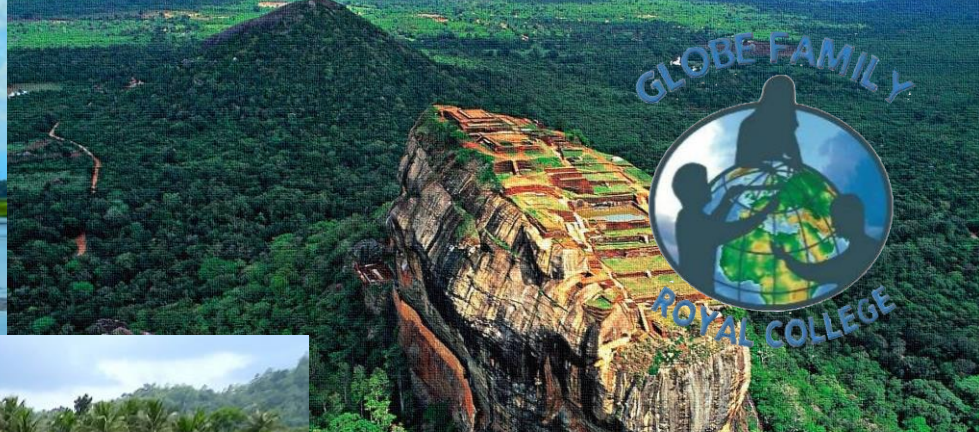
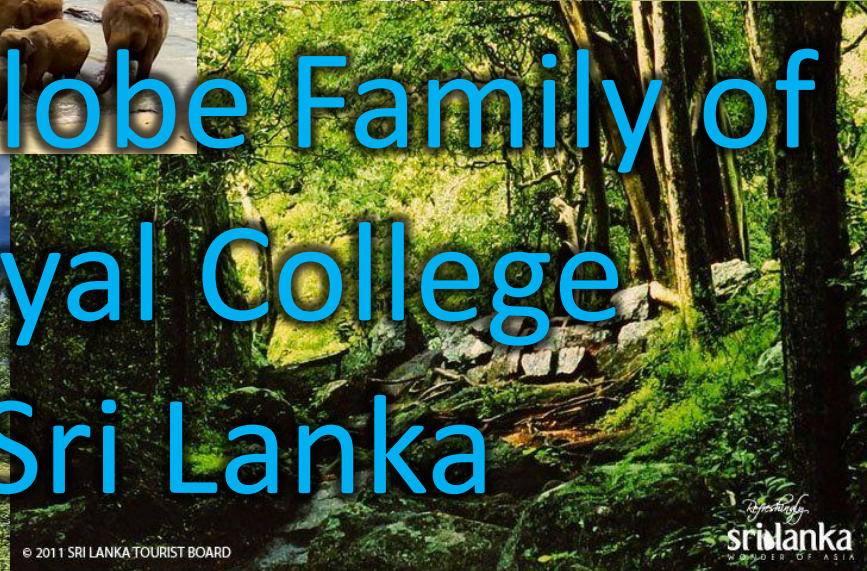




International Virtual Science Symposium 2021



The Globe Family of Royal College Sri Lanka



Project Introduction

The GLOBE Program is hosting the 2021 GLOBE International Virtual Science Symposium (IVSS), which is a project that all schools around the world take part. The IVSS is a way for primary through undergraduate students from all GLOBE countries to showcase their research and hard work. With this project, students learn the practices of science through hands-on investigations in their own communities, sparking their curiosity and interest in science and the globe. This often leads to inquiries that help solve real-world problems and further understanding of our global environment.

This year, the IVSS 2021 will be focusing on **Data Analysis**. We are expected to present a report with the observations of our own countries.

For our report we have included data analysis under 3 topics;

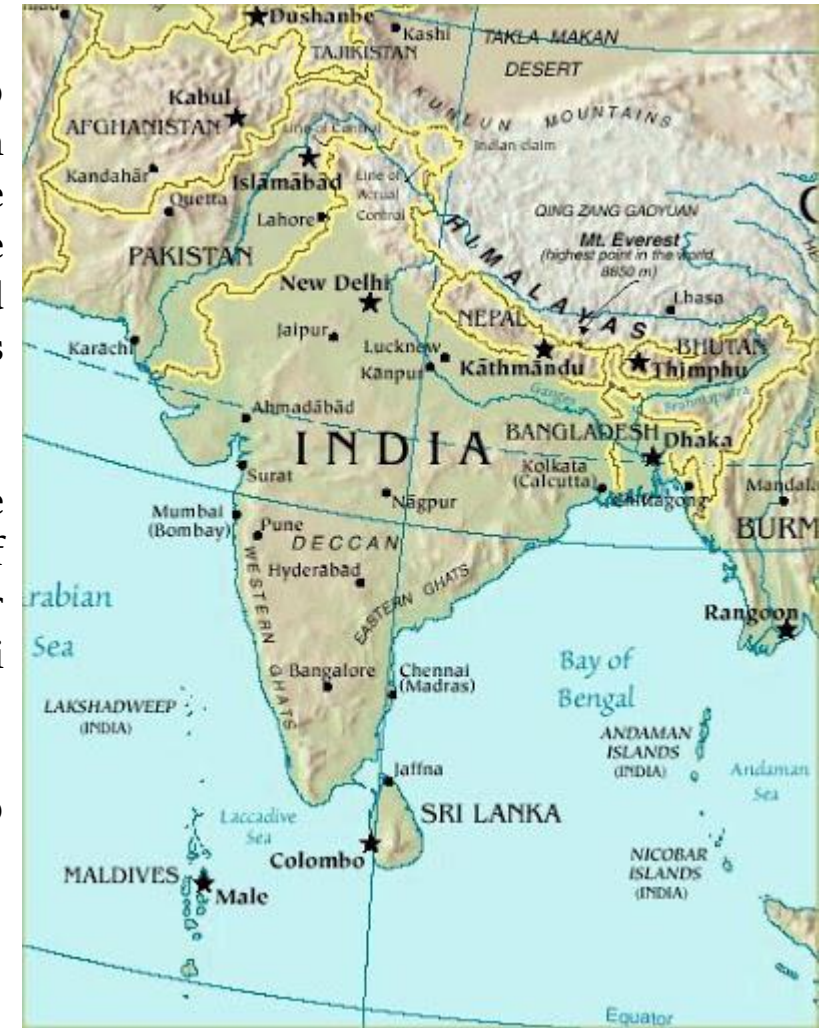
1. Daily Temperature
2. Rainfall
3. Cloud Cover

