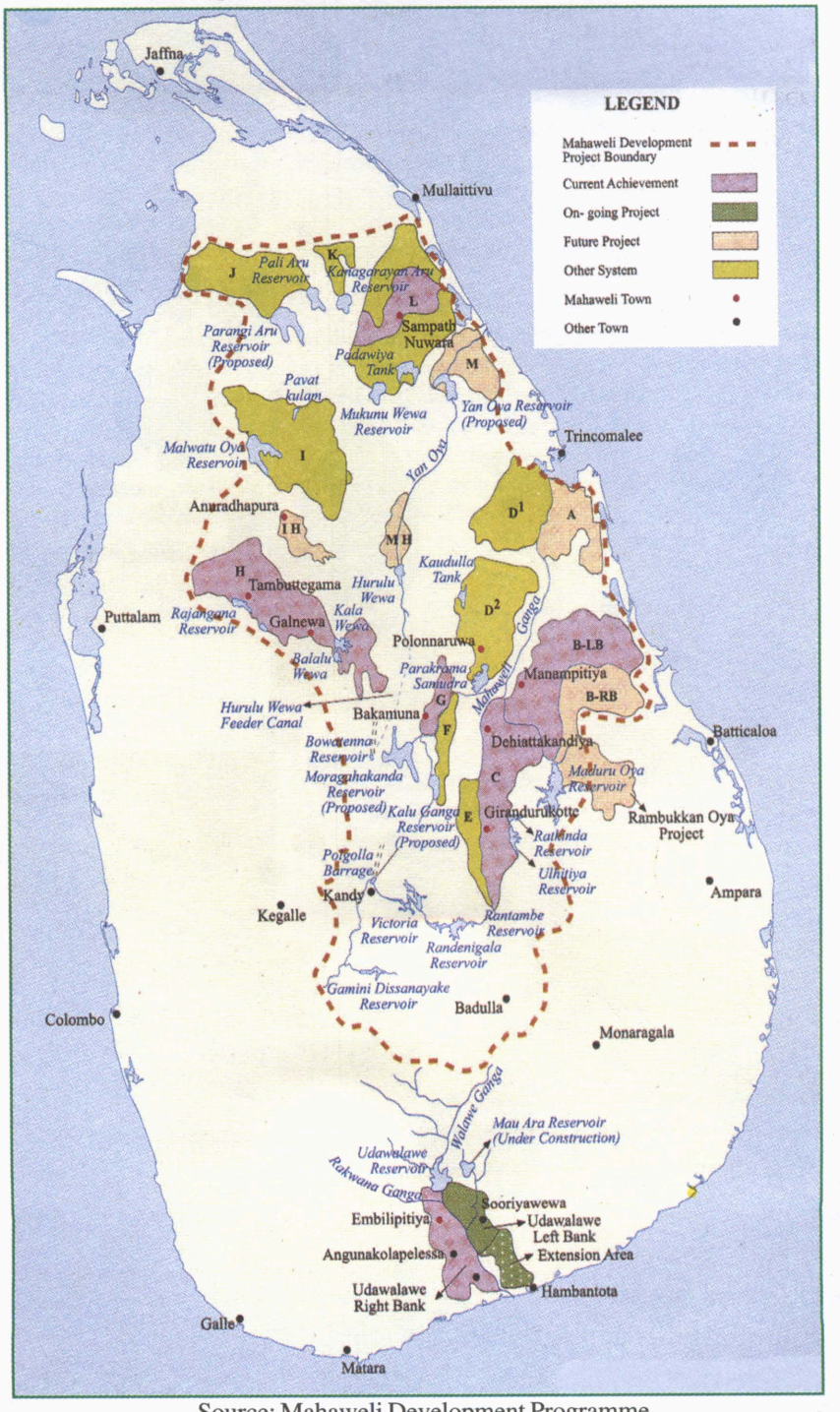
Cultivation of other crops(cashew)



Conservation of national parks

- Cultivation of export crops
- Settlement of families
- Setting up of new hamlets and new townships
- Improvement of infrastructure
- Creation of new employment opportunities

Map 3.4 : Mahaweli Development Region



Source: Mahaweli Development Programme,
Sri Lanka National Atlas (2nd Edtion)

Activity

Study Map 3.4 and complete the following Table

Mahaweli systems	Reservoirs	towns

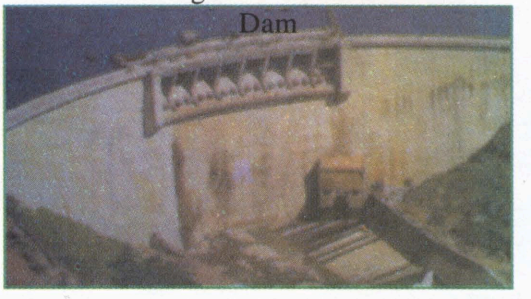
It was aimed to produce hydro-electricity from Mahaweli reservoirs as a solution to Sri Lanka's energy problem. Amount of electricity generated from Mahaweli reservoirs is shown in Table 3.1.

Table 3.1 : Generation of Hydropower through Mahaweli Reservoirs

Reservoir	Generating capacity Mega Watts
Kotmale	201
Victoria	210
Randenigala	126
Rantambe	50
Bowatenna	40
Uda Walawe	6
Ukuwela	38
Total	671

Source : Mahaweli Authority of Sri Lanka, 2005

Fig 3.3 : Victoria Dam



For your information

Hydro-electricity generated by Mahaweli reservoirs is added to the national grid and distributed throughout the country. Power generated by Mahaweli power stations accounted for 14% of national electricity production. It has been estimated that the value of power generated between 1977 – 2005 by Mahaweli power stations amounted to Rs. 132.4 billion (Mahaweli Authority of Sri Lanka, 2005).

Establishment of settlements in the Mahaweli Development Region took a different form from settlement establishment in schemes such as Gal Oya and Uda Walawe. The special feature here was the introduction of cluster settlements to enable maximum infrastructure facilities to farm families at a lower cost. New

settlements, new hamlets, new towns, new markets and new roads have been established under Mahaweli settlements.

Following family units have received priority in the settlement process of the Mahaweli region.

- Those displaced because their lands were inundated by the reservoirs
- Original settlers of the Mahaweli region
- Families selected from different parts of the country
- Non-farm families attracted to the region (to engage in manufacturing industries and business activities)
- Farm families who grow additional crops (cashew cultivation)

Among the aims of developing the Mahaweli Region were to face the then prevailing food crisis of the country and reduce the escalating prices of rice in the world market. Farm families who were settled in the region contributed to the production of rice and other field crops. Downstream areas of Mahaweli and Uda Walawe contributed towards 20 -25% of national paddy production in the year 2000 (Abhayaratna, 2005).

When the following factors are considered, the Mahaweli Development Region is of special significance as compared to other regions of Sri Lanka.

- Covers a number of Districts and Provinces
- Development aims at achieving multi-purpose development targets
- Contributes to resolve power, food and unemployment problems.

Regional variations could be seen even within the Mahaweli Development Region. For example, in downstream areas variations in agricultural patterns as well as secondary economic activities exist between the originally established System H and subsequently developed C and B Systems. Similar differences are observed in regard to road densities and growth of service centres. Downstream areas of the Mahaweli region have been more important than the upstream areas for settlement development. Most parts of the upstream areas are demarcated as conservation areas.

Activities

1. With the help of an atlas examine the course of the river Mahaweli and name the Districts and Provinces through which the river flows.
2. Mark and name three new townships of the Mahaweli Region in a map showing the Mahaweli Region.
3. Make a list of old tanks presently fed by Mahaweli waters.
4. Prepare an article titled "New Vistas of Mahaweli" and present it to the class.

After work

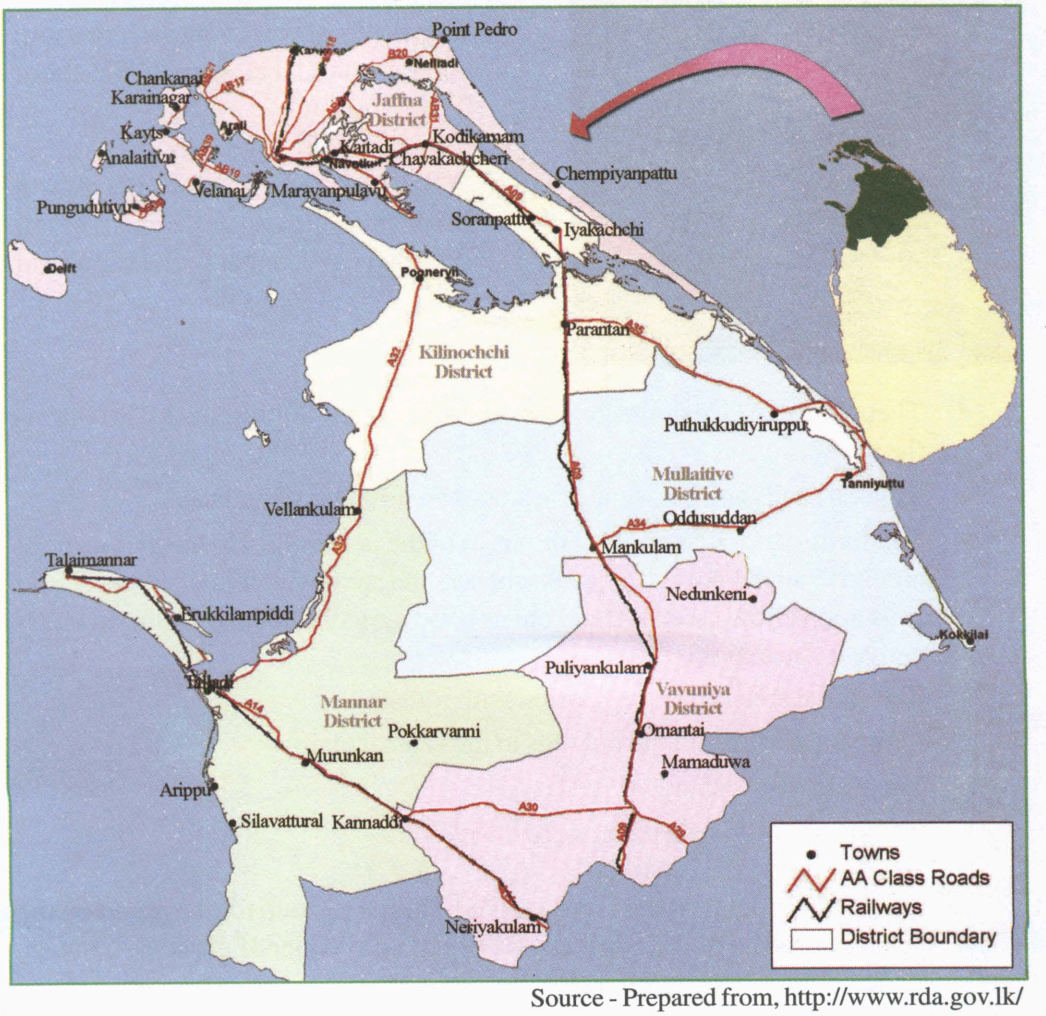
Prepare a model of a reservoir with the help of your teacher and present it to the year-end exhibition of the school.

Northern Region

As Map 3.5 shows, the Northern Region of Sri Lanka consists of the administrative districts of Jaffna, Kilinochchi, Mullaitivu, Mannar and Vavuniya together with the islands surrounding the Northern Region.

Leaving out internal water bodies the area covered by the Northern Region is 8290 km^2. Population is 1 146 000 while the population density is 138 per km^2.
(Central Bank of Sri Lanka, 2007 (estimates))

Map 3.5 : Northern Region



Source - Prepared from, http://www.rda.gov.lk/

The teacher organized groups of students to collect data on the spatial patterns of development in the Northern Region and provided them with books and journals for the purpose. The reports that were presented by the students on the basis of such material are given below. Report presented by Thilina on the physical features of the Northern Region is given below.

Let us recognize the physical environment of the Northern Region.

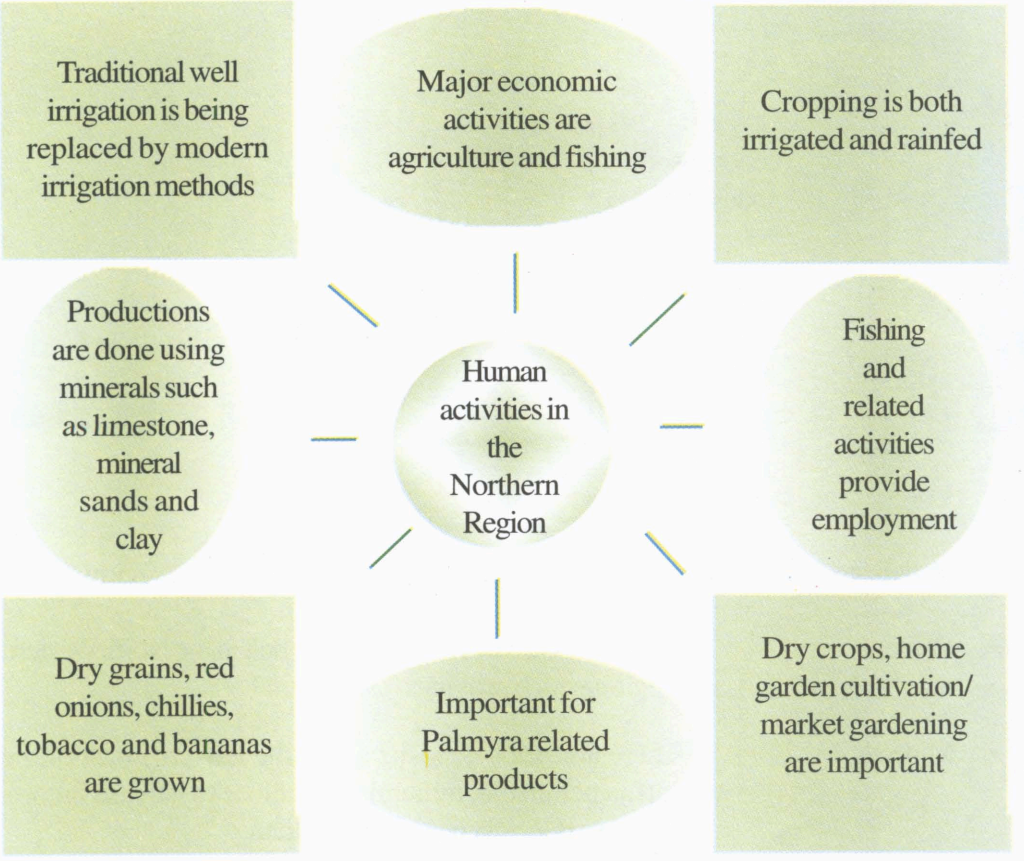
Fig. 3.4 : A palmyra tree

Characteristic features of the Northern Region

- Annual rainfall is between 1000-1500 mm.
- Most of the rainfall is received during the months of the Northeast monsoon.
- Average annual temperature is about 25^{0}C - 27.5^{0}C
- There is a long dry season
- A large proportion of the region belongs to the dry zone and a small section near Mannar to the semi-arid zone.
- There is no surface drainage. Even the small streams present, dry off during the dry season.
- Mineral sands and Miocene limestones are found in abundance.
- Soil fertility is low in most of the areas of the peninsula. However, locations around Chunnakam and Chavakachcheri and areas with fertile red calcareous soils and yellow latasols stand out as good agricultural land. Palmyra tree is native to the region.
- Rest of the area is mostly covered with forests.
- Large proportion of land belongs to the coastal plain.
- There are many islands as well.
- Fishing grounds are a resource to the region.

The other students of the class thanked Thilina's group for the report on the physical characteristics of the Northern Region. Later leader of group B, Chaturi, presented the findings of her group.

Fig. 3.5 : Nature of human activities in the Northern Region



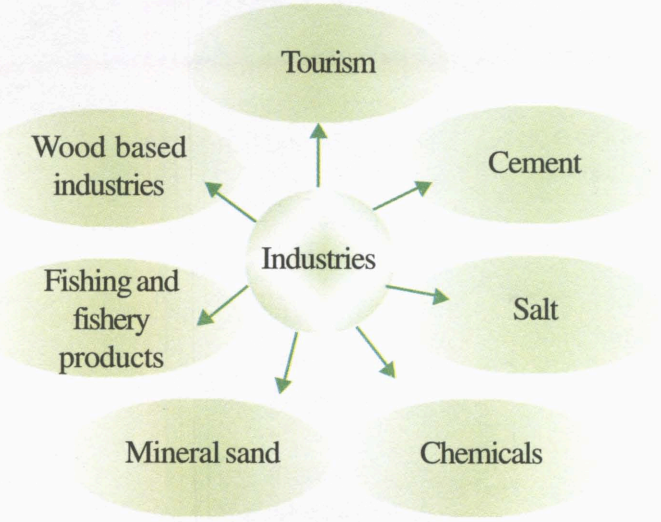
What they presented is given below.

You may have received an understanding of the physical environment and human activities of the Northern Region from these group presentations. Now try to grasp the inter-relationship between the physical and the human environment of the Northern Region from Dumindu's report.

Fig. 3.6 : Products from the Palmyra tree

Fig. 3.7 : Picturesque coastline of the North

Fig. 3.8 : Industries of the Northern Region



These industries are found because of specific physical features of the region.

- Cement - Presence of a Miocene limestone belt in the NorthWestern Region which provides raw material.
- Minerals - There are silica deposits along the Eastern coast of the Jaffna peninsula, mineral sands close to Nayaru lagoon and clay deposits near Oddusuddan.
- Fishing industry - Shallow sea, Pedro Bank and Jaffna lagoon are assets to the fishing industry.
- Tourist industry - Island studded coastline together with the Eastern coast (for bathing, diving), Chundikulam bird sanctuary, Nagadipa, Madhu church and Nallurkovil serve as tourist attractions.
- Chemicals - The only public sector chemical industry in Sri Lanka is located in Paranthan.
- Wood industries - This is the only area with the largest proportion of dry zone monsoon forests with potential for wood based industries.

However, there is no industrial production for more than two decades because of the prevailing situation in the region.

The teacher who thanked the students for their presentations provided them with more details about the Northern Region.

Infrastructure facilities

- Harbour - Kankesanturai
- Airports - Palali, Vavuniya (presently used only for defence activities)
- Major roads - Road network linked to Jaffna – Kandy A 9 road
- Railway stations - Northern line is repaired upto Thandikulam (work in Re-establishing railway link to Jaffna is in progress)
- Higher education - Jaffna University, Vavuniya University

In addition to these facilities, the residents of Jaffna use electronic communication networks to access radio and television programmes broadcast from neighbouring India. Fishing industry is fairly well developed (see Table 3.2).

Table 3.2 : Facilities provided for the fishing industry in the Northern Region

District	Fish landing centres	Ice producing centres
Mullaitivu	45	3
Jaffna	83	12
Mannar	24	3

Source : Survey Department of Sri Lanka, 1997
Sri Lanka National Atlas (School Edition)

It is possible to recognize problems and constraints when we study the spatial patterns of development in different regions of the country. This applies in equal measure to the Northern Region as well.

In the past farmers who practised traditional lift irrigation and rainfed cultivation produced small surpluses for the market in addition to meeting their requirements. At present they use modern irrigation methods and pay more attention to the cultivation of commercial crops such as chillies, red onions, vegetables, grapes and fruits.

Although there are a few industries such as cement, chemicals and mineral sands which have distinct locational advantages in the Northern Region there has been no production for nearly two decades.

The war situation and the tsunami disaster which occurred in December 2004 were instrumental in creating many problems in the region. Presently different projects are implemented for the development of the Northern Region. Among them are,

- Rehabilitation of the transport network
- Re-construction of railways including Vavuniya – Kankesanturai line
- Development of industries
- Improvement of infrastructure facilities
- Provision of facilities for the displaced people. Under the North – East Housing Rehabilitation Project (NEHRP) 31.7% of the target for 2004 -2009 had been achieved by the end of December 2007 (Nation Building and Infrastructure Development Ministry, 2008).