Sri Lanka

Sri Lanka is a tropical island nation lying between 5° to 10°N, in the Indian Ocean with 65,610 sqkm. It is with a maximum of 432km in length and 224km in width. This small island nation has a population of 21.8 million people with different ethnicity. Majority being Sinhalese community of 75% of the population. Tamils comprises of 15% and 9% Moors of the population. The main religion is Buddhism which comprises of 70% of the population and other religions such as Hinduism, Christianity and Islam practiced in the country. Sri Lanka has rich written history over 2500 years.

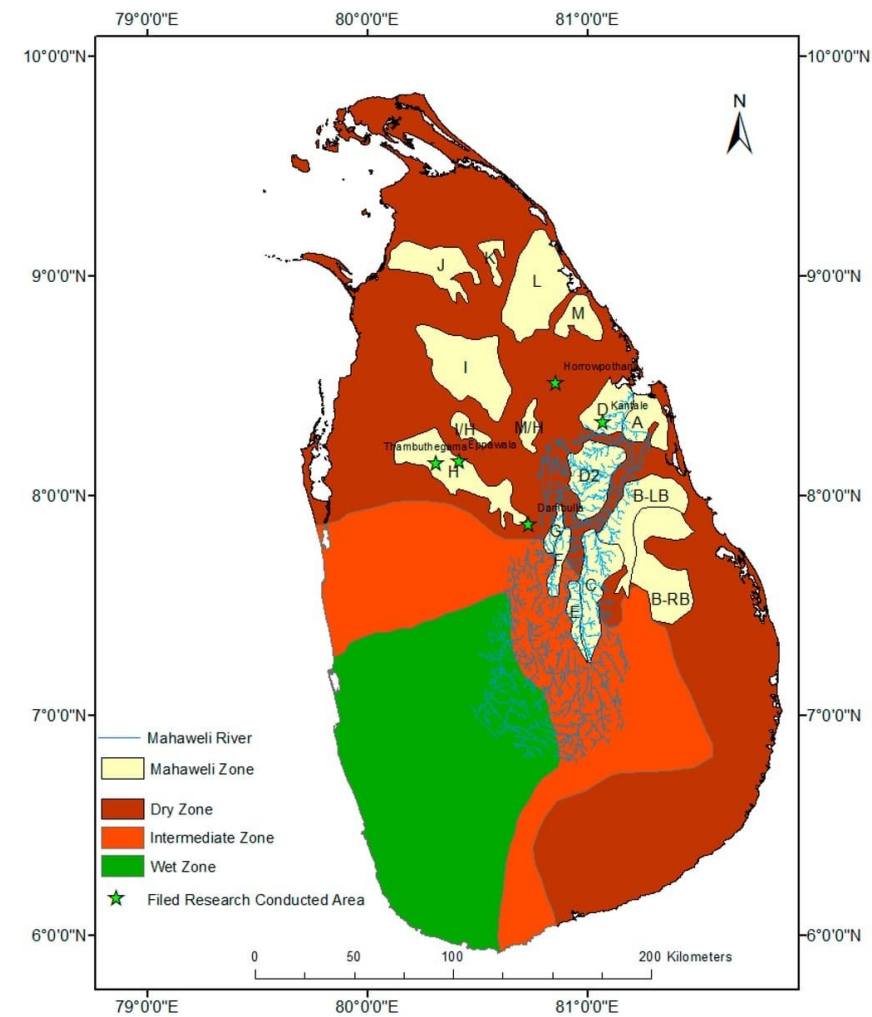
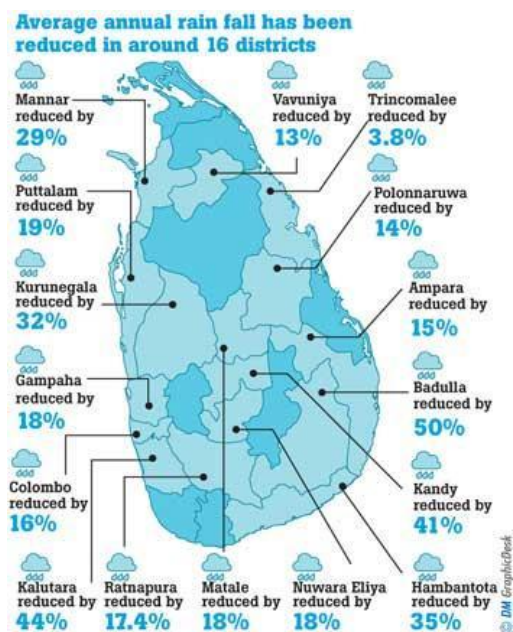
The beauty of this island nation is that it comprises of different types of climates which can be reached within 3 hours of drive. It varies from 10° Celsius to 35° Celsius. The central area of the island is with mountains, plains, natural water falls, lakes etc. Sri Lanka is also famous for wild life and marine life. The wild elephants and leopards are freely trailing in the jungles. Sri Lanka is famous for the Blue whale mammals too.

Sri Lanka is identified as an important location in the maritime industry as it is located just 200 Nautical Miles of the main East West international maritime trade route.



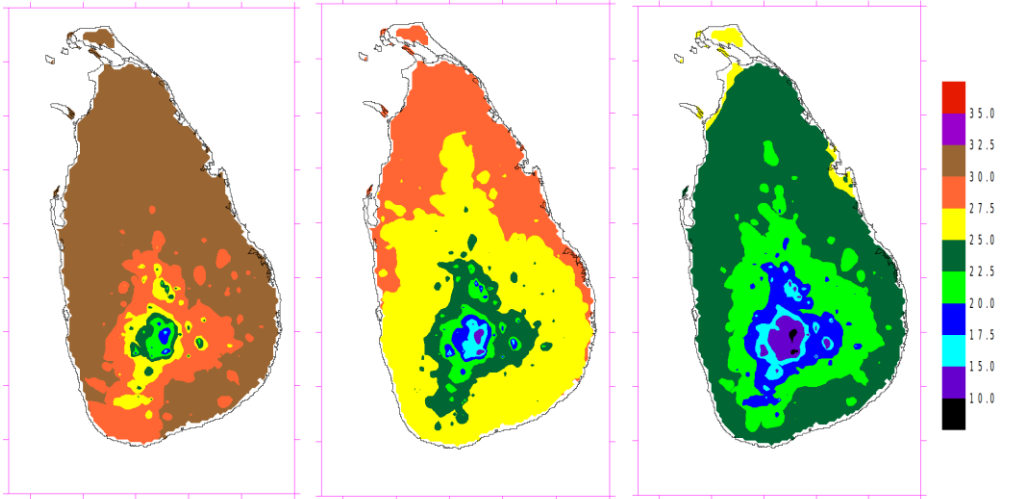
Climate in Sri Lanka

Sri Lanka is a tropical island which consists of very distinctive dry and wet seasons. The average temperature of Sri Lanka ranges from 10D Celsius to 38D Celsius. The temperature in Nuwara-eliya of the hill country is ranges for 10-20 D Celsius whereas temperature in the coastal area ranges from 28-38D Celsius. of the island. The months of December and January are colder months and April and August are the warmest months in Sri Lanka.



Daily Temperature in Sri Lanka

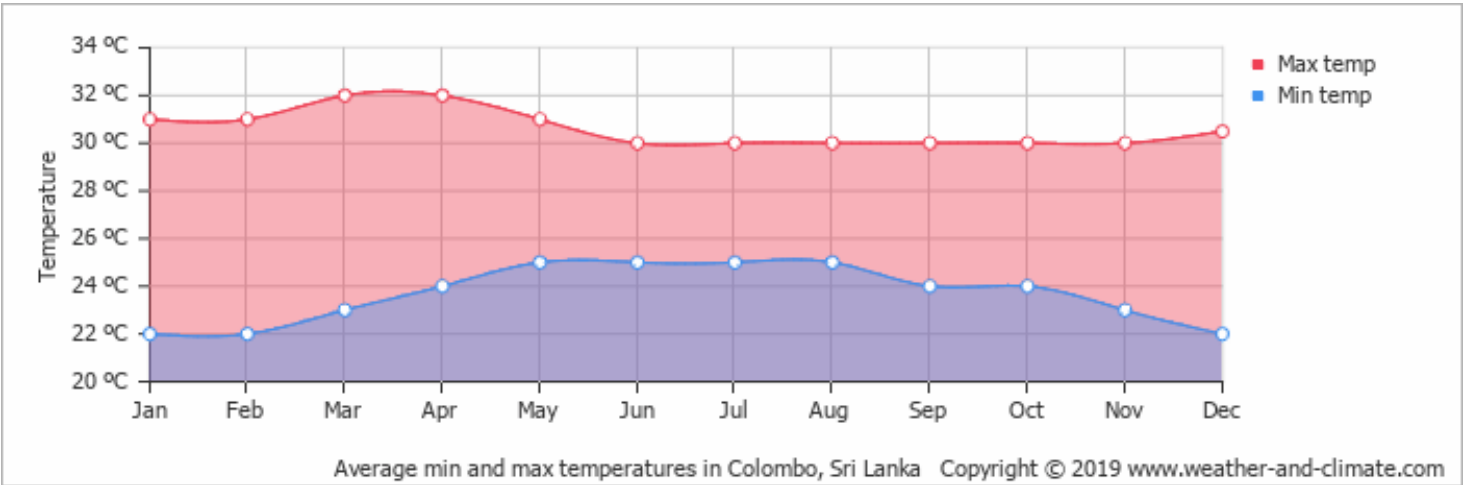
Sri Lanka has an average high temperatures in the 32.2°C (90°F) to 35°C (95°F) range. The average low temperatures in **January** range between a mild 18.3°C (64.9°F) to warm 23.9°C (75°F). Winters are pleasant with relatively less precipitation and ample sunshine. Nuwara Eliya, in the central highlands, at an altitude of 1900 meters, has cool temperatures between 8.9°C (48°F) and 21.1°C (70°F) throughout the year. Winter frost is likely in the high mountains, which receive the least sunshine. The average yearly temperature in Sri Lanka ranges between a warm 27.8°C (82°F) to 30°C (86°F). Temperatures vary from -13.9°C (7°F) to -11.1°C (12°F) between day and night and seasons.