Accordingly, it is seen that both the government and national and international non-governmental organizations have paid attention to the development of the Northern Region. *"Uturu Wasanthaya"* (Northern Spring) development programme was launched under the present government in 2008 in order to rehabilitate the region.

Activities

1. Mark and name the distribution of mineral resources in the Northern Region.
2. Make a list of places of tourist attraction in the Northern Region.
3. Identify a few differences between the peninsula and the mainland areas of the Northern Region.
4. Prepare a folder using media information on the *"Uturu Wasanthaya"* programme implemented by the government of Sri Lanka for the development of the Northern Region.

Uva Region

The Uva Region had attained a high level of agricultural development in the days of the Kandyan kingdom. This region had also been called *"Wellassa"* due to the presence of paddy fields numbering about one hundred thousand. Mountain ranges, passes, waterfalls and escarpments provided natural protection to this region while the physical environment stood as a barrier to maintaining relationships with other regions.

This region consists of Badulla and Monaragala districts.
Apart from internal water bodies the area covered by the Uva Region is 8335 km^2.
Population is 1 257 000 while the population density is 151 per km^2.
(Central Bank of Sri Lanka, 2007)

In order to obtain information pertaining to the region the class teacher introduced Mr. Sirimal who was born in the Badulla Lunugala area and joined the staff after completing higher education. The discussion that Mr. Sirimal conducted with the help of maps and a CD was summarized on the blackboard as follows:

Let us recognize the physical environment of the Uva Region

- A large proportion of the region is between 30 – 300 m in elevation.
- Namunukula peak 2036 m high is found in this region.
- Rainfall is received from the North East monsoon and it is coincident with the major paddy cultivation season.
- Climatically the region belongs to dry montane and low country dry zone types.
- Many small and large rivers start from Welimada plateau and Namunukula range and flow in different directions.

Fig. 3.9 : Dunhinda falls

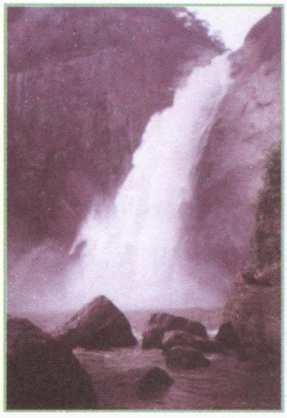


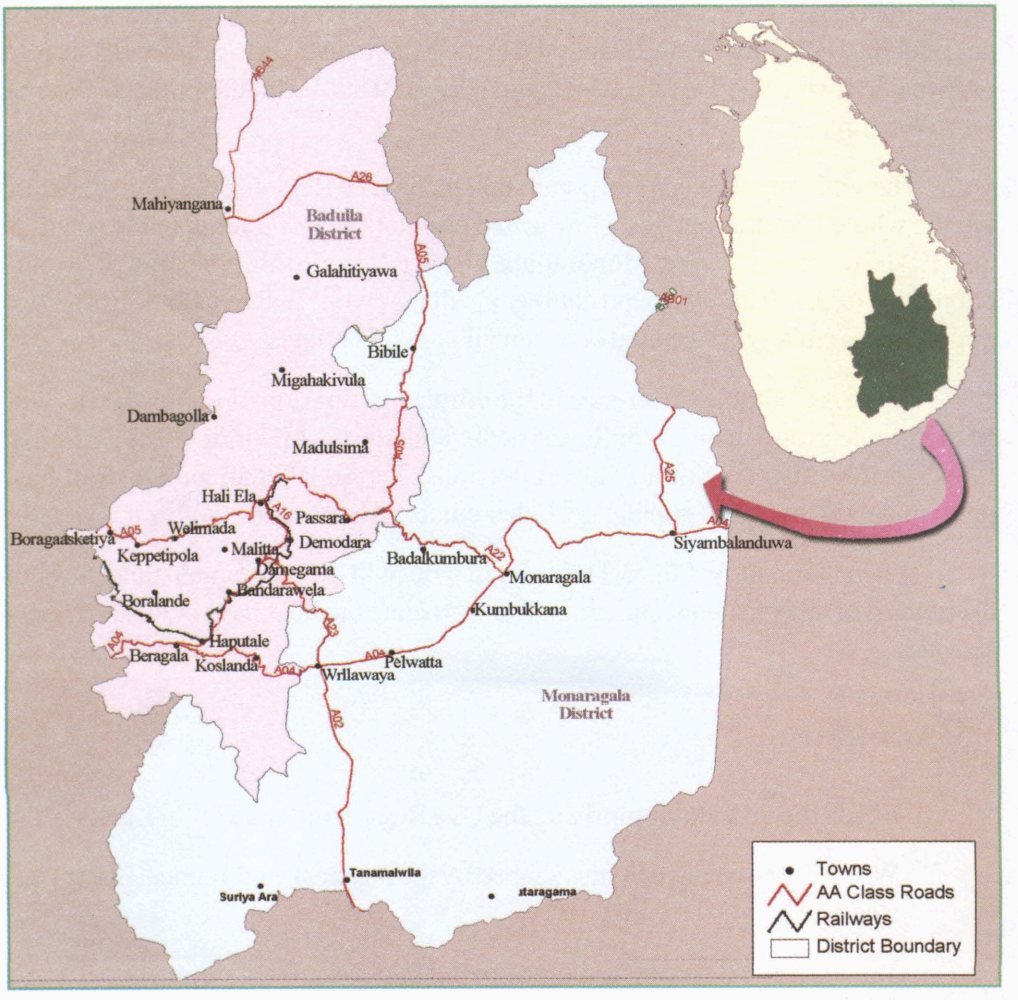
Fig. 3.10 : An area where a landslide has occurred

- Features such as mountain passes, forests, waterfalls and escarpments have given natural beauty and protection to the region. There is much potential for tourism because of the natural scenic beauty.
- Although large concentrations of minerals are absent, small deposits of precious stones, mica, iron ore and quarts are distributed.
- During the rainy season the steep slopes are subject to disasters such as soil creep, rock slides and landslides and there are many areas unsuitable for human activities.

- Unfavourable climate due to the occurrence of annual droughts in the Monaragala Region has been instrumental in pushing the human resource out of the area rather than attracting it.
- The physical environment has influenced population distribution of the region as well as human activities.

After the discussion Mr. Sirimal directed the attention of the students to Map 3.6 and further elaborated how the physical environment has influenced human activities.

Map 3.6 : The Uva Region



Source - Prepared from http://www.rda.gov.lk/

The road density of this region remains at a low level when compared with the other regions mainly because of the relief factor. Deficiencies in infrastructure are many. Except for the major roads, most of the other roads consist of narrow roads cutting across slopes. Landslides and rock falls cause difficulties in the Badulla district during the rainy season. This has exerted a negative influence on the development activities of the region. Nevertheless, Monaragala district is free of such difficulties. Remote villages away from Badulla and Monaragala urban areas have low densities of population as the infrastructure facilities are at a minimum level.

Urban population and the number of urban centres in the Badulla district are higher than in the Monaragala district. The major urban centres in the Badulla district are Badulla, Bandarawela and Haputale. In the Monaragala district Monaragala is the only major town while Passara, Medagama, Bibile, Hali-Ela and Welimada are small service centres.

The settlement pattern and population in the Uva Region also show variations. On the whole Uva Region has a low urban population. Population of the Southern and Eastern sectors of the Monaragala district is very thinly spread. The rural population of this district is found entirely in villages while in the Badulla district rural population is equally distributed between villages and estates.

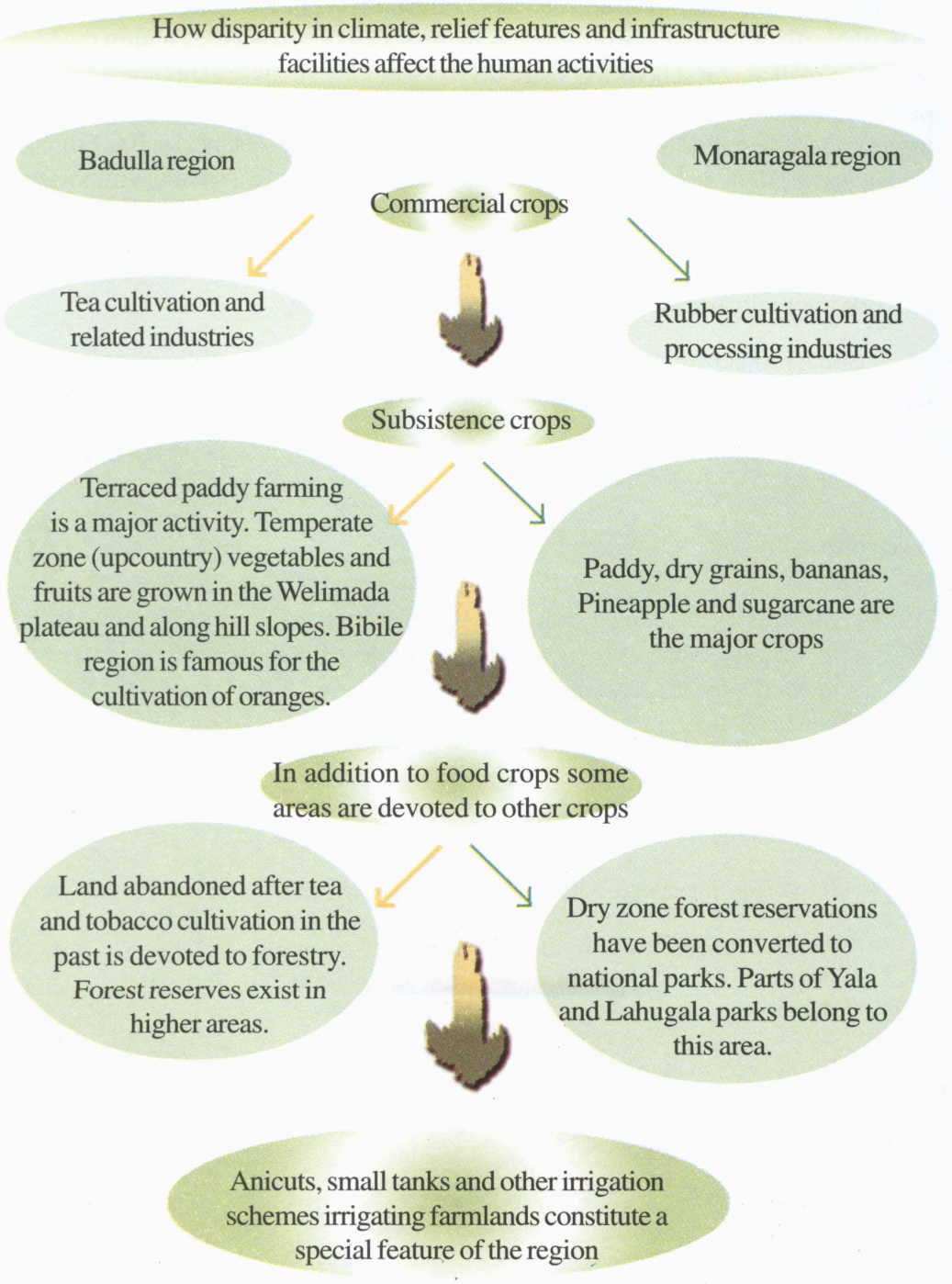
There is a notable difference in the ethnic distribution of population as well. Major ethnic group in the Badulla district is Sinhalese while Indian Tamils and Sri Lanka Tamils also constitute fair proportions. Yet the Monaragala district has a predominantly Sinhalese population. Other ethnic groups are insignificant.

When you study Fig. 3.11 in detail you will further understand how the distribution of relief features, climate and infrastructure facilities have influenced human activities.

Activities

1. Shade the districts comprising the Uva Region in a map of Sri Lanka.
2. Write three human activities shaped by the physical environment of the Uva Region.
3. What are the differences in the spatial patterns of development between Badulla and Monaragala districts.

Fig. 3.11 : Spatial Patterns of Development in Badulla and Monaragala Districts



It is important to pay due attention to irrigation methods which support agriculture. Among the irrigation methods found are large irrigation schemes, large anicuts, small tanks and small anicuts (large irrigation schemes are those which irrigate more than 80 ha.). There are differences in the use of these methods within the Uva Region. Small anicut schemes constructed by blocking small streams constitute the predominant method of irrigation in the Badulla district. These are widely used to irrigate vegetable cultivation. In the Monaragala district, major schemes such as Etimale, Yudaganawa, Handapanagala, Mahawewa and Hambegamuwa are more important.

Varied development programmes have been implemented during the last two decades to solve the problems facing the Uva Region. Village-centered projects that satisfy community needs have yielded good results.

Some projects intended to improve the living conditions of the people in the region are summarized below under the heads of agriculture, industries, infrastructure and environmental conservation.

Agriculture

- Streams are blocked by anicuts and water is taken along the contour drains to irrigate farmlands. (*Pradeshiya Sabhas* rehabilitate these irrigation networks on an annual basis).
- Protection of small holders of tea through tea small holder development societies.
- Improvement of orange cultivation in the Bibile region.
- Implementing people's livelihood development through farmer organizations.
- Inauguration of Padiyatalawa and Monaragala cashew processing demonstration and purchasing centres and planning for the establishment of seed farms.
- Improvement of marketing facilities for the products of low income receivers.
- Establishment of a sugarcane cultivation project to produce sugar.

Fig. 3.12 : Cashew Cultivation

Fig. 3.13 : Sugarcane Cultivation

Industries

- Help uplift the rural industries while encouraging private industrial entrepreneurs at the same time (apparel, textile, wood)
- Taking steps to improve the tourist industry based on the physical and historical environment of the region in relation to places of religious importance such as Muthiyangana, Mahiyangana, Buduruwagala, Maligawila and sites of attraction such as Bandarawela.
- Establishment of sugar factories at Bibile and Siyambalanduwa.

Infrastructure Facilities

- Planned development of Badulla, Monaragala and Mahiyangana towns (bus stands, hospitals, conference halls, post offices)
- Implementation of drinking water and animal husbandry projects under the Integrated Rural Development Programme.
- Implementation of community water supply and sanitation projects (water source conservation and water distribution are accomplished under these projects).
- Rural roads, irrigation and supplementary crop development project
- Establishment of rural Hydro - electricity schemes (e.g., Akiriya Unagolla, Ella Alakolagala, Yatiwara Arawakumbura.
- Improvement of facilities for higher education in the Uva Wellassa University and technical colleges for professional training.

Environmental Conservation

- Contribution to environmental conservation pogrammes (soil conservation, water resource conservation and aforestation in river catchments).

The aim of implementing these projects is to ensure an all inclusive development in agricultural, industrial and social sectors.

Both the class teacher and students thanked Mr. Sirimal for making an excellent presentation as someone familiar with the region.

Activities

1. Give three reasons for the absence of rapid development in the Uva Region when compared to other regions.
2. Prepare a list of vegetables and fruits grown in the Uva Region.
3. Write an article to a wall paper on the title "Natural beauty of the Uva Region attracts us".

Southern Region

Let us now look at the Southern Region under spatial patterns of Sri Lanka's development.

The Subject teacher gave an opportunity to the students to listen to a CD broadcast titled "Forward Vision of Southern Sri Lanka" produced by the 12 – 13 grade media unit of the Sinhapura Maha Vidyalaya.

Announcer

Ayubovan to all of you. I welcome specially the invited guest to the studio, Mr. Kulatunga who is the executive director in charge of development in the Southern Region.

Mr. Kulatunga

Ayubovan !

Announcer

Let us first of all sort out what the Southern Region is.

Mr. Kulatunga

Yes, this region consists of Galle, Matara and Hambantota administrative districts. Except for the internal water bodies the area covered by the Southern Region is 5383 km^2. According to the Socio-economic data of the Central Bank of Sri Lanka the population of the region is 2 391 000 while the population density is 444 per km^2.

Announcer

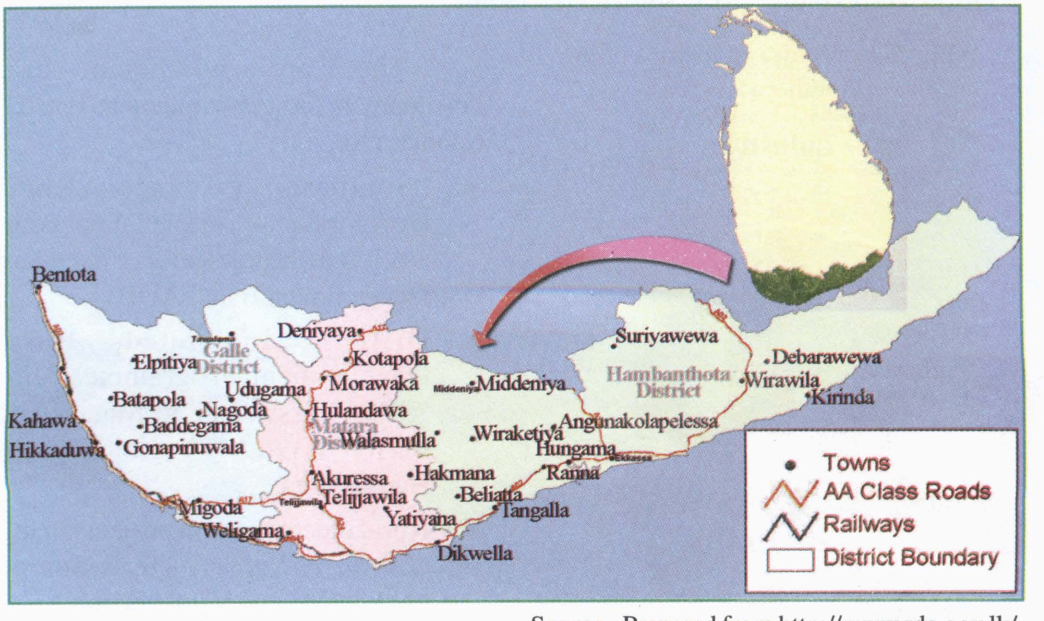
Mr. Kulatunga, please give us some details about the geographical background of the region as well.

Mr. Kulatunga

According to the climatic divisions Galle belongs to the wet zone, and Hambantota to the dry zone while Matara belongs to both.

- Rainfall of Galle and Matara is between 1500 – 4000 mm. and both districts are subject to floods annually. Hambantota receives an annual rainfall of 750 -1500 mm. The people have to face a dry season exceeding four months.
- A special feature is the picturesque long coastline.
- According to relief the coastal belt is a plain while highlands are found in the interior.

Map 3.7 : The Southern Region



Source - Prepared from http://www.rda.gov.lk/

- Presently, the region is making new progress under the Southern Sri Lanka Development Plan. According to the physical environment of the region a diversity is seen in human activities. The coastal plain shows high densities of population while highlands in the interior record low densities.

Announcer

What are the physical resources of the region?

Mr. Kulatunga

Graphite, mineral sands along coastal areas, coral and limestone, gems, kaoline and clay suitable for tiles are found in the region. This is an area which can be developed by rainfed cultivation as well as by providing irrigation facilities.

Activities

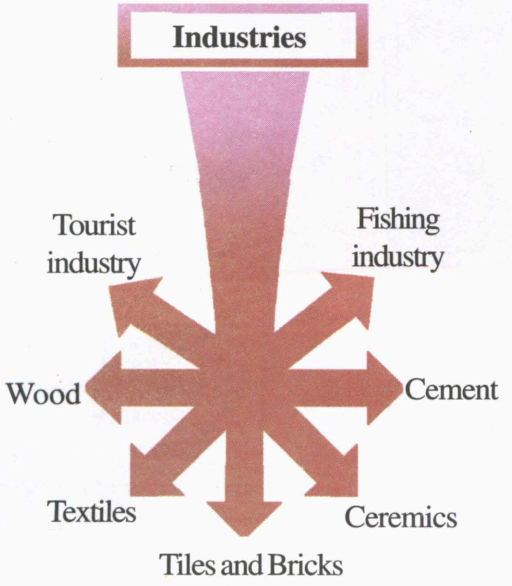
1. Mark and name the districts of the Southern Region of Sri Lanka in a map showing province and district boundaries.
2. Name the climatic zones to which this region belongs.

Mr. Kulatunga who provided basic information about the Southern Region distributed many leaflets among the students for them to gather additional information.

With the help of those leaflets and teacher's guidance the students classified information about the development of the Southern Region of Sri Lanka.

Major Industries of the Southern Region

Fig. 3.14 : Major Industries of the Southern Region



There are a number of rural development projects implemented in the Southern Region :

- "Southern Province Rural Development Project" launched in 1991 with the assistance of the Asian Development Bank (ADB).
- District Integrated Rural Development Programmes with "SIDA" assistance in Matara and with "NORAD" funding in Hambantota.
- Rural electrification projects in the *Grama Niladhari* Divisions of Lankagama and Varukandeniya and the thermal power station at Nadugala.

- Reconstrucion of roads
- Repair of existing bridges and new constructions (Matara – Mahanama bridge)
- Minor irrigation projects
- Projects to prevent salt water intrution into lands
- Establishment of fishing villages and fishery societies
- Rearing of lobsters under the new Casita technology.

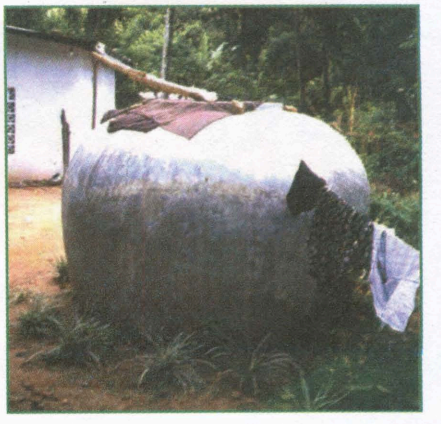
In addition to the above, Colombo – Matara highway is being constructed to cut across the region while stage I of the Matara – Kataragama proposed railway line is nearing completion up to Dikwella. All these projects were aimed to develop the villages and village infrastructure.

Development of the Southern Region was greatly retarded because of the tsunami disaster which occurred on 26th of December 2004. In the event many philanthropists both local and foreign and governments gave much financial and material support as well as technical and labour assistance to Sri Lanka. In addition, steps were taken to demarcate a reservation of a 100 m width and develop the coastal zone and to establish a pre-tsunami warning system. Further an accelerated development project named Southern Lanka Development has been implemented by the government of Sri Lanka. A re-awakening of the region was expected through the reconstruction of destroyed road networks and harbours as well as the development of agriculture and fisheries which were undertaken with the assistance of this project.

Try to understand the development of the Southern Region with the help of facts organized under different heads.

Fig. 3.15 : Building of rain water tanks

Fig. 3.16 : A tank collecting rain water



Improvement of infrastructure facilities

- Rebuilding the destroyed railway line using local technology and labour
- Reconstruction of destroyed roads and bridges
- Hambantota international harbour and the new city is under construction
- The proposed airport at Thanamalwila, Mattala will be upgraded to international standards
- Improvement of the road running through Galle, Matara, Hambantota, Thanamalwila
- Development of the forts of Galle and Matara
- Development of fishery harbours at Galle, Weligama, Dondra and Hambantota.

Social development

- Rehabilitation of the destitute with the intervention of the government and re-settlement of families whose houses and property had been destroyed by tsunami
- Improvement of the Ruhuna University
- Introduction of rain water tanks to the drought-stricken people in Hambantota through Secondary Towns and Community Water Supply and Sanitation Project.

Fig. 3.17 : A Bus Stand

Fig. 3.18 : Development of the Hambantota Town

Development of Agriculture

- Development of coconut cultivation in the coastal belt and naming Ranna, Thangalla and Middeniya in the Hambantota district as the mini coconut triangle for the development of the cultivation.
- Introduction of palmyra as a new cultivation in the Hambantota district.

Fig. 3.19 : Cashew Products

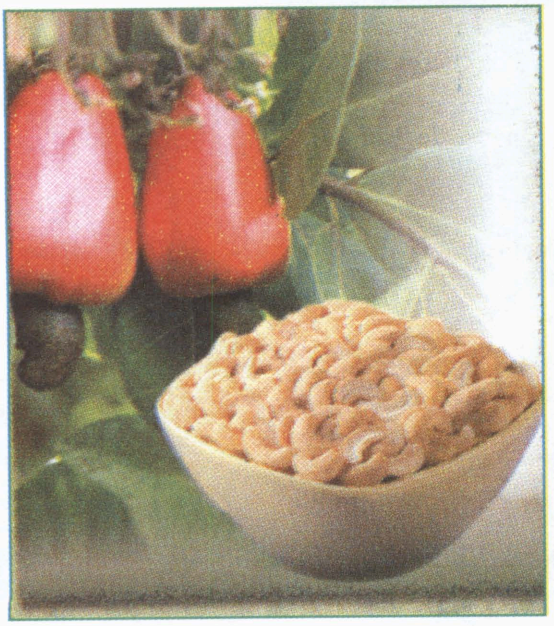


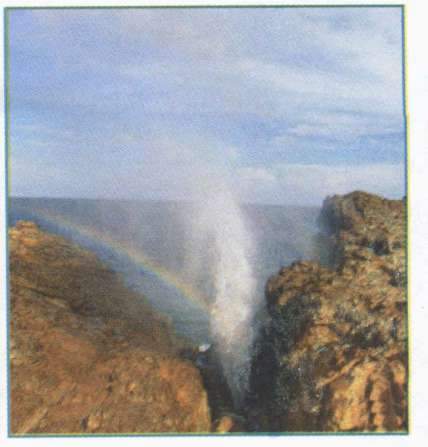
Fig. 3.20 : Sugarcane Cultivation

- Supporting small holders in Galle and Matara districts by providing credit and advisory services for the cultivation of tea, rubber and cinnamon.
- Extending facilities to farmers through agrarian service centres for crops such as pepper, coffee to be grown under coconut.
- Cashew cultivation together with coconut in the Hambantota district.

Places of Tourist Attraction

Fig. 3.21 : Corals at Hikkaduwa

Fig. 3.22 : Hummanaya (Blow Hole)



Human activities have been adapted to exploit the particular advantage of such sites. Construction of hotels for tourists and generation of related employment such as trading, driving and guiding could be cited as examples.

These projects also indicate that the human activities are shaped by the physical environment of the region.

Problems faced in implementing development plans in the Southern Region

- Problems relating to obtaining land for development activities, widening of roads and new constructions
- Inability to attain the objectives of the Nilwala Ganga flood protection scheme
- Salinization of large extents of land
- Lowering of the ground water table
- Fallowing of old farmlands.

The government has already accomplished the granting of alternative lands and payment of compensation to those who were deprived of their lands because of development projects.

Activity

Mention three reasons which are responsible for variations in development within the Southern Region.

After work

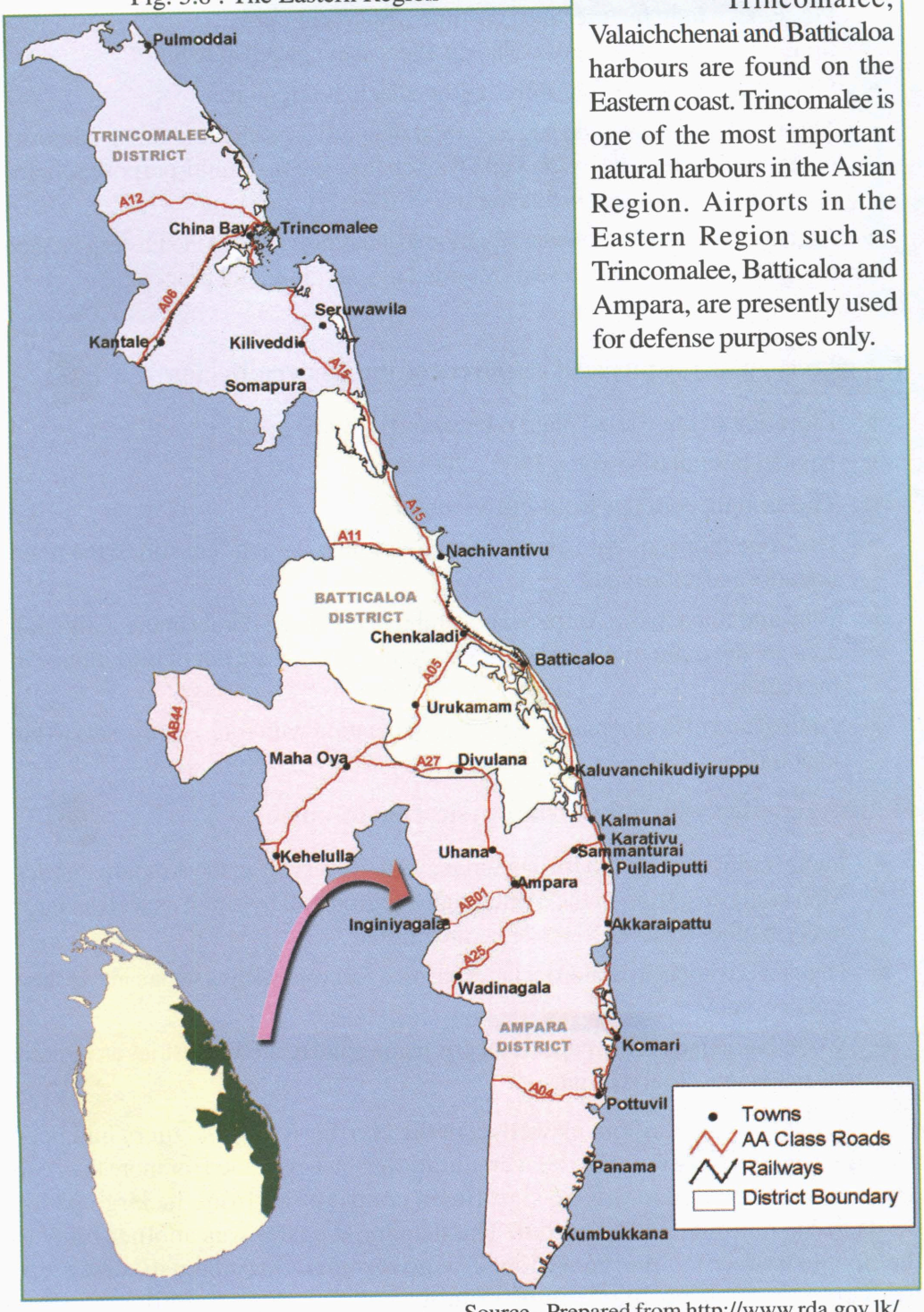
Collect information on more development projects nearing completion in the Southern Region under the present government.

Eastern Region

This region consists of Trincomalee, Batticaloa and Ampara districts. Eastern Province is the largest province in Sri Lanka. Except for internal water bodies the area covered by the Eastern Region is 9361 km^2, which represents 26% of the total land area of the country. Population is 1 578 000 and it is equivalent to 7.9% of the country's population while the density is 169 per km^2 (Central Bank of Sri Lanka, 2007).

Fig. 3.8 : The Eastern Region

Trincomalee, Valaichchenai and Batticaloa harbours are found on the Eastern coast. Trincomalee is one of the most important natural harbours in the Asian Region. Airports in the Eastern Region such as Trincomalee, Batticaloa and Ampara, are presently used for defense purposes only.



Source - Prepared from http://www.rda.gov.lk/

- Possesses a long picturesque coastline which is about ¼ the total coastline of Sri Lanka. Majority of the coastal dwellers are engaged in fishing.
- Sinhalese, Tamils and Muslims live together in this region.
- This region possesses the largest extent of paddy land in the country. Majority of the paddy lands fed by the Gal Oya Scheme, the first multi-purpose scheme of Sri Lanka, are found in this region.
- As in the Northern region war situation that has prevailed in the Eastern Region for more than two decades has retarded the development process.

Let us recognize the physical resources of the Eastern Region

- Elevation of the coastal plain is between 0 – 30m.
- Annual rainfall is between 1500 – 2000 mm.
- The drought period is from 2 to 5 months.
- Dry zone monsoon forests and mangroves near lagoons constitute the main natural vegetation types.
- Clay and mica in the Ampara area and live and dead corals in the Kalkudah area are the main mineral resources. Other minerals are not of importance in the region.
- Animal and bird sanctuaries found in association with forests are assets to the region.

Human activities with links to the physical environment

- Paddy cultivation is fed by the Senanayake Reservoir in the Ampara district, Mahaweli irrigation in the Trincomalee region and by small as well as large tanks in other regions. Some areas are rainfed.
- Highlands without irrigation facilities are used for crops such as sugarcane, cashew and dry grains.
- Wood-based industries, paper industry, fishing and related industries are among the major industrial activities.

In the Eastern Region, as well as in the Northern Region, there had been no industrial output owing to the war situation which prevailed for more than two decades. Similarly, there was no significant contribution from the large paddy tracts to the national paddy output. The tsunami disaster was another blow to the people worsening their position. The government has taken diverse steps to overcome such problems and promote a development similar to other regions of Sri Lanka.

There are 1 750 000 ha. suitable for paddy and 281 600 ha. of highlands in the Eastern Province. This province produces 25% of the national paddy requirement. Yet only 50 – 60% of the lands are cultivated. It is planned to cultivate 17,355 h.a. (42 886 acres) of fallow lands during Maha 2008 – 2009 (Ministry of Nation Building and Estate Infrastructure Development, 2008)

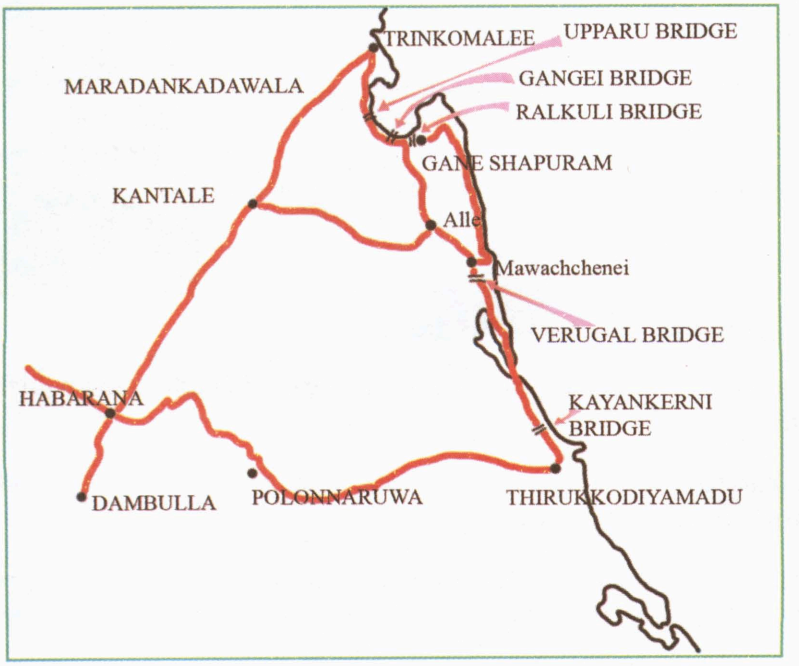
Nagenahira Navodaya (Reawakening of the East)

A reawakening of the region is evident with the *Nagenahira Navodaya* Development Programme. The related development can be summarized under different heads.

Rehabilitation of road networks under infrastructure development

- Habarana – Kantalai road (44 km.)
- Allai – Kantalai road (42 km.)
- Trikkandimadu – Trincomalee road (99 km.)
- Mavachchenai – Ganeshapuram road (33 km.) and construction of new bridges at Kinniyai, Oddamavaddi and Arugam Bay.

Map 3.9 : Road Development in the Eastern Region



Source : Ministry of Roads and Road Development

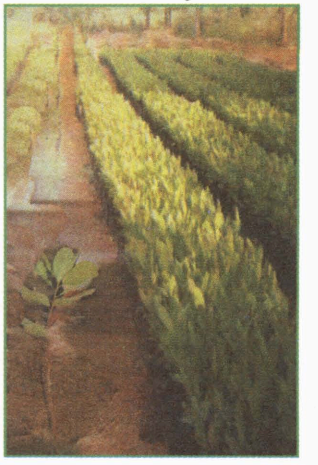
Fig. 3.23 : Collecting the harvest of paddy

Development of Farmlands

After re-establishing a democratic administrative system in the east, a programme to improve paddy cultivation had been launched covering the entire Eastern Region. This included the distribution of fertilizer and seed paddy. Harvesting of the 2007 – 2008 Maha season paddy crop was done ceremonially.

It is expected that this production will continuously add to the national output. It is also expected to obtain ¼ of the national maize production from the Eastern region.

Fig. 3.24 : A Cashew Plant Nursery



Cashew and Palmyra Cultivation Project

- Cultivation of 25 000 plants in the Ampara district and about 12 000 plants in Kadjuwatta Army Camp in 2007 with the participation of community based organizations.
- Growing of palmyra and cashew for the protection of the coastal belt.

(Ministry of Additional Plantation Crop Development)

Sugarcane Cultivation

- Commencement of the Hingurana sugar factory in partnership with the private sector.
- Popularization of sugarcane cultivation among the farmers by providing them with infrastructure facilities.
- Introduction of sugarcane having an economic importance to lands experiencing water deficiencies for paddy cultivation and establishment of sugar, treacle and jaggery making industries.

Helping the Fishing Industry

- Construction of new fishery harbours
- Improvement of existing harbours
- Modernization of Valachchenai fishery harbour with the assistance of the Asian Development Bank (ADB) and public investment.
- Provision of boats and other equipment to fishermen
- Development of eastern fishery harbours under *Thotupola Aruna* programme.

Fig. 3.25 : A Fishery Harbour

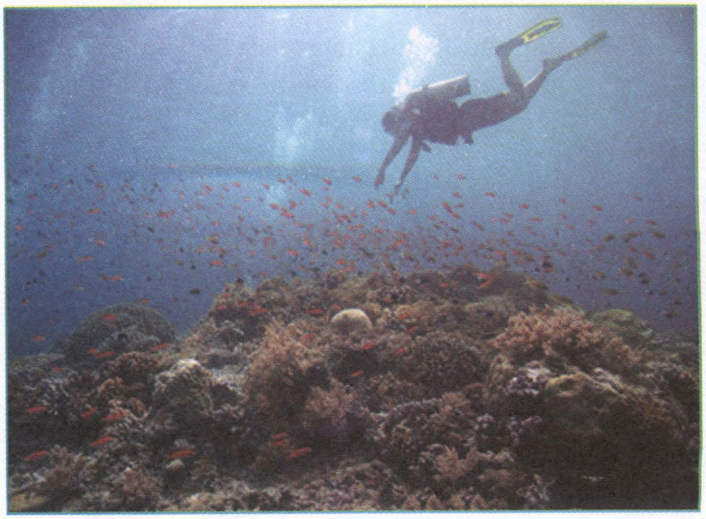
Development of the Tourist Industry

- Somawathiya sanctuary
- Kumana bird paradise
- Diving locations such as, Kalkudah, Passekudah and Batticaloa; Vakarai coastal resort; places of archaeological significance such as Seruwila and the Dutch fort; Kinniya hot water springs are places of tourist attraction.

Historic places of religious importance like Seruwila and Dighavapi, Hindu places of worship such as Koneshwaram in Trincomalee and Thirukkovil in Ampara have given a cultural significance to the region.

It is expected to direct development of the Eastern Region in a way that both the region and the country at large could gain benefits.

Fig. 3.26 : Diving in the Eastern Sea



In order to make all development efforts successful, it is very important to ensure the security of the Eastern Region.