AVERAGE ANNUAL TEMPERATURES

(Computed for the Standard Averaging period of 1961 - 1990 in degrees Celsius)

Department of Meteorology
1st 11-2000

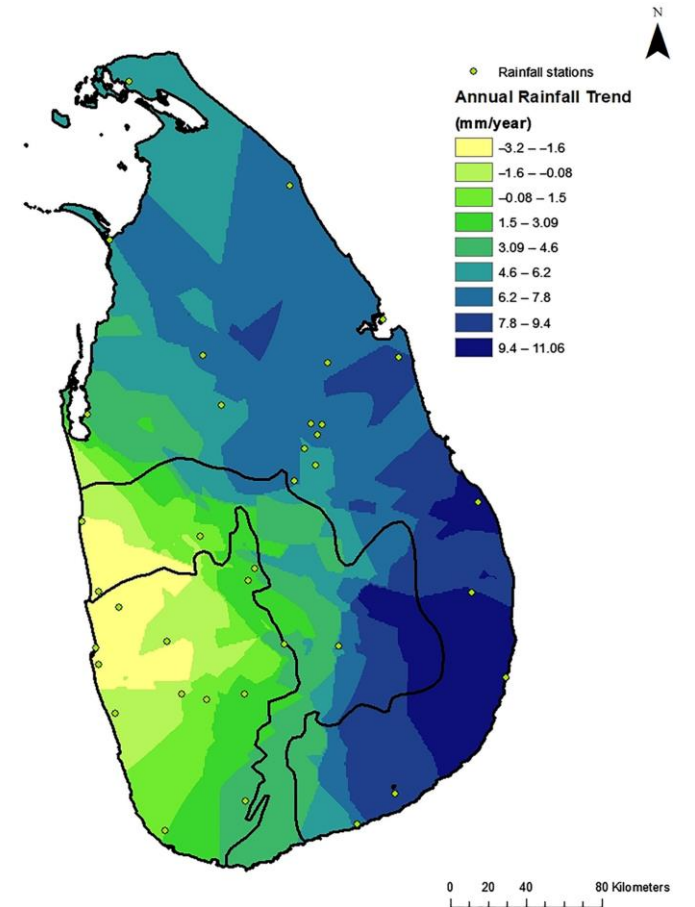
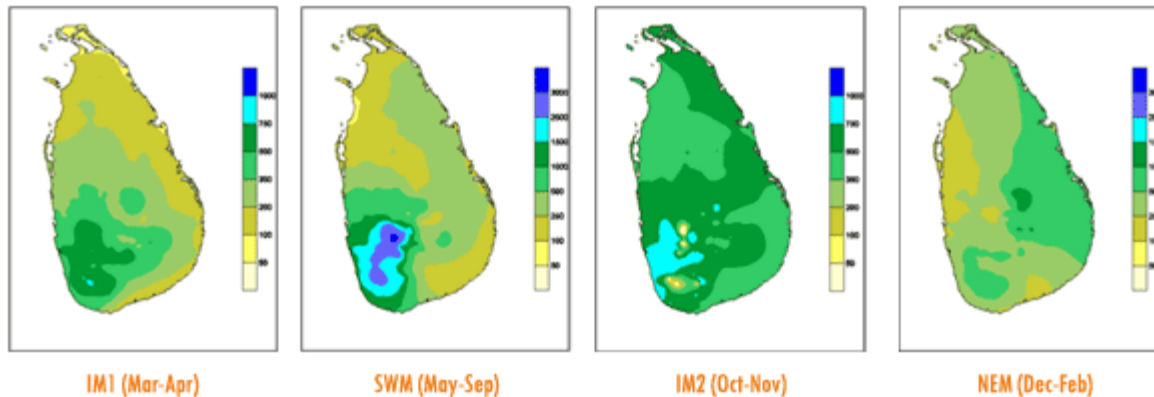


Rainfall in Sri Lanka

Rainfall in Sri Lanka consists of Monsoonal, convectional and expressional while the monsoons play a major role in the share of the annual rainfall. The main annual rainfall is less than 900mm in the South-eastern and north-western (driest) parts of the island to over 5000mm in the western slopes and the central highlands. Colombo which belongs to the wet zone of Sri Lanka receives over 2500mm of rainfall per annum. The 4 monsoons which occur in Sri Lanka are as follow,

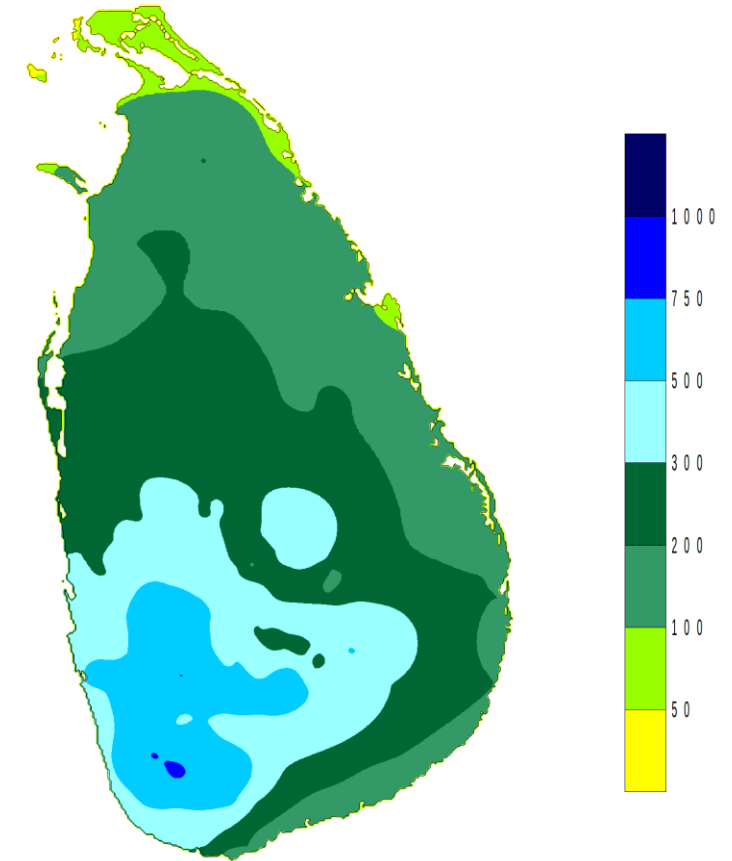
- I. First inter-monsoon Season (March – April)
- II. Southwest-monsoon Season (May - September)
- III. Second inter-monsoon Season (October – November)
- IV. Northeast-monsoon Season (December – February)