Resettlement Programme

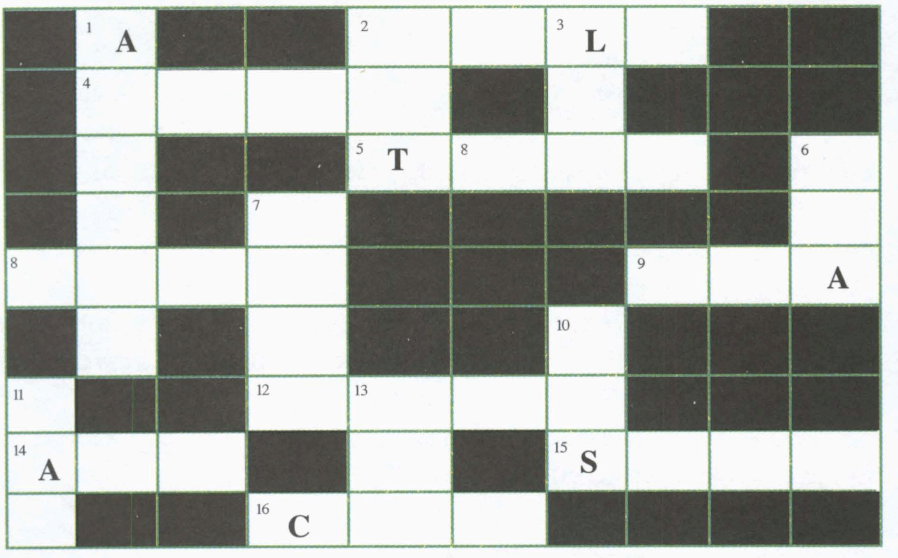
Resettlement of people commenced with the dawn of peace and 41.3% of the target for 2004 -2009 under the North – East Housing Rehabilitation Project (NEHRP) had been achieved by the end of December 2007 (Nation Building and Infrastructure Development Ministry, 2008).

Activities

1. Prepare a field book giving details of the *Nagenahira Navodaya* Development Programme.
2. Make a list of products that find their way to different regions from the Eastern Region.
3. Describe briefly how cooperation among people influence development.
4. Write a few regional variations in development within the Eastern Region after discussing with your teacher.
5. Write five ways in which the tsunami affected the Eastern Region.
6. I. Make a tour to see one or more regions shown in Map 3.1
   II. Prepare a folder about the development of the regions you visited on the basis of the information collected during the tour and details obtained through the media.

Copy the following cross word puzzle into your exercise book and fill it.

With the assistance of your teacher check whether you have been successful in filling the cross words.



Across

2. A source of water for the villages
4. Husked paddy
5. An urban place smaller than a city
8. A mode of transport
9. An important crop in the hill country
12. Cropping season which coincides with the dry season
14. Another word for stream
15. A product obtained from sea water
16. Shortened form for the Colombo Metropolitan Region

Down

1. Name of a bay in the eastern coast
2. One of the climatic zones in Sri Lanka
3. Opposite of the word "high"
6. One of the provinces in Sri Lanka
7. Raw material for making tiles and bricks
10. One of the major sources of power
11. A coastal feature
13. Another word for "objective"

Sources

ශ්‍රී ලංකා මහ බංකුව, 2007, සමාජ ආර්ථික දත්ත

එම් ඩී ගුණසේන සමාගම, 2003, නවීන ගුණසේන පිලිප් ලෝක සිතියම් පොත

අධ්‍යාපන ප්‍රකාශන දෙපාර්තමේන්තුව, 1998, උසස් පෙළ මානුෂ භූගෝල විද්‍යාව I

ශ්‍රී ලංකා මහවැලි අධිකාරිය, ප්‍රගති පාලන ඒකකය, 2005 සංඛ්‍යා ලේඛන

ජාතික ජලසම්පාදන හා ජලාපවාහන මණ්ඩලය, වැසිදිය රැස්කිරීමේ තාක්ෂණය සහ වැසිජල රැඳවුම් ටැංකි නඩත්තුව පිළිබඳ (දිනය සඳහන් නොවන) අත්පොත

අතිරේක වැවිලි බෝග සංවර්ධන අමාත්‍යාංශය, උක් තල් හා කජු ත්‍රිත්වය ජාතික තලයට (දිනය සඳහන් නොවන) අත්පත්‍රිකා

නාගරික සංවර්ධන අධිකාරිය, 2009, නාගරික සංවර්ධන හා පූජාභූමි සංවර්ධන අමාත්‍යාංශය, අත්පත්‍රිකා

මහා මාර්ග හා මාර්ග සංවර්ධන අමාත්‍යාංශය, 2009 පෙබරවාරි 17 දිනමිණ, සියවසක ජාතික මෙහෙවර අතිරේකය

Abhayaratna, M.D.C., 2005, "Regional Development Implications of the Accelerated Mahaweli development Project", in M.M. Karunanayake and Anders Narman (Eds) Regional Development in Sri Lanka: Resetting the Agenda, University of Sri Jayewardenepura, Sri Lanka.

4. Environmental Ethics and Development

Although the interest in environmental ethics found today has come about in the last few decades, man's understanding of the environment and living in harmony with it is as old as the history of humanity. Yet the demand created for goods and services as a result of the rapid population increase in recent years has necessitated an accelerated material development causing undesirable environmental effects.

The problems created by the rapidly expanding agriculture and industries as a result of new technology not only disturbed the prevailing environmental balance but also were instrumental in creating unprecedented difficulties to the human race. Effects of environmental pollution on human health, resource depletion, threat to living standards, decrease in biodiversity, loss of forest products and medicinal plants and climate change induced natural disasters can be cited as examples. In the circumstance, a great interest is seen both at national and international levels on the responsibility of the humans for maintaining the environmental balance.

The main objective of this lesson is to develop positive attitudes towards the conservation of the physical and human landscapes to ensure the prevalence of an environmental balance. This chapter also emphasizes the necessity of adhering to environmental ethics and shows the negative consequences of neglecting such ethics. Further it emphasizes, on the ways of achieving development without disturbing the environmental balance.

Ways in which humans use the environment

From the dawn of history the environment had been used to satisfy human needs. However, it is clear that the ways in which environment was utilized has differed over time. It is possible to recognize three stages in this process. They are,

a) Using the environment without modifying it

b) Acting in cooperation with the environment

c) Using the environment by modifying it.

The stages indicated above are shown in Figs. 4.1, 4.2 and 4.3. The ways in which man uses the environment are summarized below:

Fig. 4.1 : Using the environment without modifying it

Fig. 4.2 : Acting in cooperation with the environment

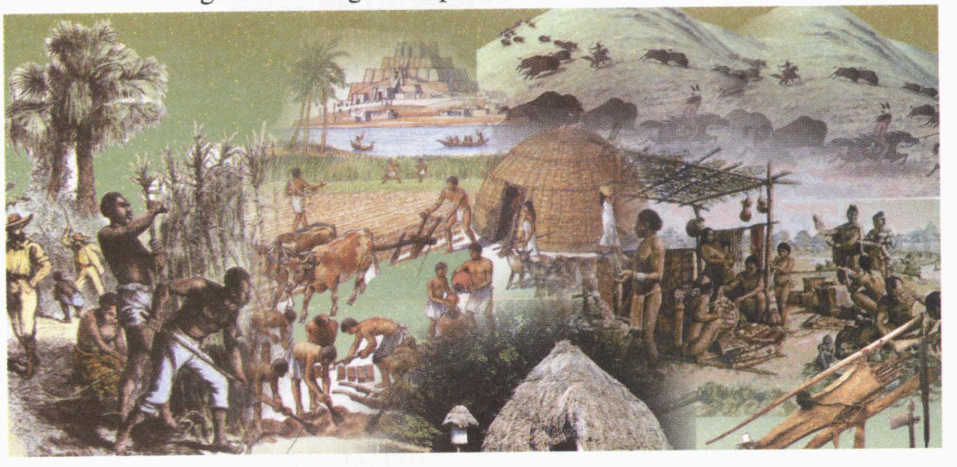
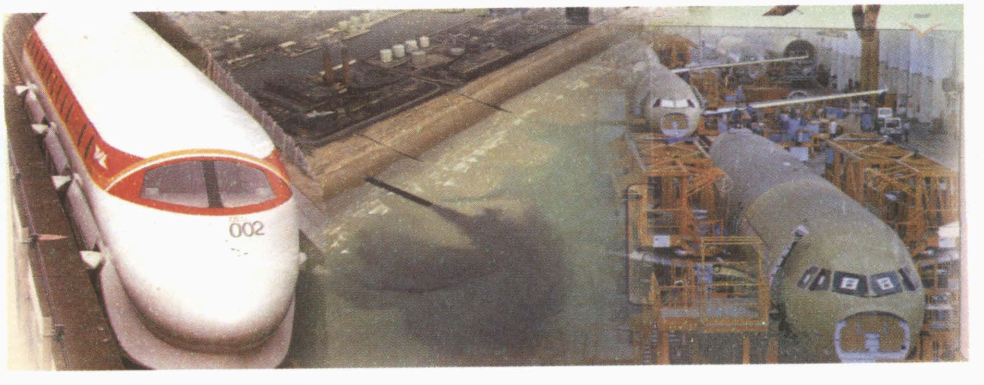


Fig. 4.3 : Using the environment by modifying it



- Obtaining water, air and sun light that are needed for man's existence
- Utilizing environmental resources for food, housing and clothing
- Using natural objects for worship and beliefs
- Establishing irrigation networks required for agriculture
- Mining minerals for use as raw materials in industry
- Provisioning of wood and fossil fuels for energy
- Utilizing rivers for transport
- Making use of natural objects such as soils, plants and ecosystems for research
- Utilizing natural phenomena (mountain ranges, rivers) as political boundaries
- Making use of natural scenic beauty for recreational activities.

The above list makes it clear as to how the environment has been useful for economic, social, political and cultural activities of the people.

Activities

1. Study figs. 4.1, 4.2 and 4.3
2. Give a brief description of man using the environment without modifying it, acting in cooperation with the environment, and using the environment by modifying it.

Ethics

Accepted rules, customs and traditions followed by members of a community or a cultural group can be termed as ethics. On this basis,

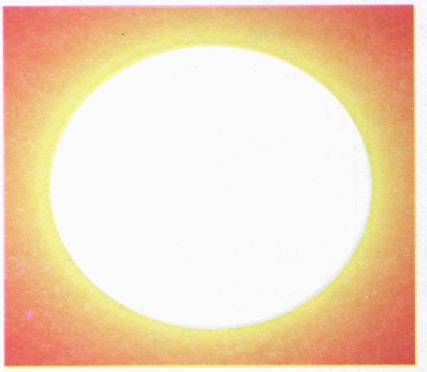
environmental ethics constitute good and meaningful practices required to manage the lithosphere, hydrosphere, atmosphere and biosphere in a suitable fashion.Ethics are related to personal behaviour. Accordingly, ethical behaviour and related beliefs and evaluations of attitudes exhibit a close relationship.

Necessity to Comply with Environmental Ethics

From the period man started interacting with the environment he has made queries about the environment. The ancients had a fair knowledge about the environment. We can understand this by the ways in which man used to satisfy his needs without destroying the environment. The ancients received an understanding and a knowledge relating to the environment as they acted according to religions, faiths and beliefs. Religions taught many things in the context of the environment. Customs such as respecting trees, preserving them and worshiping them, hanging a small branch of a tree expecting protection from the gods of the woods when entering forests are still prevalent among some communities. The main reason for this is the close link between religious life and social life according to prevailing beliefs and faiths. Let us now turn to religions and philosophies that have arisen in different parts of the world to see how they extol the value of the environment.

Fig. 4.4 : Natural phenomena worshiped by the Egyptians

Artain – Sun God



Sen - God of whirl winds

Orisis – God of forests

Hator – Goddes of the sky

Some beliefs of the Aborigines of Australia together with those of the Incas of Peru and Red Indians of North America regarding the environment are given below.

All requirements of the humans are provided by the environment. Therefore, environment is considered as god and objects of nature are worshipped. The Sun and the moon, trees, animals as well as bones of the dead have all been worshipped. It was believed that ancestors have assumed the form of natural objects such as mountains, trees, rock caves, stars, sun, moon etc. and therefore, need to be venerated.

Buddhism

Buddhist religion is deeply ecological. It strongly expresses human identification with nature. Buddhists believe that all things, including humans, exist by their interrelationship with all other parts of nature. Lord Buddha taught that respect for life and the natural world is essential. By practicing loving kindness one can be in harmony with other creatures and learn to appreciate the interconnectedness of all lives.

Buddha in his preaching has cited examples from nature on many occasions. Advice given by the Buddha to a youth named Sigala tells him that a wise person who collects grain like a bee that gathers nectar without hurting the flower is able to amass wealth.

According to Buddhist teachings "A person who breaks even a branch of a tree which sheltered him is an ungrateful individual".

Lord Buddha's appreciation of the natural beauty of Senanigama in the Province of Uruwel also indicates an appreciation of the environment. These examples show that the message of protecting of nature was given to humans by Buddhism. It should also be noted that Prince Siddhartha's birth, attainment of Buddhahood and the passing away of the Buddha took place under shade of a tree. This too indicates the link with the environment.

Hinduism

All traditions of Hinduism such as Vedic and Upanishad which accept the concept of creation have spoken of harmony with nature and with the whole creation.

Hindus believe that "Everything in this world belongs to God. His force extends to both living and inorganic things. Therefore, one should possess only the portion to which one is entitled. The rest should be left to God".

According to Hinduism acts of kindness performed by trees are mentioned as follows:

They provide fuel to the households

They provide shade and dwellings to people

They allow nesting by birds

Their leaves, roots and barks provide medicine.

Fig. 4.5 : Trees protecting the environment

Environmental worship had been a feature in ancient Vedic religions. Aryans who migrated from Central Asia to India and Persia (present Iran) made settlements, created cultures and bestowed divinity on natural objects. One of the basic features of Vedic religions is to worship the Sun and other gods who preside over the earth. They also praise the power of nature.

The real meaning of nature worship in the Vedas is the prosperity of agriculture and the protection of the environment. Vedas refer to animal domesticity and domesticated animals are treated as man's friends. In the Upanishads there is an understanding of the interrelationship of everything in nature.

As stated by Mahathma Ghandi, a renowned Indian philosopher, nature possesses resources to satisfy the needs of all persons but not their greed. We have to always question what is that we really need. This means that if we are to live in harmony with the environment, it is important to utilize its resources within limits. This view finds expression in Mahathma Gandhi's philosophy of 'non-violence'.

Christianity

Christianity which believes in creation also explains the relationship between man and nature. Christians believe that both Man and Earth are God's creations. Everything on earth exists at the discretion of the Almighty. As mentioned in the birth of Jesus Christ in the Holy Bible religious beliefs and faiths that have come down from ancient times and sermons of the religious leaders have paid special attention to the environment.

Man's responsibility to the environment is accepted in Christianity as well. Nevertheless Christianity teaches that man is not the owner of the environment, but only a caretaker on behalf of God.

Sowing and harvesting, cold and warmth, winter and summer, day and night may continue to exist until such time the earth lasts.

Holy Bible

This statement also confirms the importance of conserving the environment.

Islam Religion

Doctrine of Islam believes that Almighty Allah created the whole world including the environmental phenomena and they function according to Almighty Allah's wish. Followers of this religion consider it their duty to respect the Almighty Allah's creations, protect them and utilize them in a productive way.

Lord Abubakkar (Rali) who became the leader of the Muslim community after Lord Muhammad Nabi admonished the soldiers going to war.

Do not cut down trees and do not kill animals (in the enemy territory) except for food.

Lord Hazrat Abu Bakr (632CE)

Trees are not to be burnt, nor unjustifiably pulled out and women, children, the elderly and unoffending priests or monks should not be harmed.
As quoted by - Fazlum Khalid, 1992

Shinto religion

The environmental friendly Shinto religion of Japan strongly believes in the invisible forces of nature. It propagates that every mountain, every river, every tree is intimate to man. Therefore, we also should be dear to them. Shinto adherents believe that declining morals lead to numerous disasters and difficulties.

Environmental Ethics of Red Indians

Sayings of the Red Indian chief, Seattle, confirm the close and inseparable link between man and nature.

"Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the dark woods, every humming insect is holy in the memory and experience of my people".

".....this land is sacred to us. This shining water that moves in the streams and rivers is not just water but the blood of our ancestors. .....The water's murmur is the voice of my father's father".

"The perfumed flowers are our sisters; the deer, the horse, the great eagle, these are our brothers".

"The rivers are our brothers, they quench our thirst".

"What is man without the beasts? If all the beasts were gone, man would die from a great loneliness of the spirit. For whatever happens to the beasts, soon happens to man. *All things are connected".*

Accordingly it is clear that through environmental beliefs, faiths, philosophies and religions man has maintained friendly relations with the environment since ancient times. This is particularly evident when in the evolutionary context man used the environment without modifying it as well as when man acted in harmony with the environment with only slight modification of the environment.

Activities

1. With examples show the relationship between man and environment as explained in your religion.
2. Indicate in this context a few lessons which could be obtained for the present.

Need for following environmental ethics is more in evidence today as man is engaged in an attempt to overuse the environment. due to,

- Rapid increase of population and expansion of human needs
- Excessive use of mineral resources
- Technological advancement
- Expansion of international trade relations.

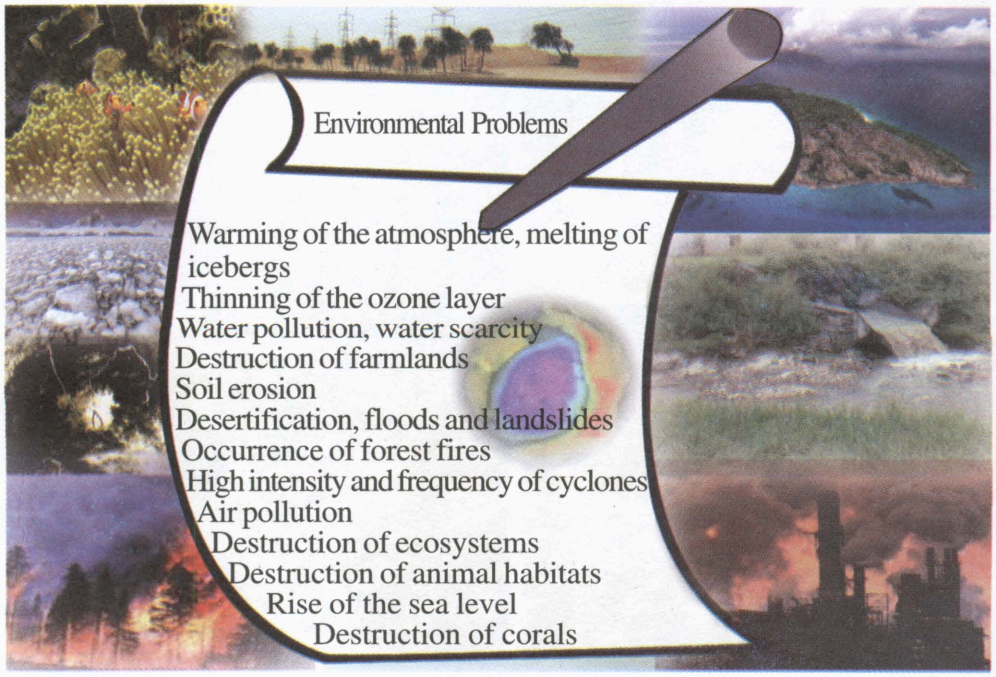
Undesirable waste matter is released to the environment by public and private sector manufacturing industries. Because of such influences natural ecosystems are subject to change. All life forms of the world have to suffer the unfavourable effects of such change.

Development process causes changes in the natural environment through activities such as the construction of factories, establishment of reservoirs and expansion of farmlands. Therefore, people have to face various disasters because of the loss of environmental balance. In order to minimize these effects, people have to make environment a part of their lives. Hence, the need to follow environmental ethics. It is necessary to understand that the environment too is a living object as one's own self and there is a live process active within it. Adhering to environmental ethics becomes most important as it is necessary to leave behind a safe environment for future generations.