Seasonal Rainfall



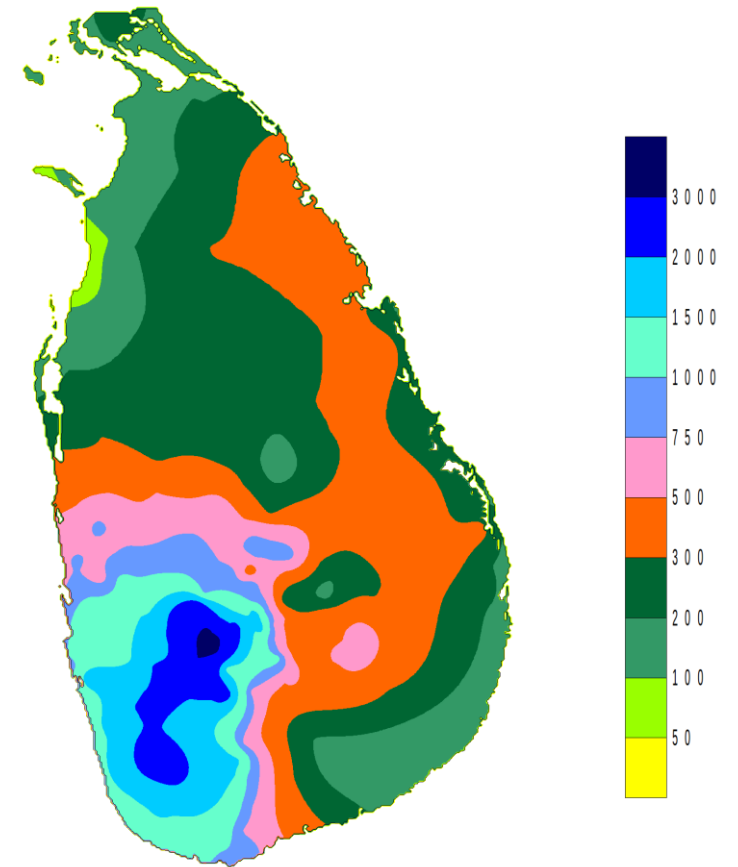
I. First inter-monsoon Season (March – April)

Arm and uncomfortable conditions, with thunderstorm-type rain, particularly during the afternoon or evening, are the typical weather conditions during this season. The distribution of rainfall during this period shows that the entire South-western sector at the hill country receiving 250 mm of rainfall, with localize area on the South-western slops experiencing rainfall in excess of 700 mm (Keragala 771 mm). Over most parts of the island, the amount of rainfall various between 100 and 250 mm, the nortele exception being the Northern Jaffna Peninsula (Jaffna- 78 mm, Elephant pass- 83 mm).



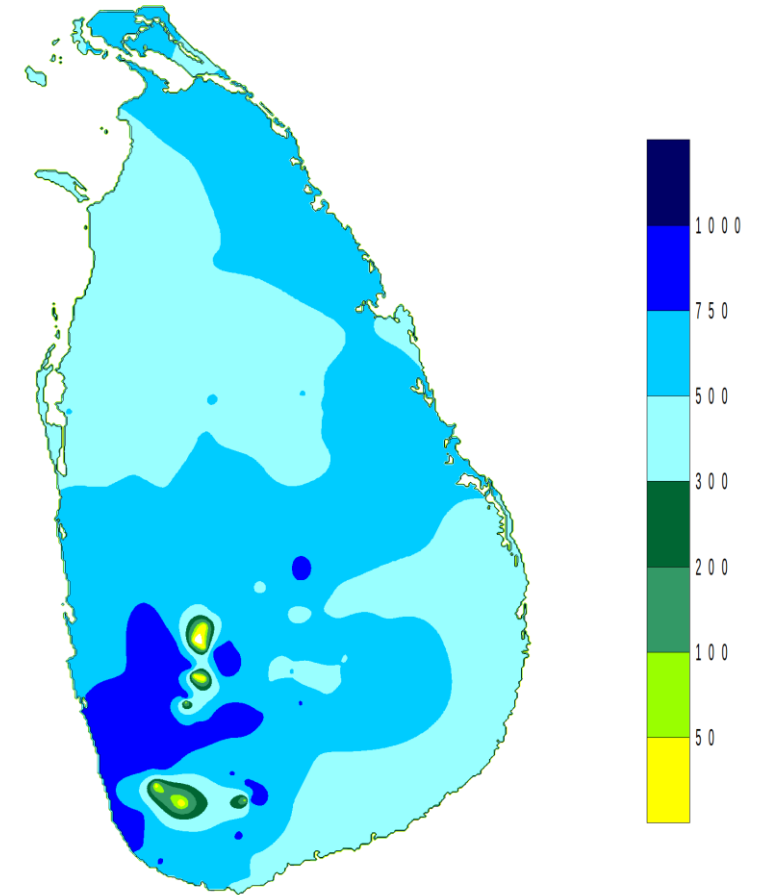
II. Southwest-monsoon Season (May - September)