Consequences of Destroying the Environmental Balance

At the time when the world population was relatively low people could live in harmony with the environment. Therefore, they were able to live without disturbing the environmental balance. But with the rapid increase of population there arose a great demand for housing and other consumer needs. As a result people tried to extract from the environment much more than it could reasonably provide thereby leading to a disturbance of the environmental balance. Excessive use of environmental resources and waste have caused many complex environmental problems. Some of them are as follows:

Fig. 4.6 : Environmental problems



Activities

1. Write three environmental ethics on the basis of what you have learnt, what you have gathered from books, magazines etc. and what you have heard from the elders.
2. Explain the need to follow environmental ethics.

More than six billion people inhabiting the world today are consuming earth's resources at an ever increasing rate. They satisfy their economic needs through the natural environment. For this reason natural resources are facing rapid depletion. At the same time human activities detrimental to the environment are causing climate change.

Major cause for most of the environmental problems mentioned above is the warming of the earth's atmosphere. Therefore, people from all countries must get together to find collective solutions to these problems as humans directly contribute to the increase of global temperature through activities such as mining of underground resources for energy, use of green house gases, urbanization, improper disposal of waste, use of agro-chemicals and the waging of war.

Activities

Fig. 4.7 : Desertification, Lightening, Cyclones and Landslides

1. Study Fig. 4.7 carefully.
2. Give reasons for these disasters.
3. Explain what can be done to prevent or minimize these disasters.
4. From a student's perspective explain the significance of maintaining the environmental balance.

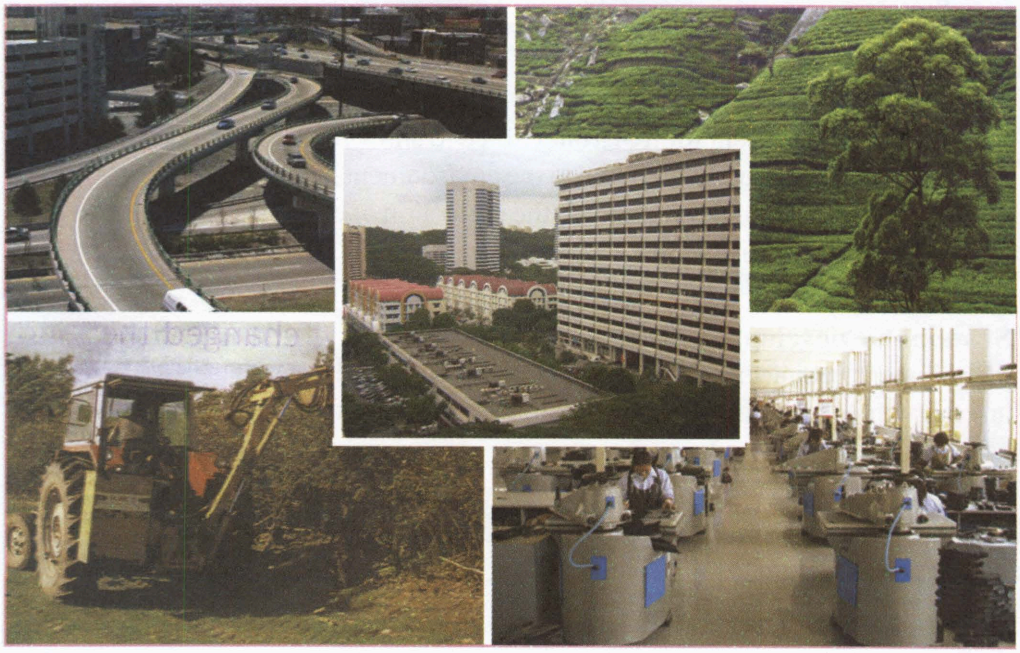
Environmental Balance and Development

The negative influences of accelerated development on the environment are increasing rapidly. This process which commenced with the industrial revolution is the result of many reasons such as

- Rapid utilization of mineral resources
- Improvement of road networks and modes of transport
- Excessive use of agro-chemicals
- Establishment of large irrigation projects
- Spread of large farmlands
- Damming of rivers
- Cultivation of highlands and slopes

Photographs of few development projects are shown in Fig. 4.8

Fig. 4.8 : Development Projects



It is clear that the above activities undertaken in the name development often disturbs environmental stability. Although development is a necessity, for it to be successful, it has to be undertaken with due care for the environment.

Development strategies will not cause problems if they are designed to provide beneficial long-term results without causing environmental damage. If the development process leads to undesirable effects then development cannot be termed successful, because of the environmental problems that it entailed.

Direct or indirect problems caused by human activities are given below :

- Increase of global temperature
- Rise of the sea level
- Drought
- Strong winds
- Soil erosion
- Floods
- Landslides
- Water pollution and
- Air pollution figure predominantly among them.
- Acid rain

Man is not the owner of the environment, but only one of its partners. Hence, it is important that steps be taken by man to make the development process a sustainable one.

Activities

1. Create a presentation of your choice to show how human activities have contributed to a breakdown in the environmental balance.
2. Prepare slogans pertaining to the protection of environmental balance and display them in the school premises.

Sustainable development is,
development leading to the satisfaction of present needs while simultaneously creating an environment ensuring the right of future generations to satisfy their needs.

In other words it is a development which could be sustained. This means initiation of development processes which can be economically, socially and environmentally sustained.

In the past, Sri Lankans performed their agricultural activities in accordance with the environment. They built tanks and irrigation networks suited to particular areas. Therefore, there had been no great damage to the environment. Steps such as selection of suitable lands for *chena* cultivation, clearance of a new plot only after letting the former plot to fallow and allowing for the natural regeneration of the soil before cropping again, helped not to disturb the environmental balance. Preparation of *chena* lands after felling and burning of forest chased away wild animals. The fact that no damage was caused to such animals is shown by this statement.

"No-legged and two-legged animals, birds, reptiles, go away from this forest. We are not committing a sin. Before the god of fire invades you better leave"

Similarly, a part of the cropland was left open to birds. That was termed *kurulu paluwa* (portion left to be damaged by birds). The idea was to attract birds to the field as they behave as predators and prey on insects harmful to the crop while at the same time restricting the damage done by the birds to a minimum. As this is a natural process there was no damage to the environment. Another salutary gesture was leaving the catchment immediately above the water level of the tanks/reservoirs free of cropping to allow space for work animals to browse.

Fig. 4.9 : A tank, an irrigation canal and a group of workers building an irrigation canal

Building of canals and irrigation networks to convey water from the source to the farmlands and planting of *kumbuk* trees along canals were done. This allowed the absorption of salt by the root system of trees thus causing purification of water by natural means. Multiple cropping was conducted in order to reduce the insect damage

to a minimum. Adopting crop rotations to retain fertility of soils, use of margosa oil, citronella oil, resin etc. to control insects, use of organic fertilizer including hay to add fertility to the soil and secret methods *(Kem)* were among the other traditional methods used. These methods did not cause any environmental damage. This type of information clearly indicates the environment friendly ways with which our ancestors ensured the sustainability of the environment.

Activities

1. Name few actions that can be taken to protect the environmental balance.
2. Write some secret methods *(Kem)* followed by the farmers in your area.

As large scale development projects of the present day do not give adequate attention to the environment, there exists a threat to the environment balance. Hence, numerous steps have been taken both at mational and international levels to naintain the environmental balance.

Some common actions that could be followed to maintain the environmental balance are given below :

- Use of strategies to prevent environmental pollution caused by industrial development
- Disposal of waste generated from industries in a regular manner
- Adopting a proper plan in town and village development in order to avoid disasters
- Use of conservation methods specially in the cultivation of slopes
- Flood control, conservation of river banks and conservation of coasts
- Avoiding filling and clearing of wetlands
- Preparing suitable development plans with due consideration to climate, land and soils of the respective regions
- Introduction of irrigation, cropping methods and crops suitable to the environment
- Securing the cooperation of all relevant institutions in planning regional and town development activities
- Contributing to conserve the environmental balance through the use of appropriate technology in development pursuits
- In the management of development activities creating community awareness on disaster management and planning for disaster management.
- Taking care to carry out all development pursuits on a sustainable basis.
- Minimizing the use of chemical fertilizer and other agro- chemicals.
- Encouraging the production and use of compost.

Environmental Conservation Policies at International Level

International Agreements, Decrees, Acts and Conventions have been adopted for the purpose of global environmental conservation to achieve sustainable development in order to ensure the survival of humanity. Factors relating to some of them are given below:

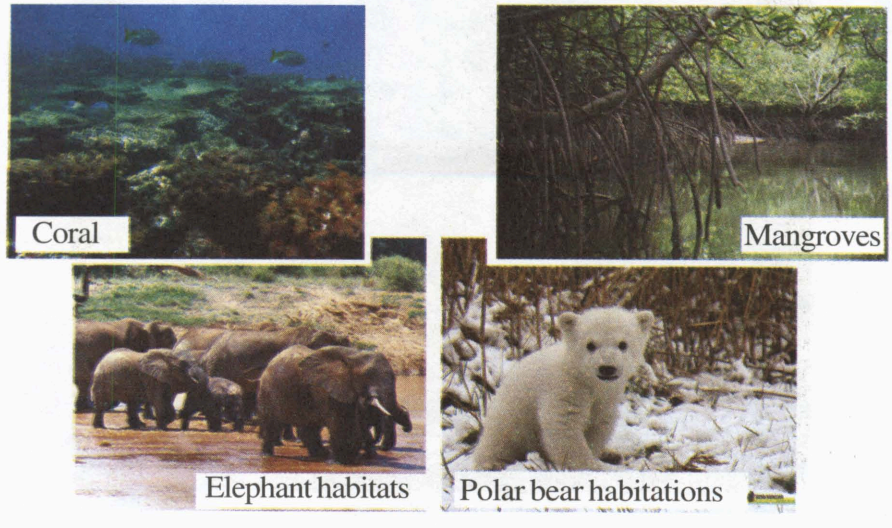
Convention/Organization	- Ramsar Convention
Commencement	- In 1971 in Ramsar city in Iran
Member countries	- 158 (by 2008)
Objectives	- • Wetland conservation • Wetland management • Inclusion of at least one internationally significant wetland

A wetland is a natural or artificial, permanent or temporary, stable or draining, fresh water, salt water or mixed water marshes, completely inundated areas or lands going under water up to 6 m. during tides. Muthurajawela, Bundala and Kalametiya in Sri Lanka are examples of wetlands.

International Wetland Day commemoration is annually conducted under a special theme.

It is our duty to preserve these wetlands which help to protect biodiversity

Fig. 4.10 : Ecosystems Facing Destruction



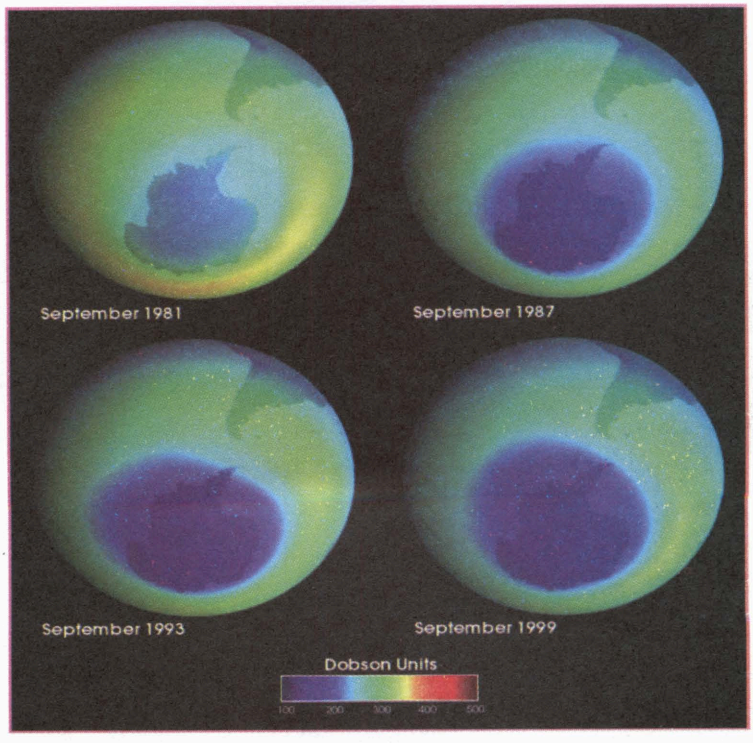
Montreal Convention

Convention/Organization	- Montreal Convention
Commencement	- In 1987 in Montreal, Canada
Member countries	- 194 (by 2008)
Objectives	- • Limiting the production of Chlorofluorocarbon and Helon which destroy the ozone layer. • Complete cessation of the use and production of these gases by year 2000.

Scientists believe that because of action based on these international agreements the ozone layer is being replenished

In order to protect the ozone layer we must be responsible not to burn or release harmful materials even at domestic level

Fig. 4.11 : Depletion of the Ozone Layer



Rio Convention

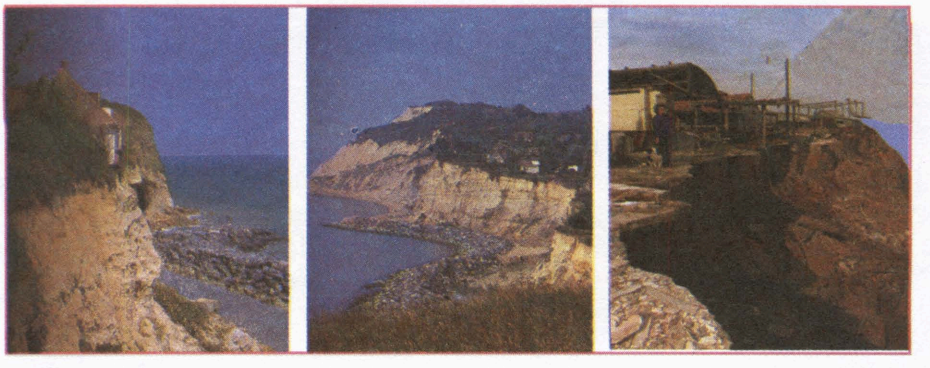
Convention/Organization	- Rio Convention
Commencement	- On 03.07.1992 in Rio de Janeiro, Brazil
Member countries	- 172 (by 1992)
Objectives	- • Prevention of addition of Chlorofluorocarbon and Helon to the atmosphere • Protection of biodiversity • Abstaining from biodiversity destroying acts.

It is our duty to organize our activities according to the Rio Convention

Sri Lanka is also a member of these conventions which were convened at international level to protect the environment. In Sri Lanka even lands with natural features of universal value are threatened by human activities causing numerous environmental problems. Therefore, specific environmental regulations and acts have been passed in Sri Lanka paying attention to these problems. Some of them are,

- Coast Conservation Act
- National Heritage Forestland Act
- Marine Pollution Prevention Act
- Forest Conservation Act

Fig. 4.12 : Eroded Coastal Areas



Coast Convention Act

Regulation/Act - Coast Convention Act

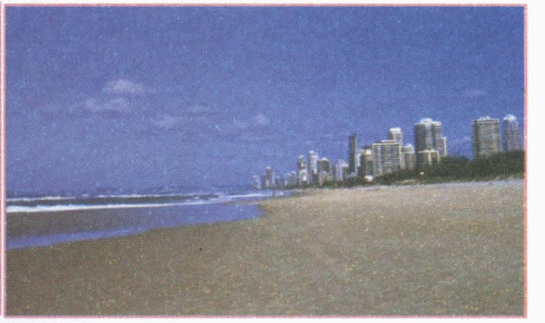
Commencement - 1981

Objectives -
- Surveying the coastal zone
- Exploring the resources of the coastal zone
- Management of the coastal zone.
- Regularization and control of development activities within the coastal zone
- Conservation of the coastal zone

Observance of the regulations of the Coast Convention Act allows to minimize the damage to the coastal zone and to conserve it.

Fig. 4.13 : A Coastal Area

Fig. 4.14 : An Urban Settlement Near the Coast



National Heritage Forestland Act

Regulation/Act - National Heritage Forestland Act

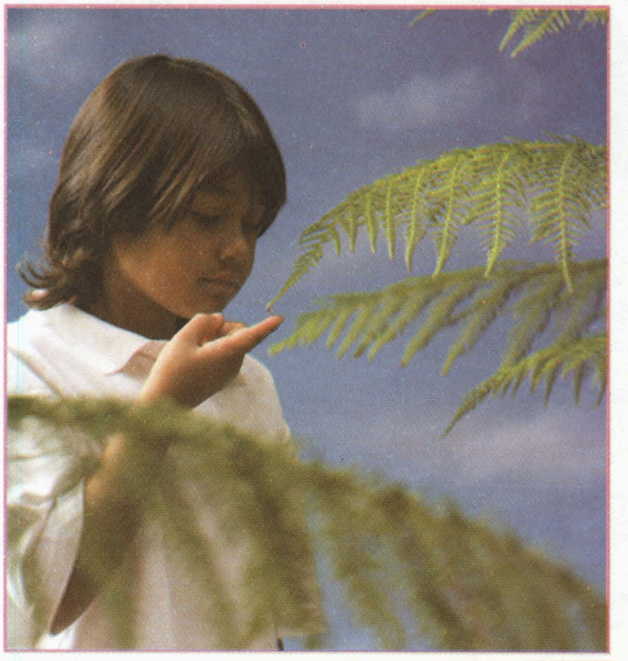
Commencement - 1988

Objectives -
- Declaration of National Heritage Forestlands
- Protection and development of National Heritage Forestlands.

National Heritage Forestlands

- Ecosystems with exceptional natural characteristics
- Locations with gene resources or biological values
- Plant and animal habitats facing threats of extinction

Fig. 4.15 : A girl appreciating the beauty of nature



This Act has prohibited many activities such as cutting of plants and trees, sawing, removal, collection and sale of forest matter and shooting an animal or a bird within the proscribed area in order to protect National Heritage Forestlands.

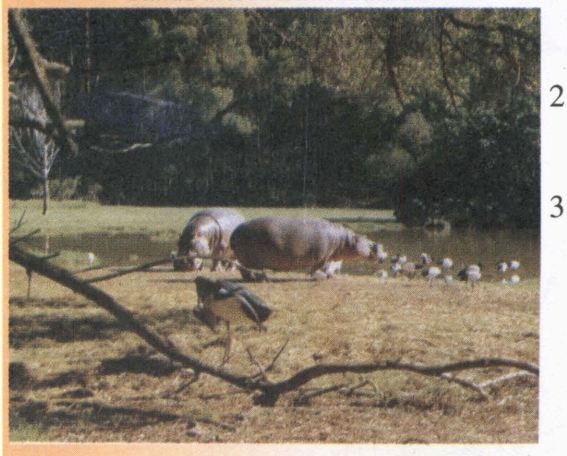
It is our duty to protect National Heritage Forestlands by respecting these laws and regulations.

Activities

An Area Degraded by Mining

Rehabilitation of land

Conversion of land to near original status after Rehabilitation



1. Name five international conventions relating to environmental protection.
2. Suggest three measures that could be adopted for wetland conservation in Sri Lanka.
3. i. Study the photographs well.
   ii. Write down the facts about the lands in Sri lanka that have faced such situations.
   iii. Discuss with your teacher and find reasons for degradation of land.Present your suggestions on how one such land can be rehabilitated.

Sources

Educational Publications Department, 1998, Human Geography Part I. (Sinhala)

Fazlum Khalid with Joanne O' Brien,(ed.), 1992, Islam and Ecology, Worldwide Fund for Nature.

Ministry of Forest Resources and Environment,1999, An Action Plan for Implementation for Biodiversity Conservation in Sri Lanka.

Ministry of Environment, 2006, Wetlands, Central Environmental Authority, 2nd Edition.

Ministry of Environment and Natural Resources, (n.d.), Global Warming: A Warning to All.

National Institute of Education, 1993, Conservation of Coastal Resources, Teachers' Guide. (Sinhala).

Sri Lanka Environment Journalists' Association, 2008, Environment and Media, Vol. 1, July 2008.

Sri Lanka Forest Conservation Department, 2008, Notes Used as Lecture Aids for Forest Projects.

Sri Lanka Democratic Socialist Republic, 1988, National Heritage Wilderness Areas Act No. 3 of 1988.

5. Spatial Features Seen on a Map

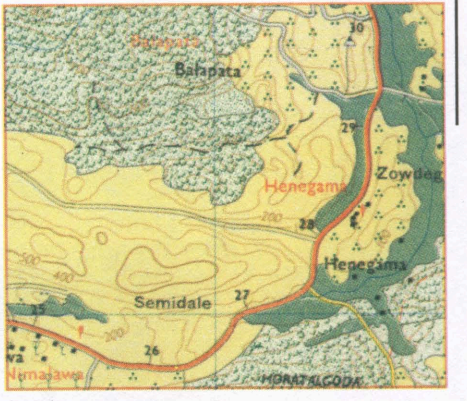
Any feature on the earth's surface would appear to us in three diamensional form. On a flat surface which is used to draw the map these features are depicted in a two diamensional form with the help of colours, symbols and letters. In this way various information on the surface of the land can be represented on maps.

People use different types of maps for different purposes. You have studied topographical maps as well as thematic maps in studying geography during the previous years. The purpose of this chapter is to give you an idea about the spatial features revealed by maps.

Now let us understand the difference between what we see on land and what we see in a map.

A Fig 5.1: The three diamensional appearance of landforms

B Map 5.1: The two diamensional aspect of landforms



Teacher - Malithi, tell us about the features you see in photo -A

Malithi - I can see buildings, hills, coconut trees, roads and a water fall.

Teacher - In grade 8 you learnt the basic information shown in maps. Sathira tell us about the information you see in Map - B

Sathira - There are paddy feilds, gardens, coconut estates and contour lines.

Teacher - Himath can you tell us the difference between the photo and the map?

Himath - Teacher, in the photo I can see the height of the hills; but in the map they are shown by contour lines. The height is written on the contour lines, but I do not see the height of the hills.

Sisitha - What about the buildings? In the photo we see their height, similar to trees.

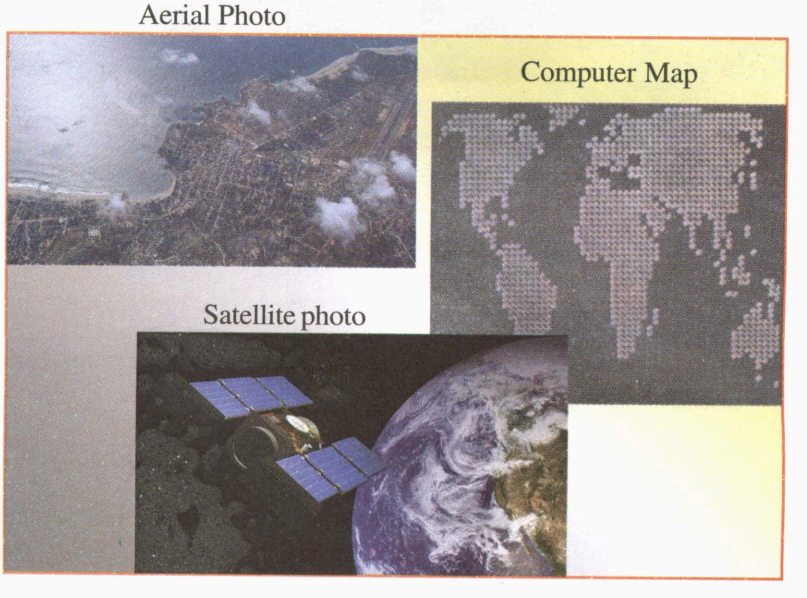
Teacher - In grade 8 we learnt that natural features over land areas as well as features due to human activities are included in topographic maps. Therefore the most important feature regarding a map is that it is a projection of the three dimensional physical and cultural features on to a flat sheet of paper.

The basic features of a map

- Scale
- Direction
- Key

In grade 8 you identified the natural features over land areas as physical features and features due to human activities as cultural features. Physical and cultural features are drawn on maps based on a particular scale using a flat surface. Today maps are constructed using modern technology.

Fig 5.2 : Examples of maps



Photos taken by aeroplanes using special cameras are used to develop aerial photographs. Detailed maps including physical and cultural features can be constructed during a short period with the help of these photos.

Computer maps are based on a computerized grid pattern. In a computer map many details can be included.

Maps can be based on satellite pictures. The special feature of these photographs is that various features over land can be photographed in different colours (Fig 5.2). As true colours are not shown in satellite photography special software should be used to make true colour conversions.

There are different definitions about Maps.

- A Map is compiled according to a scale giving vital information regarding the vast spatial patterns that exist over the earth's surface.

  G.E. James

- A map is a conventional picture of patterns of earth as seen from space".

  Ervin Raize

Now let us remind ourselves of the various features of the physical and the human landscape that we studied in Grade 8.

Features of the Physical landscape	Features of the Human landscape
Ridge	Province Boundary
Valley	District Boundary
Spur	Divisional Boundary
Conical hill	Grama Niladhari Division Boundary
Isolated hill	Trignometrical Station
Steep slope	Paddy, Tea, Rubber, Coconut, Gardenlands
Gentle slope	Other crops

Other than these, various other features that we see three dimensionally on land, are represented in maps using conventional symbols, colours and letters.

Interpretation of maps need an understanding with regard to scale, direction, conventional symbols, colours and letters used in them.

Then you will get the ability to understand the interrelationship between physical and cultural features that are depicted in maps.

Activity

Compile a hand book consisting of various types of maps.

How would you calculate the area of a region, and the distance from place to place?

Scale

Maps are constructed based on a definite scale. Scale is the ratio of the distance between two places on the map and the comparable distance between the two particular places on the ground. In every map scale should be given as it is important to know the scale on which the map is constructed.

Activity

From your school library get a 1: 50,000 Topographical map. Discuss with the teacher how the scale is shown on this map.

There are various methods of showing the scale on a map.

1. Verbal scale 2. Representative Fraction 3. Linear Scale

Verbal scale states what distance on a map is equal to what distance on ground.

(Verbal scale is not shown on 1:50,000 topographical sheets).

A fractional scale is the ratio of map distance to the equivalent distance on the ground using the same units for both.

e.g. : 1/50 000 1:50000

This shows that one unit on the map is equal to 50 000 units on the ground.

A linear scale is a harizontal line which in divided into equal parts to show the relationship of the map to the ground it represents.

In the 1: 50 000 Topographical maps linear scale is indicated by two horizontal lines - one showing the scale in kilometres and the other in miles.

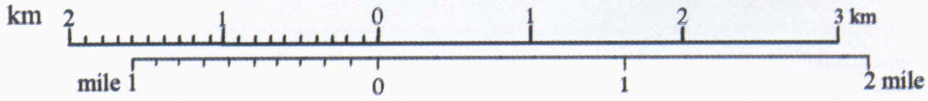


Fig 5.3

- The linear scale in miles is given for easy reference if there is a need to calculate the distance in miles.
- For study purposes it is sufficient to use the linear scale where kilometre divisions are shown. Two centimetre sections to the left of the 0 point should be divided into 1/10 (100 m) divisions.

Fig 5.4

Activities

1. Draw a horizontal line 10 centimetres in length and divide it into two centimetre sections.
2. Mark zero point at 2 centimetres from the left.
3. Towards the right of the "0" mark the divisions as 1,2,3,4. Towards the left the division mark should be marked 1 and the mark at extreme left as 2.
4. On the two corners write "km". Two centimetres on the map show 1 km on the ground.
5. The 2 cm divisions from the left should be divided into 2 mm sections. This represents 1/10 of a km or 100 m.

   2mm = 100m

The most important way of showing scale is by a Representative Fraction. 1:50,000 means one unit on the Map represents 50,000 such units on the ground. Therefore any unit of measurement can be adapted to this method.

This is an internationally recognised method of showing the scale on a map.

With the help of the scale we can calculate the correct distance between two places on the map.

1:50 000

1 cm : 50 000 cm

1 cm : 1/2 km

2 cm : 1 km

On a map drawn to the scale of 1:50,000, if the distance between two points is 2 cm the actual distance between the two places is 1 km.

Activities

1. In a map drawn to the scale of 1:50,000 the distance between A and B is 10cm.

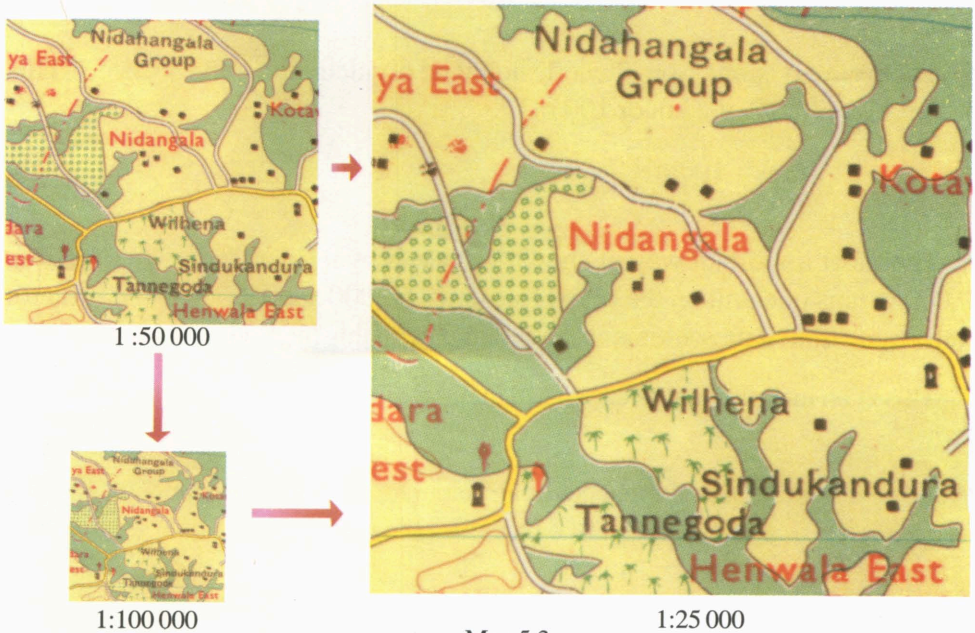
   What is the actual distance between these points?

2. What is the length in centimetres of a road 4km long when constructing a map on this scale?

When you want to find the distance between two places, first measure the distance between these two points in centimetres.

Then on the 1:50,000 scale calculate the number of kilometres.

Map 5.2 : Maps based on different scales



Map 5.3

Study map - 5.2 . These maps of the same area are drawn to different scales. Find out how the information appears when the scales of map differ.

- When the scale is large the map is very clear.
- On a smaller scale the interpretation of various features on the map is difficult.

Activities

1. Ask for instructions from the teacher to draw linear scales for these maps.
2. On the 1: 25,000 scale how many centimetres would represent a distance of 1 km.

Pay attention to these factors

- When it is necessary to measure the distance along rivers and canals use a thread. Similarly use a thread to measure the distance over roads with bends.
- Another way to find the distance along roads is to read the km symbols marked on either side of the road.

Map 5.3 : A section of a metric map

1:50 000

Activities

1. Select a part from a 1:50,000 Map. Measure the length of rivers and canals.

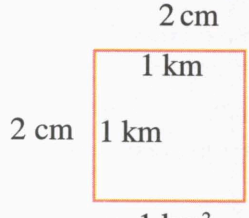
   Write the length of these features in kilometres.

2. Measure the length and width of the Map 5.3 and draw a rectangle measuring (8 cm × 6 cm)

3. Using this rectangle draw a grid to show 2 cm × 2 cm squares

4. The area of a (2 cm × 2 cm) square is 4 cm^2. The area represented by the 4 cm^2 square is 1 km^2

5. By counting the number of (2cm × 2cm) squares you would know the area of a region in square kilometres.



2 cm x 2 cm = 4 cm^2

1 km x 1 km = 1 km^2

2 cm = 1 km

4 cm^2 = 1 km^2

By measuring the length and width of the map it is possible to calculate the area of the region on the map.

- It is possible to calculate the area of a region by measuring the length and width of the map. This measurement should be converted to kilometres based on the 1:50,000 scale (length × width)
- It is possible to calculate the area of a region in square kilometres by calculating the area of the map (length × width) and dividing this number by 4. Another method is multiplying the length and width of the region in kilometres. This number should be multiplied by 4 to find the area of the region in square centimetres.

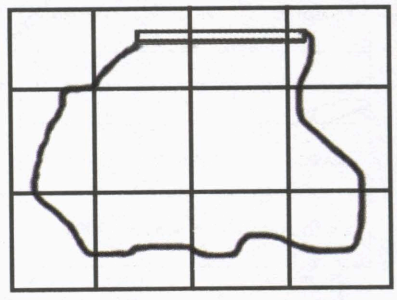
example :- 8 cm × 6 cm = $\frac{48\ cm^2}{4}$ = 12 km^2

(Length) 8 cm = 4 km
(Width) 6 cm = 3 km
4 km × 3 km = 12 km^2 × 4 = 48cm^2

To calculate the area of a tank or sea, draw a grid of one square kilometre over the area showing the water surface on the map. Count the number of squares to calculate the area of the water surface.

Activities

1. Using appropriate symbols and colours draw the following features based on instructions from your teacher.



   Gardenland 1/2 km^2

   Paddy cultivation 1 km^2

   Coconut cultivation 2 km^2

   Tea cultivation 4 km^2

2. Find the area of these blocks of land in square centimetres (cm^2)
3. Find the area of given figure in square centimetres and square kilometres.
4. Shade the tank bund in brown and the water level in light blue

If a map of Sri lanka is constructed according to the 1:50,000 scale what can be the length and width of this map?

From North to South it is 432 km

From West to East it is 224 km

The map of Sri lanka is constructed on the 1:50,000 scale is divided into 92 parts. Therefore there are 92,1:50,000 Topographical Maps. One Map covers an area of 1000km^2 on land.

Study the map 5.4. Each map division is given a name and a number. Find the name and number of the map where your school/village/town is located. Find the names and numbers of the maps relevant to your Province and District.

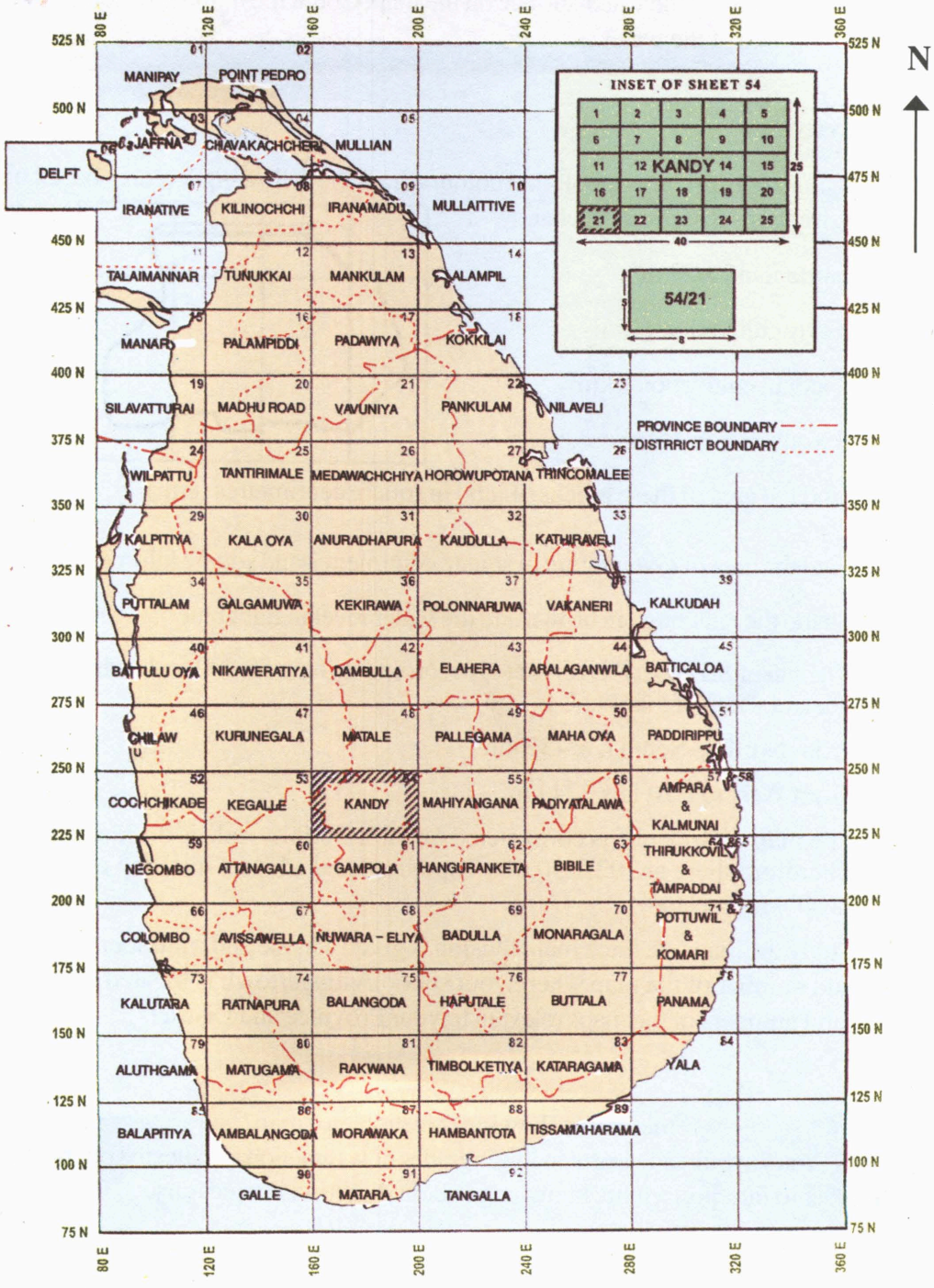
What is the method of showing direction on a map?

You have already learnt in lower grades how direction is indicated on maps. In order to interpret a map, knowledge about direction is necessary.

N

Generally, on a map, an arrow head is drawn in the North eastern corner to indicate the Northern direction. When you know the Nothern direction you are able to know the other directions.

Map 5.4: Sri Lanka Metric Map



(Survey Department of Sri Lanka)

Activity

Copy the diagram and name the other directions.

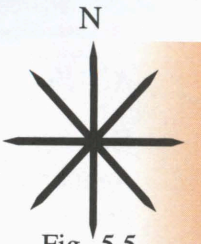


Fig. 5.5

In 1:50,000 Topographical maps in the lower margin there is a special diagram with three vertical lines.

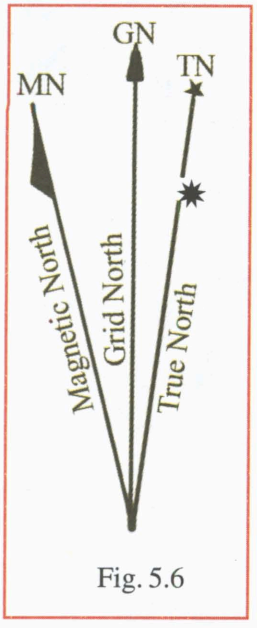


Fig. 5.6

True North - T.N(Geographical North) - True North is shown by a vertical line with a star at the top.

Magnetic North - is the North indicated by the compass. This is shown by a vertical line with half an arrow head at the top.

Grid North - An arrow shows the North in relation to the grid of the area shown in the map.

There is a small angular variation between the lines showing the Grid North and the True North. The line showing True North is drawn either to the left or to the right of the Grid North line.