Windy weather during this monsoon eases off the warmth that prevailed during the 1st Inter monsoon season. Southwest monsoon rains are experienced at any times of the day and night, some times intermittently mainly in the Southwestern part of the country. Amount of rainfall during this season varies from about 100 mm to over 3000 mm. The highest rainfall received in the mid-elevations of the western slopes (Ginigathhena- 3267 mm, Watawala- 3252 mm, Norton- 3121 mm). Rainfall decreases rapidly from these maximum regions towards the higher elevation, as in Nuwara-eliya drops to 853 mm. The variation towards the Southwestern coastal area is less rapid, with the Southwestern coastal belt experiencing between 1000 mm to 1600 mm of rain during this 5 month long period. Lowest figures are recorded from Northern and Southeastern regions.



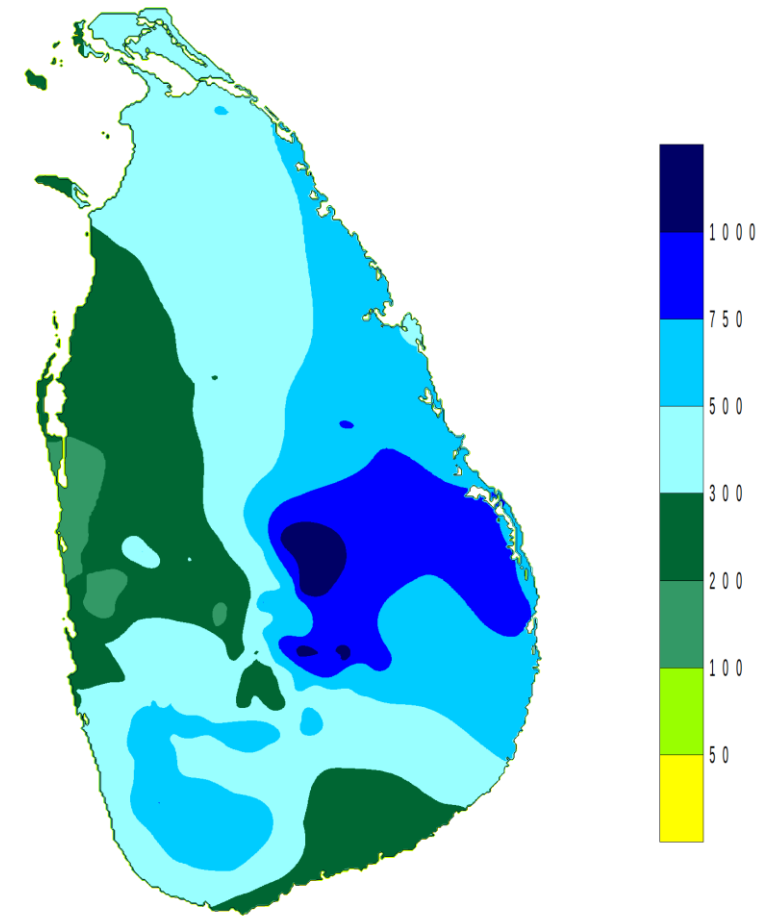
III. Second inter-monsoon Season (October – November)

The thunderstorm-type of rain, particularly during the afternoon or evening, is the typical climate during this season. But unlike in the Inter-monsoon season, the influence of weather system like depression and cyclones in the Bay of Bengal is common during the second Inter-monsoon season. Under such conditions, the whole country experiences strong winds with wide spread rain, sometimes leading to floods and landslides. The second Inter-monsoon period of October – November is the period with the most evenly balanced distribution of rainfall over Sri Lanka. Almost the entire island receives in excess of 400 mm of rain during this season, with the Southwestern slopes receiving higher rainfall in the range 750mm to 1200 mm (Weweltalawa Estate in Yatiyantota recording 1219 mm)



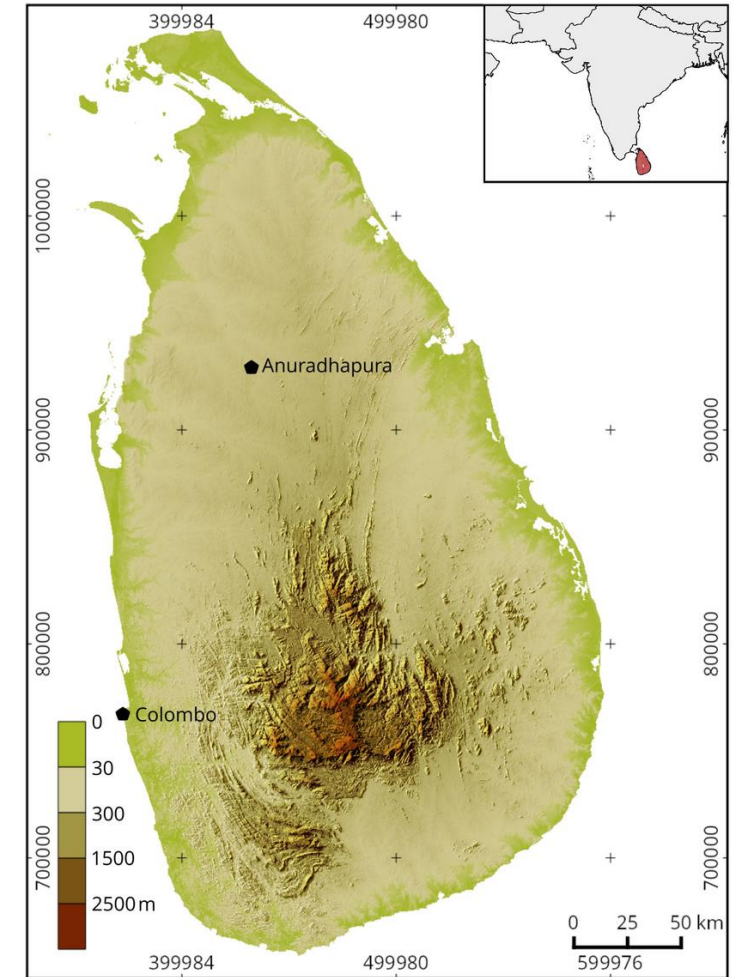
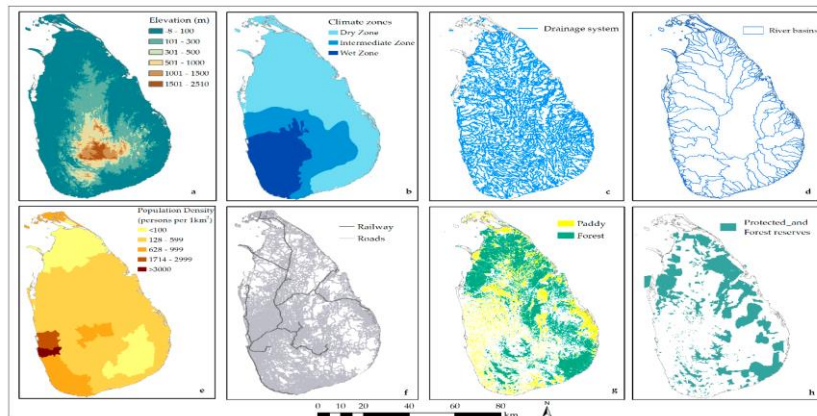
IV. Northeast-monsoon Season (December – February)