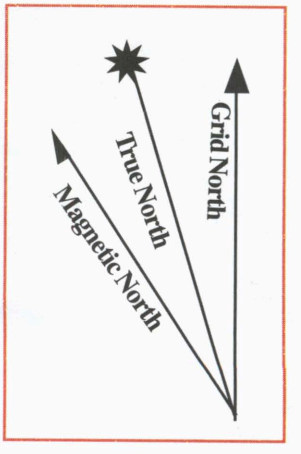


Fig. 5.7

Correct interpretation of a map depends on orienting the map according to the correct direction.

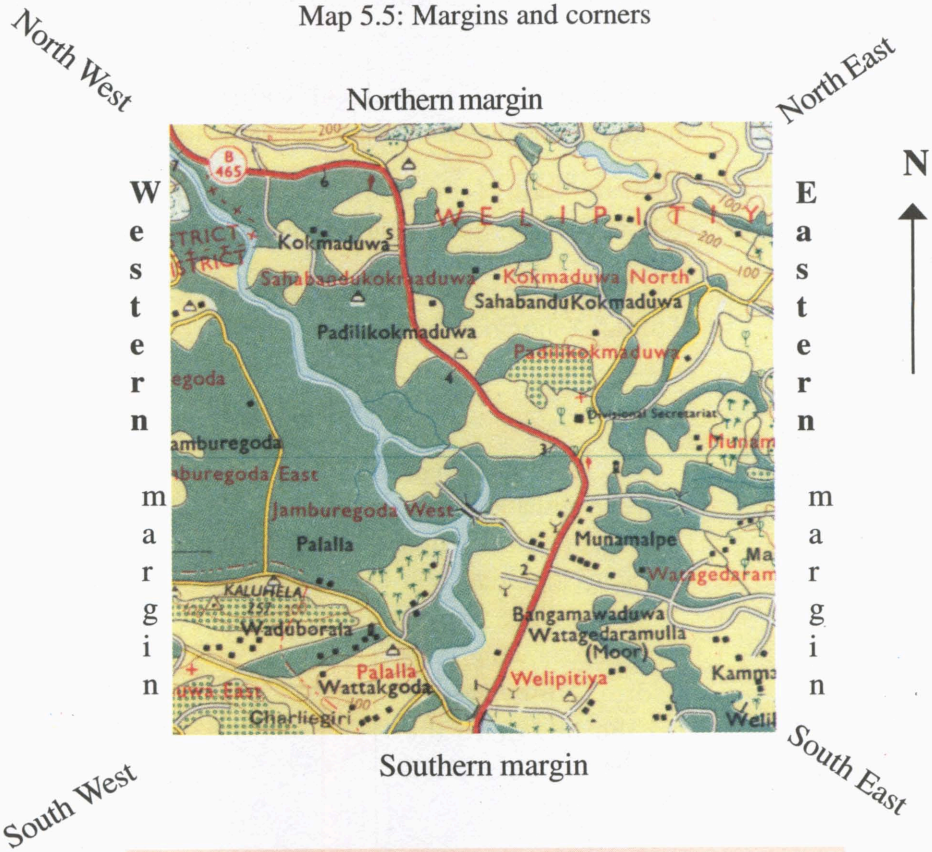
In the 1:50,000 maps the Grid North is shown in the North eastern end.

After orienting the map it is easy to know the correct location of a place with reference to direction.

Activity

Draw diagrams to show the deviation of the True North to the left and right of the North grid line.Name three maps to illustrate each of the deviations.

Map 5.5: Margins and corners

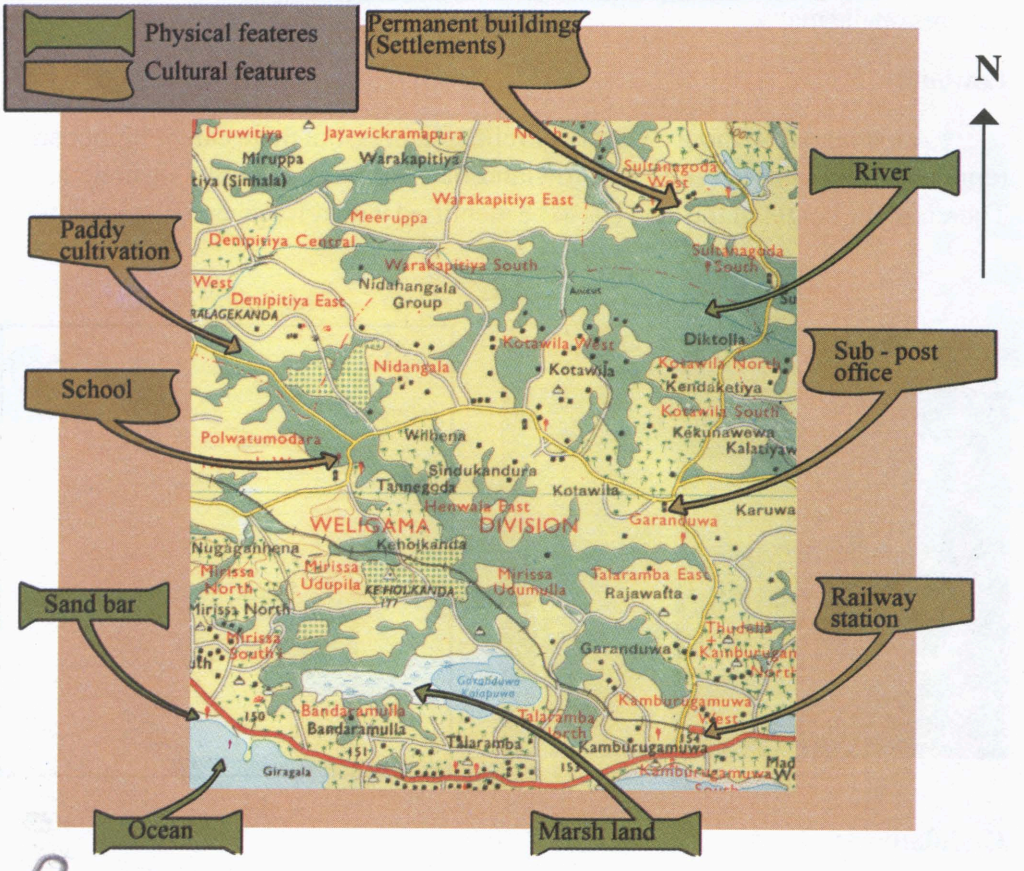


In this map - identify the margins and the corners

The geographical features found on the ground can be identified on a map by looking at the colours, conventional symbols and letters. In grade 8 you learnt about the use of contour lines to indicate variations of relief on the ground.

By studying the distribution and arrangement of contours you will understand the different relief features. You have identified all the built up features in the physical environment due to human activities as the human landscape (cultural environment).

Fig. 5.8 Identifying the Topographical features in a Map



Activities

1. Study the map.
2. Compile a Table showing the features of the Physical and Human landscape shown on the map.
3. Write five sentences about the region shown on the map.

Physical features

The physical features of a region are given different names.

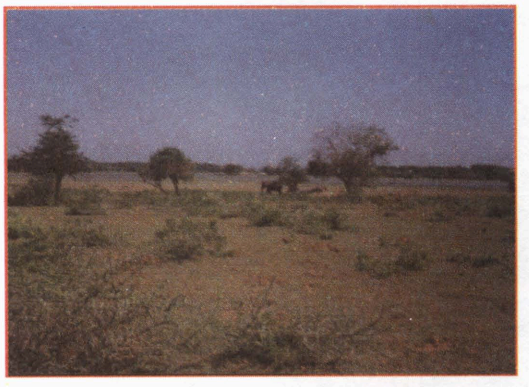
Highlands	Convex slope
Lowlands	Concave slope
Undulating land	Longitudinal valleys
Escarpment	Transverse valleys
Plain - Plateau	Gap

Study the contour arrangements which are drawn to represent various relief features on the maps.

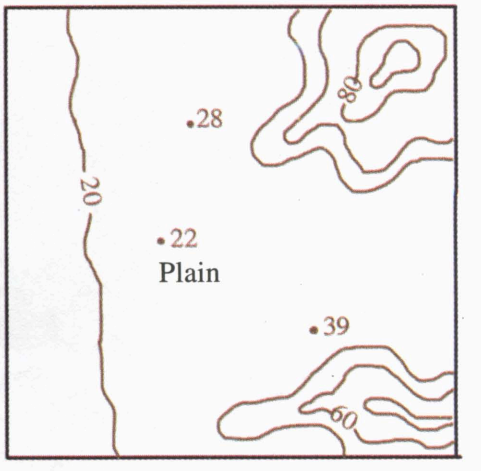
Lowland

A lowland is without a variety of relief features, but there can be higher areas represented by spot heights. In a lowland there are few contours or none at all. Therefore the height of the land has to be identified with reference to spot heights.

Fig. 5.9 : Plain



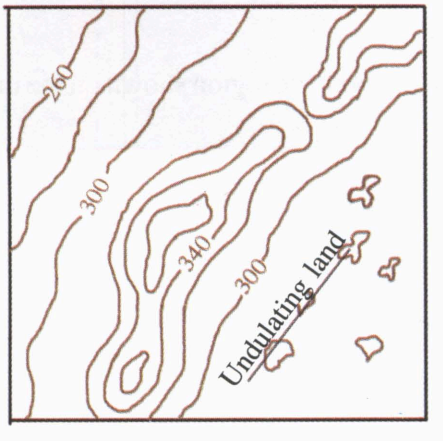
Map 5.6 : Plain



Undulating land

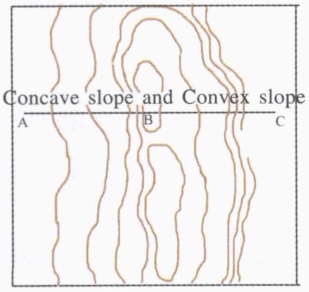
It is not a lowland as there are small undulations spread over the area. But there are no specific physical features. The contour lines are drawn far apart.

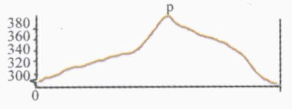
Map 5.7 : Undulating land



Concave slope and Convex slope

Map 5.8 : Concave slope and Convex slope





You must have seen high lands with a steep slope towards the summit and a gentler slope towards the lower area. When the upper contours are drawn close together and the lower contours are far apart such a slope is called a concave slope.

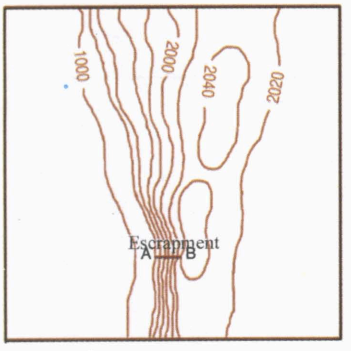
To show a convex slope the upper contours are drawn far apart and the lower contours are drawn close together.

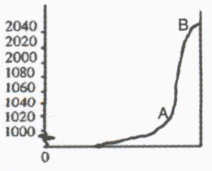
With the help of the cross section study the nature of these slopes.

Escarpment

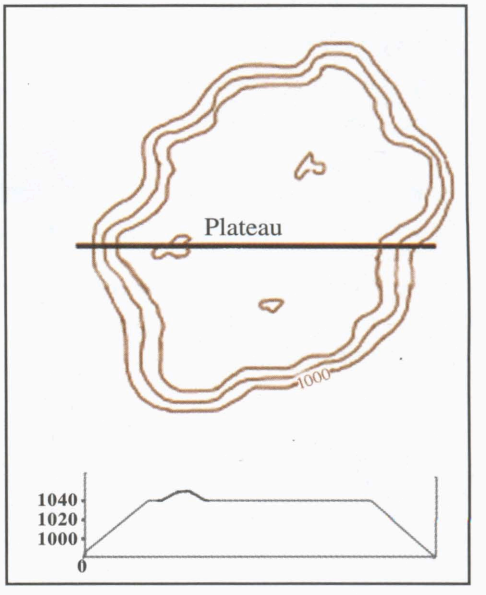
An escarpment is a steep slope that lies between two surfaces of different heights. The contours are drawn so close together that at times they overlap. In Sri Lanka escarpments are located between two peneplains. The cross section shows the nature of an escarpment.

Map 5.9 : An Escarpment





Map 5.10 : Plateau - map and the cross - section



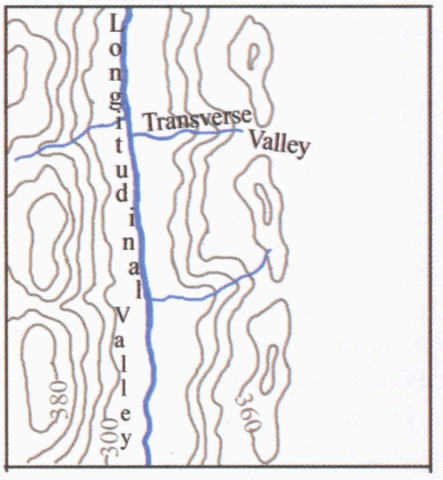
Activity

Draw a ridge with convex and concave slopes. Study carefully the arrangement of contours.

Construct a model of this ridge.

A plateau is a flat area of high elevation. It is separated from the lower area by steep slopes. A plateau can be easily identified as there are few contour lines on its surface while the contours that separate it from the lower region are drawn close together.

Map 5.11 : Longitudinal Valley and Transverse Valley



A valley that is located parallel to the alignment of the ridges or mountain range is called a longitudinal valley.

A transverse valley is a feature that cuts aross the alignment of the ridges.

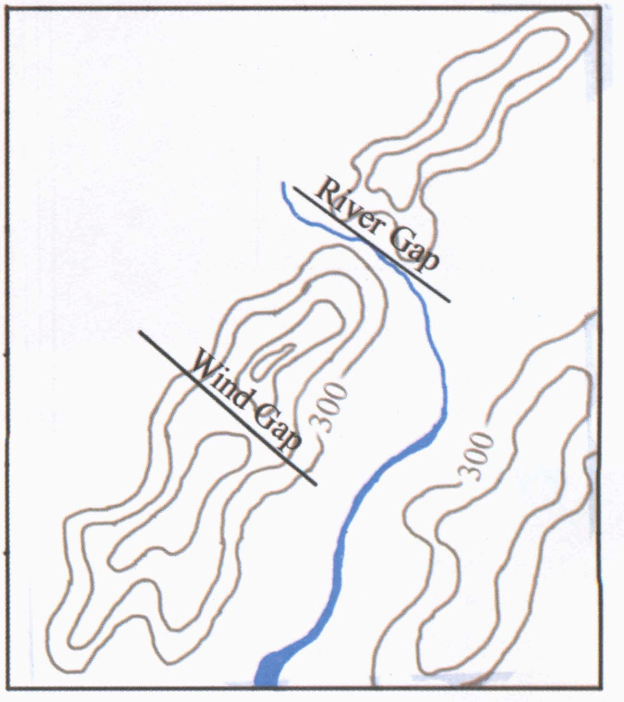
A trellis drainage pattern is created due to the flow of rivers along longitudinal valleys and transverse valleys.
Study Map 5.11 to identify these features.

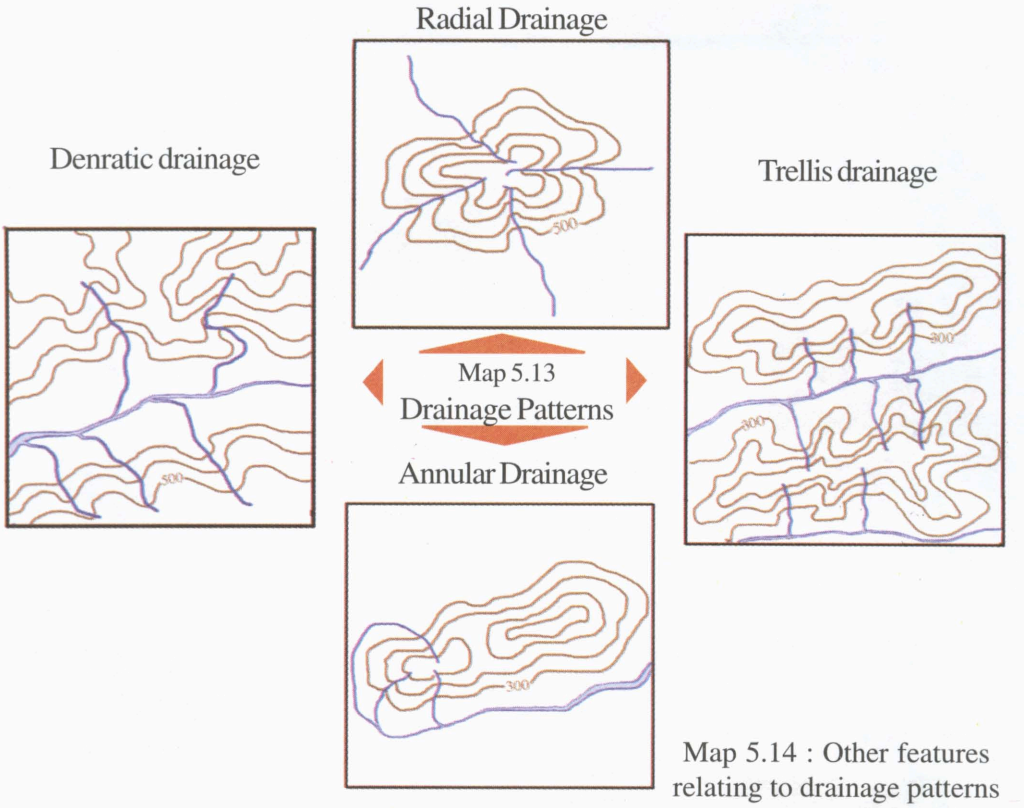
Gap

A lowland area between two highlands is called a gap. If a stream flows along this gap it is called a river gap. A gap without a river is a wind gap. These features can be identified on Map 5.12

In the interpretation of 1:50 000 maps it is possible to identify various drainage patterns.