The dry and cold wind blowing from the Indian land-mass will establish a comparatively cool, but dry weather over many parts making the surrounding pleasant and comfortable weather except for some rather cold morning hours. Cloud-free skies provide days full of sunshine and pleasant and cool night. During this period, the highest rainfall figures are recorded in the North, Eastern slopes of the hill country and the Eastern slopes of the Knuckles/Rangala range. The maximum rainfall is experience at Kobonella estate (1281 mm), and the minimum is in the Western coastal area around Puttalam (Chilaw- 177 mm) during this period.



Topography in Sri Lanka

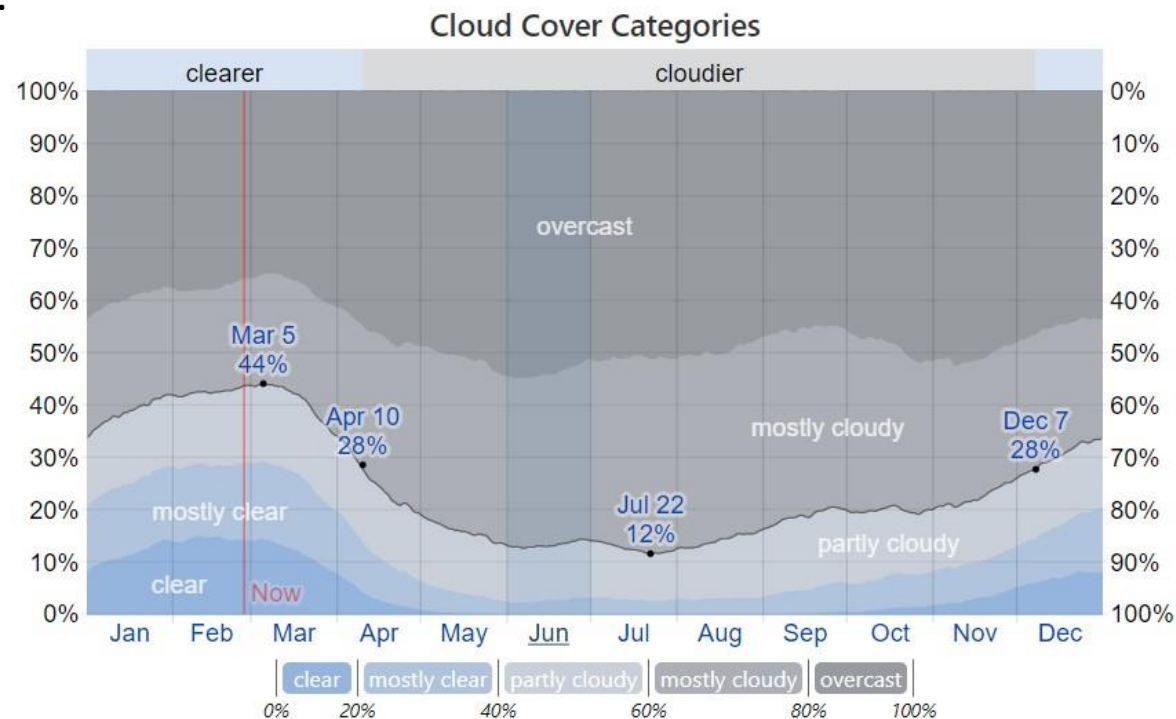
Being an island, Sri Lanka is blessed with a diverse topography which has managed to attract many visitors from around the world. The highlands of Sri Lanka are located in the center of the Southern part of the island. The main highlands consist of a range of topographical features including peaks, plateaus, valleys, basins, escarpments, ridges etc. The rest of the island is quite flat except for the small hills that are found scattered around. These features strongly affect the temperature, seasonal rainfall, wind patterns and humidity of the island which is quite prominent during the monsoon season. The central part of the southern half of the island is mountainous with heights more than 2.5 Km. The core regions of the central highlands contain many complex topographical features such as ridges, peaks, plateaus, basins, valleys and escarpments. The remainder of the island is practically flat except for several small hills that rise abruptly in the lowlands. These topographical features strongly affect the spatial patterns of winds, seasonal rainfall, temperature, relative humidity and other climatic elements, particularly during the monsoon season.



Cloud Coverage in Sri Lanka

In Colombo, the average percentage of the sky covered by clouds experiences *significant* seasonal variation over the course of the year. The *clearer* part of the year in Colombo begins around *December 7* and lasts for *4.1 months*, ending around *April 10*. On *March 5*, the *clearest day* of the year, the sky is *clear*, *mostly clear*, or *partly cloudy* 44% of the time, and *overcast* or *mostly cloudy* 56% of the time.

The *cloudier* part of the year begins around *April 10* and lasts for 7.9 months, ending around *December 7*. On *July 22*, the *cloudiest day* of the year, the sky is *overcast* or *mostly cloudy* 88% of the time, and *clear*, *mostly clear*, or *partly cloudy* 12% of the time.



Method used for Measuring Rainfall

1. Take a bottle with smooth sides, cut off the upper part and turn it upside down on the top of the bottle, to create a sort of funnel (see Figure 1A).
2. Stick a ruler on the side of the bottle and fill the bottle of water up to the zero mark on the ruler, which should be above the bumps at the bottom of the bottle. The bumps would otherwise affect the measurement.
3. Bring your rain gauge outside, as far as possible from buildings and trees.
4. Regularly note the water level (for example, every morning at 8:00a.m. before going to school) to collect your own data. If you plan to take your measurements during the summer, some of the water inside the bottle will evaporate (up to few mm a day) and this will affect your measurements. To avoid this, you can add a thin layer of oil to the water. Since it is lighter than water, the oil will float on the top of the water and prevent evaporation. The measurements you get from your rain gauge will tell you how much rainfall occurred over a certain period of time.

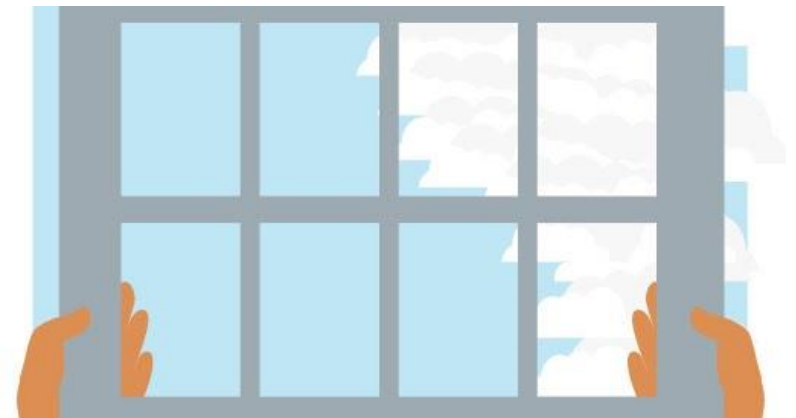
At the end of your experiment, you will have enough data to allow you to make a general assumption of Rain fall easily You'll be surprised at how good you get at guessing how much rain fall there really is!



Method Used for Measuring Cloud Coverage

1. Use the ruler and the crayon or marker to divide your mirror into sixteen equal parts. They do not have to be any certain shape or size, just as long as each $1/16$ of the mirror is the same size as another.
2. Determine the amount of time you wish to measure cloud cover. Do you want to measure the cloud cover for only one day or each day for one week? Do you want to measure the cloud cover for an entire month?
3. Take the mirror that has been divided into sixteen equal parts outside, to the area of your yard where there will be no trees or other objects that reflect off of the mirror.
4. Count the number of sections on the mirror that are reflecting clouds. If two of the sixteen mirrored sections are covered with clouds and is $2/16$. This is, however, a fraction that can be reduced to $1/8$, therefore your okta measurement is 1. If ten of the sixteen sections are covered in clouds, you can convert $10/16$ to $5/8$ and your okta rating would be 5.
5. Repeat these steps for each day that you would like to measure cloud cover.

At the end of your experiment, you will have enough data to allow you to make a general assumption of cloud cover without actually having to measure the oktas. You'll be surprised at how good you get at guessing how much cloud cover there really is!



Method Used for Measuring Temperature

1. Pour rubbing alcohol into the water bottle until it is about $\frac{1}{4}$ of the way full. Add a few drops of red food coloring and gently shake the bottle until the color is mixed evenly throughout the liquid.
2. Insert the straw into the water bottle, but do not allow the straw to touch the bottom of the water bottle. Mold the clay around the straw in order to close the gap and hold the straw in place. The clay should be tight around the straw and cover the bottle mouth completely. The top part of the straw should extend out above the modeling clay. The channel through the center of the straw should remain clear so that the liquid can pass through the straw.
3. *You will need an adult to help with this step.* Heat some water over the stove in a pot or teapot. Carefully pour the hot water into your clear 1-liter container. Place your homemade thermometer into the hot water and watch what happens to the red mixture once immersed in the hot water.
4. Make a scale for your thermometer. Alcohol expands by equal amounts for each gained degree in temperature. This relationship makes it easy to create a measurement scale for temperature. Now you will create a scale for your homemade thermometer by comparing it alongside a store-bought thermometer. You will use a store-bought thermometer to determine the temperature of 4-5 different temperature liquids.

At the end of your experiment, you will have enough data to allow you to make a general assumption of measuring temperature easily. You'll be surprised at how the temperature in our surrounding vary during different climates.



Projects

The Globe Family of Royal College organized many projects to extract information from the environment and analyzed the data.

During the lockdown period we organized many online projects to teach our members to gather data.