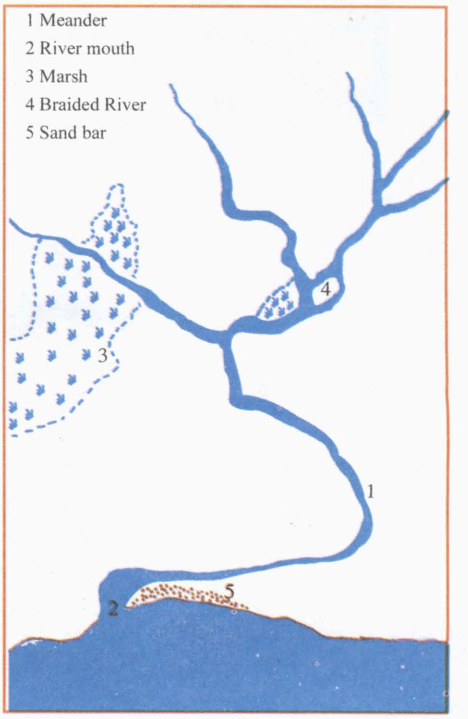
Map 5.12 : River Gap/ Wind Gap





Map 5.13
Drainage Patterns

Map 5.14 : Other features relating to drainage patterns

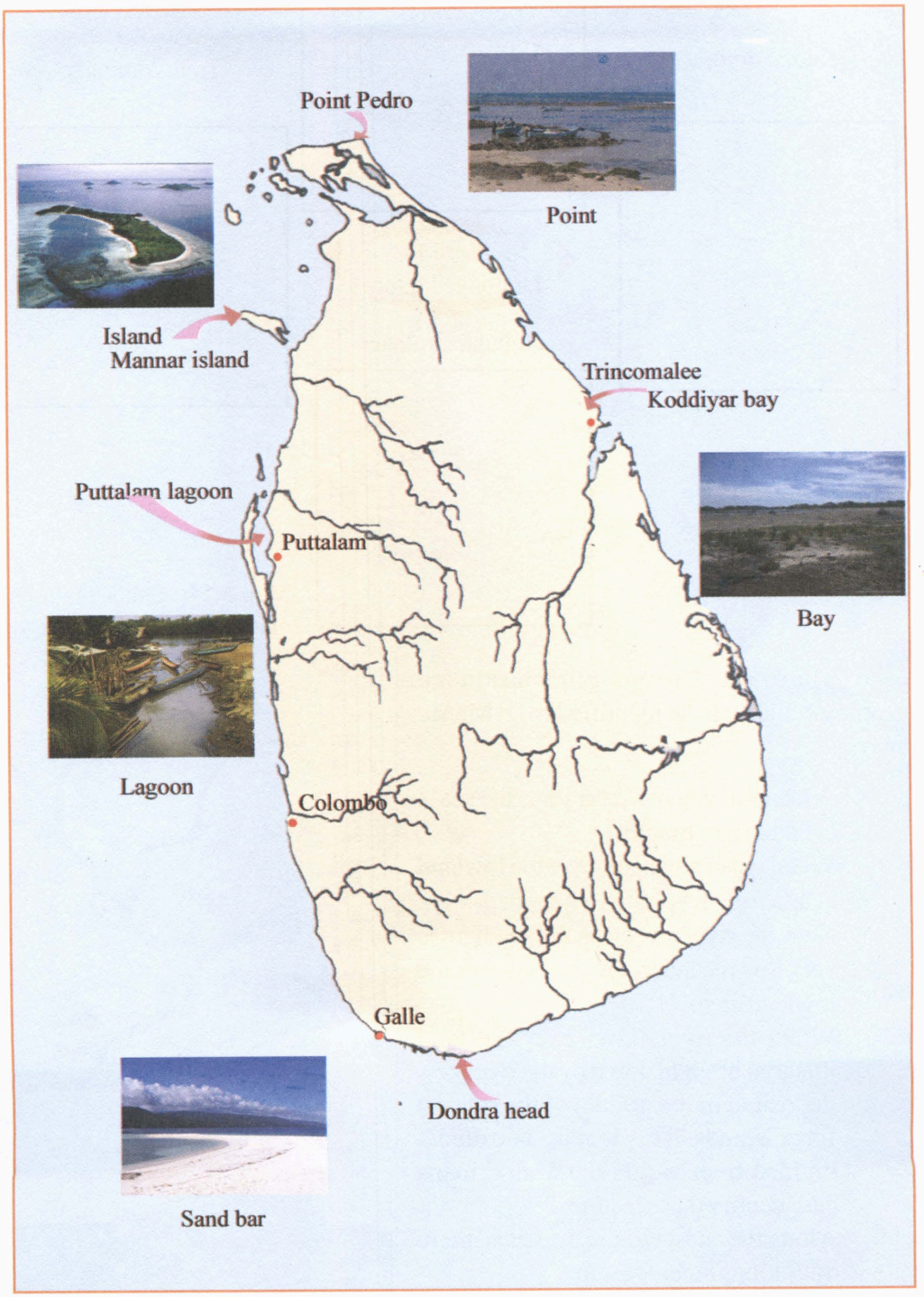


There are various other drainage features which can be identified from Metric maps.

- A location where a river joins the sea is called a river mouth.
- When water stagnates over the lowland near a river it is called a marsh.
- Near the river mouth as the gradient is very low meanders are formed over the lowland area.
- When the river flows over flat land material brought down by the river gets deposited in the middle of the river to form islands. This feature is called a braided river. Study the Metric maps and identify these features.

Along the coast around the island there are various topographic features.

Map 5.15 : Coastal features



Islands, bays, lagoons and headlands are features that you have learnt in Grade 7. In addition to these, sand bars and cliffs too are coastal features. Sand Bars are the result of deposition of material along the coast, brought by rivers and waves.

There are steep slopes formed by resistant rocks along the coast. They are called cliffs. e.g. Galle, Rumassala, Trincomalee.

The key is vital in order to interpret maps. The physical and cultural features included in a map can be identified easily with the help of the key.

In the 1:50 000 Topographical maps the key is organized under eight headings.(See Fig. 5.10)

Activities

1. Study the conventional symbols well and name the eight main topics given in the key.
2. Draw the symbols to show the following features – School, Hospital, Police Station, Courts, Tourist Hotel, Tourist bungalow, Post office, Sub Post Office
3. After studying a Metric Map, tabulate the physical and cultural features shown in different colours.

In 1:50 000 Metric Maps Blue, Yellow, Dark yellow, Green, Red, Black and Brown are the colours used to draw the symbols.
Identify the symbols used to show the cultural features in Metric Maps.

Activity

Study the symbols used in Metric Maps. Prepare a folder using relevant symbols and pictures to be exhibited in the class room.

Fig 5.10 : Legend

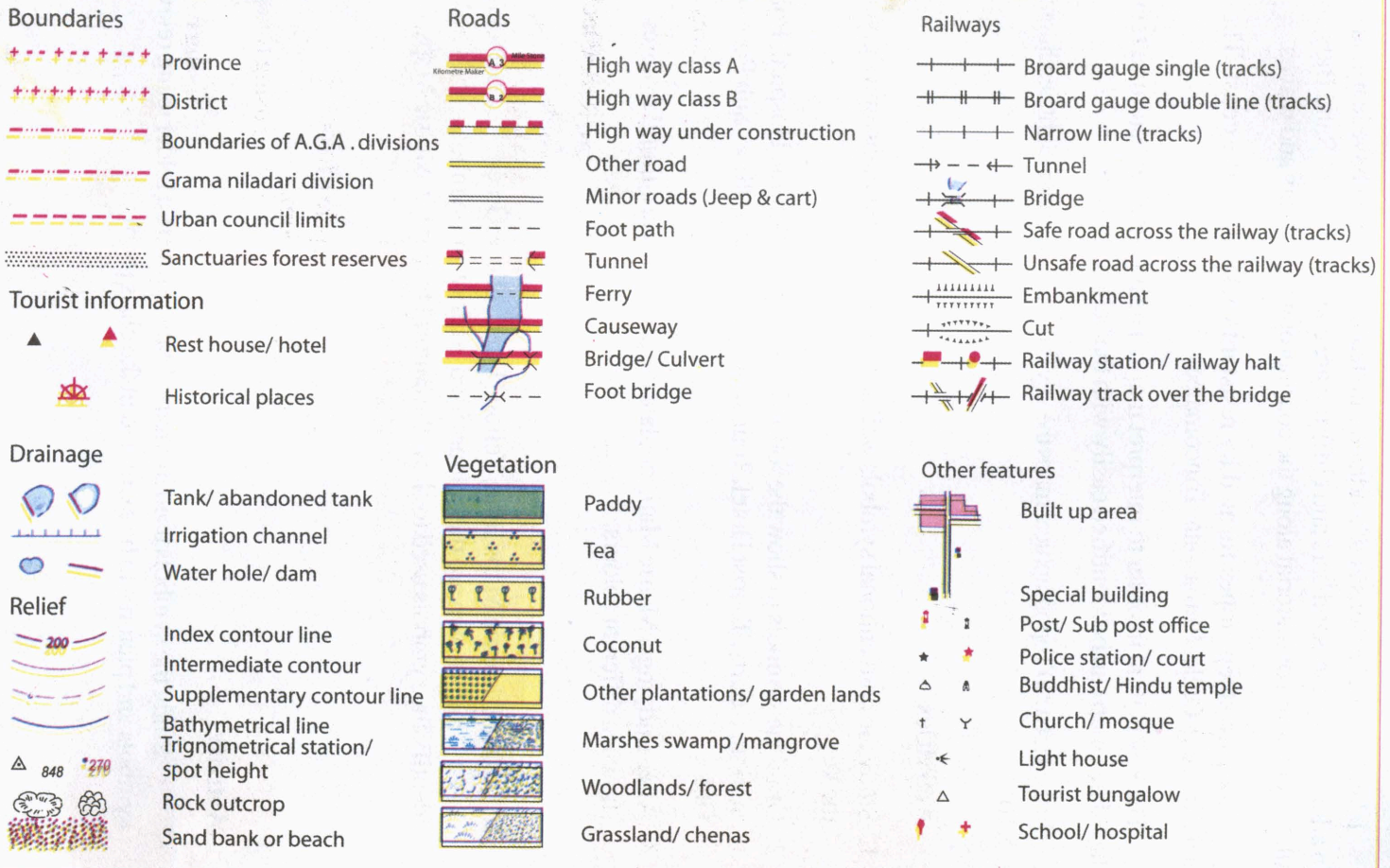
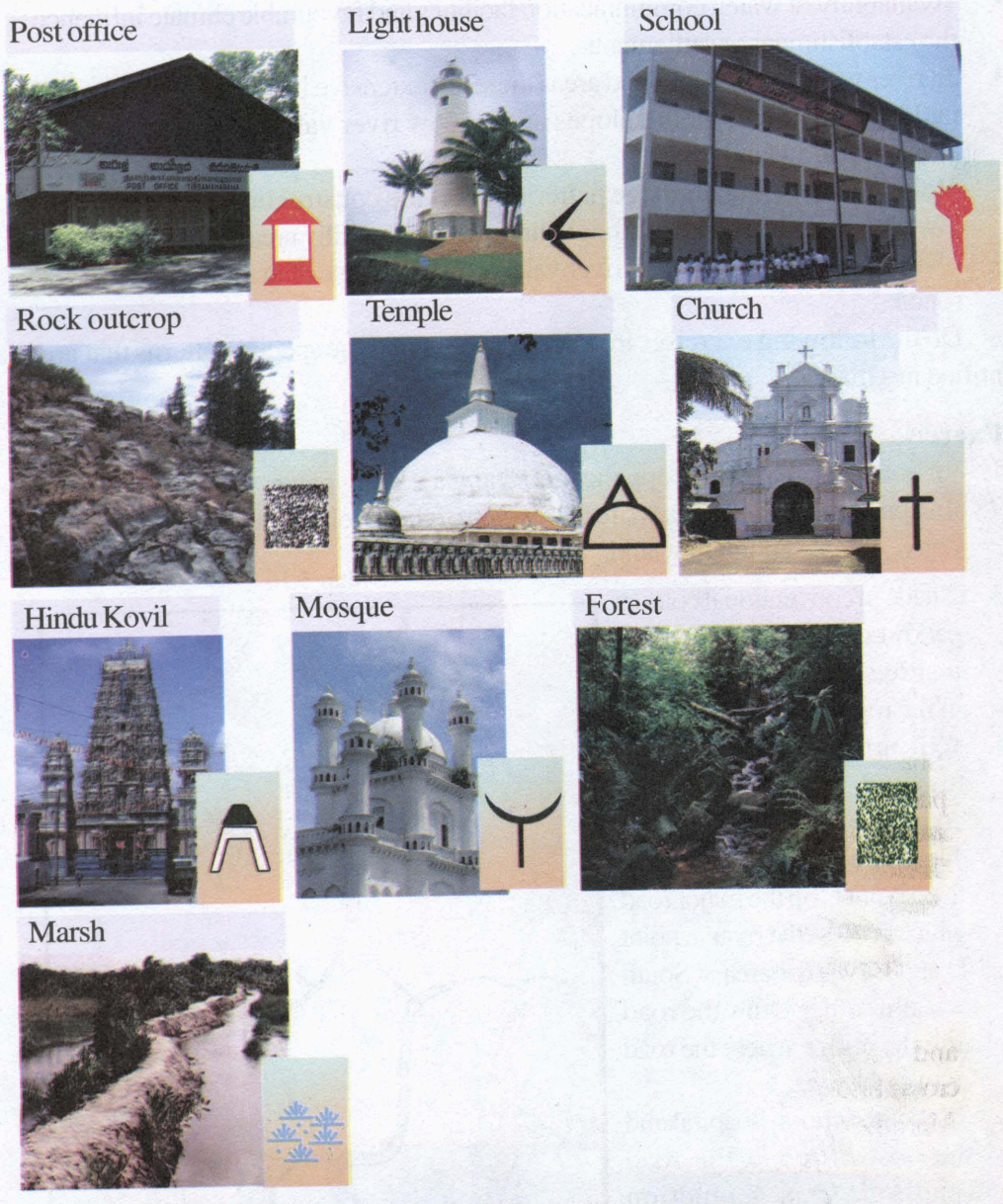


Fig 5.11 : Conventional signs and relevant photographs



The Symbols adopted in 1:50 000 Maps to show the physical and cultural features can be considered as conventional symbols.

Interpretation of maps will make it clear to you that there is an interrelationship between the physical and cultural features.

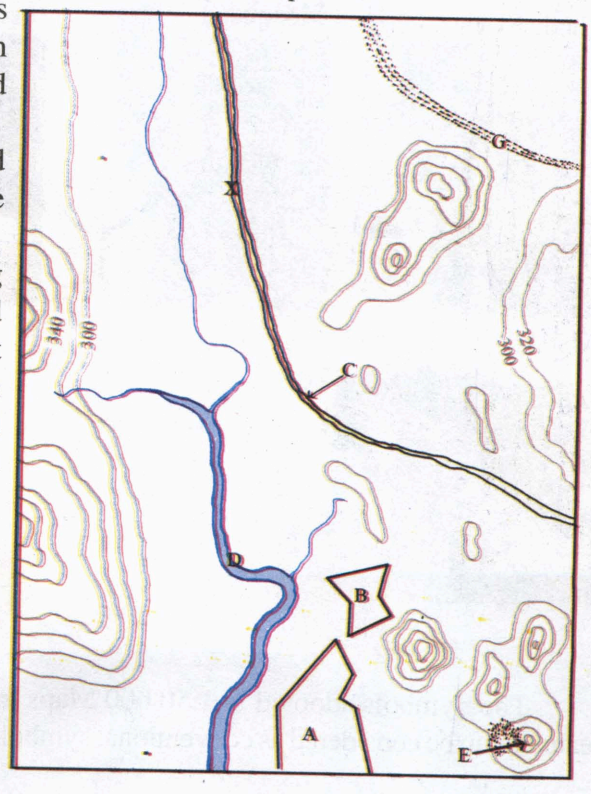
- Availability of water, communication facilities and favourable climate influence the establishment of settlements .
- In river valleys of the lowland areas there are extensive irrigation networks and paddy lands. But over hill slopes and narrow river valleys there are narrow strips of paddy lands.
- Relief features and drainage patterns affect the construction of roads. In the lowland areas the roads are straight lines while over hilly areas the roads consist of many bends. In hilly areas river valleys are made use of in the construction of roads.

Do the following exercises in order to understand the special patterns that are identified in a map.

Exercise 01

1. In your exercise book copy the map using a tracing paper.
2. In appropriate locations write the names of these relief features-conical hill, convex slope, undulating land.
3. Shade in conventional colours paddy cultivation in the region marked A, and garden land in the region marked B.
4. Colour the major road marked "X" with the conventional colour.
5. Draw the minor road starting from point C on the major road which crosses the river at point D and leaves the area at South western corner. Draw the road and the bridge where the road crosses the river.
6. Mark the school, hospital and the post office at the road junction. C is a junction settlement, with permanent buildings. Mark these buildings.

Map 5.16



7. Name the feature shown by letter E
8. Name the administration boundary shown in the North Eastern corner.
9. Draw a suitable linear scale for this Map.
10. Indicate in square kilometres the area of this region.

Exercise 02

Map 5.17 : A section of a Metric Map

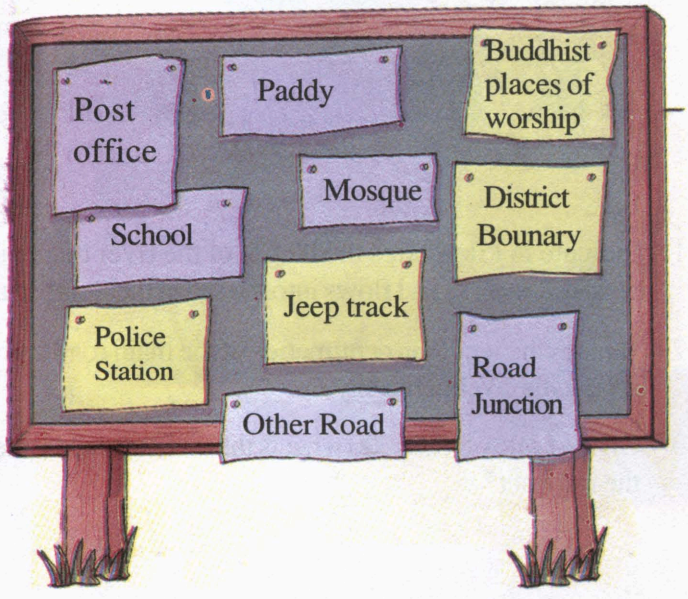
1:50 000

1. Indicate in kilometres the length of the river that enters the region from the northern margin and flows into the sea in the Southern margin.
2. What is the length in centimetres of the main road and the railway line that run around the Weligama bay?
3. On the scale of 1:50 000 what is the distance in kilometres along this road and the rail tract?

Exercise 3

Map 5.18 : A section of a Metric Map

Some of the physical and cultural features that you have observed in Topographic Maps can be identified when you travel along the main road from Dikwella to the North-East corner. Make a list of the features that you would encounter when you travel from South-West to North-East along this road. Select these features from the list, provided.



Competency	Level Competency	Contents	Time
Examines the nature and processes of your living environment	9.1 Examines the distinctiveness of the earth as the blue planet.	9.1.1 Reasons for idendifying the earth as the blue planet. - Water covers 71% of the earth's surface relative to the position of the other planets. - Location of the earth in relation to the sun - Importance of the blue planet as habitat (plant and animal) (Occurrence of day and night, favourable claimate, seasonal variation) - Atmosphere of the blue planet. 9.1.2 Land and water - Land Ridges, plateaus, plains, shields, river valleys, basins - Water Oceans, seas, lakes, rivers, ice cover	12

Competency	Level Competency	Contents	Time
Acts with an understanding of components, characteristics and processes of the physical and human landscape.	9.2 Examines the nature of the physical and human landscape of the Asian region.	9.2.1 Regional identity 9.2.2 Physical landscape - Major land forms (Ridges, plateaus, plains, shields, river valleys, seas and oceans) - Climate - Natural resources (e.g, Forests, petroleum resources, marine resources) (Interrelationship between the above features of the physical landscape and human activities with reference to selected examples) 9.2.3 Human landscape - Distribution of ethnic types - Cultural heritage - Human activities * Agriculture * Industry * Asian economic giants, Newly Industrialized, Countries -NICs	12

Competency	Level Competency	Contents	Time
		9.2.4 Physical and human challenges faced by the Asian countries due to the interaction of physical and human forces - Attempts made to minimze these challenges ASEAN, BIMST-EC, SAARC, APEC	10
Acts with an understanding of how the interaction of physical and human processes influence the physical and human environment.	9.3 Examines the spatial patterns of Sri Lanka's development.	9.3.1 Introduction of spatial patterns of Sri Lanka's development. (This should be on the basis of socio-economic differences relating to development. 9.3.2 Colombo Metropolitan Region 9.3.3 Mahaweli Development Region 9.3.4 Northern Region 9.3.5 Uva Region 9.3.6 Southern Region 9.3.7 Eastern Region	12

Competency	Level Competency	Contents	Time
Adopts positive attitudes conducive to conserve and maintain the physical and human landscapes.	9.4 Contributes to the balanced existence of the planet earth	9.4.1 Recognition of the need to adhere to environmental ethics 9.4.2 Adverse effects of the failure to maintain an environmental balance 9.4.3 Engaging in development while maintaining environmental balance	10
Applies geograpical techniques to analyze, interpret and present data and information	9.5 Recognizes and explains the geographical features in a map	9.5.1 Explains (with reference to scale, orientation and geographical features) spatial information in a section of a map.	08

Notes

Notes


භූගෝල විද්‍යාව (පු) -9
2011/E/09/203/14,000