Philippines: Pearl of the Orient Seas

Bayang magiliw, perlas ng silanganan—says the first line of the Philippine National anthem. Sa dagat at bundok, sa simoy at sa langit mong bughaw, the same anthem aptly declares. Composed of more than 7,000 islands and islets, the Philippines continue to “mesmerize” both local and foreign tourists alike. The beauty and splendor of this country is, indeed, second to none for the Filipino whose love is unquestionably for his native land. Perhaps, such patriotism is best expressed with this ending of the Philippine national anthem: Ang mamatay ng dabil sa iyo.

The following article is lifted from lonelyplanet.com’s introduction of the Philippines:

The second-largest archipelago in the world, with over 7000 tropical islands, the Philippines is one of the great treasures of Southeast Asia. Often overlooked by travelers because of its location on the ‘wrong’ side of the South China Sea, the Philippines rewards those who go the extra distance to reach it. And because it’s off the beaten path, the Philippines is a great place to escape the hordes who descend on other parts of Southeast Asia. First and foremost, the Philippines is a place of natural wonders – a string of coral-fringed islands strewn across a vast expanse of the western Pacific. Below sea level, the Philippines boasts some of the world’s best diving and snorkeling, including wreck diving and swimming with the whale sharks. Above sea level, it has a fantastic landscape with wonders enough to stagger even the most jaded traveler: the Chocolate Hills of Bohol, Banaue & the Rice Terraces and fascinating reminders of the islands’ history in places such as Samar & Leyte and Vigan. And if you’re after palm-fringed, white-sand beaches, try laidback Sipalay or flat-out party town Boracay.

Of course, any traveler who has been here will tell you that it’s the people and their culture that makes the Philippines unique. Long poised at the centre of Southeast Asian trade, colonized by a succession of world powers, the Philippines is a vivid tapestry that reflects its varied cultural inheritance. And despite the poverty that afflicts much of the nation, the Filipinos themselves are among the most ebullient and easygoing people anywhere. The Philippines truly qualifies as one of the last great frontiers in Southeast Asian travel. Cross whichever ocean you need to and see for yourself.
Philippine geography (Lifted from Geography and Natural Resources of the Philippines by Domingo Salita, 1997)

Location, Size and Shape

The geographic setting of any region plays a great role in its political, socio-economic, and cultural development. The utilization of nature of the resources, the culture of the people, the socio-economic activities, and the geo-political policies of the state are undoubtedly influenced by its location, size and shape.

Location

Location fixes the permanent position of the place on the surface of the globe. Geographically, the Philippines is a part of Southeast Asia. It is situated between the equator and the Tropic of Cancer. Specifically, it lies between 4° 23’ and 21° 25’ north latitude and between 116° 00’ and 127° 00’ east longitude.

It is bounded on the north by Bashi Channel, on the east by Pacific Ocean, on the south by Celebes Sea, and on the west by the China Sea.

The neighboring countries in the north are Taiwan, China and Japan. In the west, the nearest states are Vietnam, Laos, Cambodia, Thailand and Malaysia. In the south, the country is only a few miles from Borneo and Indonesia.

The Philippines is strategically located with reference to Southeastern Asia and the regions of Indonesia and Australia. Our archipelago guards the approaches to these regions from the north and from the east. This makes the country politically important among the nations of the world and an ideal distribution center of goods within the region. It is also the meeting ground of diverse cultures.

The region between the mainland of Asia and the continent of Australia is an area of potential conflict. We are at the crossroads of the movements of various forces. To safeguard our national interest and security, the Republic of the Philippines entered into a mutual defense pact with the United States and joined the Southeast Asia Treaty Organization. The country is also a member of the Association of Southeast Asian Nations, which advocated that the region of Southeast Asia be declared a zone of peace, freedom, and neutrality.
The Philippines has a maritime or insular location. In this respect, it is similar to Japan. Insular location has an advantage over continental location in the sense that the insular state does not have a common land boundary with its neighbors. The common land boundary is a sensitive spot where conflict of interest usually originates. It is partly because of this insular location that the Philippines is enjoying a comparatively peaceful relation with her neighbors. Our physical separation from the Asian mainland gives us a distinct security advantage. [It should be noted, however that the Philippines is also in conflict with its neighbors due to its claims in the Spratly’s or Kalayaan Islands].

Commercially, The Philippines lies on the major oceanic trade route and air lane plying between the United States and Asia. Culturally, it is the center of the blending of east and west. By virtue of our location, we have contacts with the countries of Asia from which many of our customs, industries, writings, and words in the Philippine languages were derived.

The geographical location of the Philippines in the tropics is greatly responsible for the climatic conditions prevailing in the country. The uniformly high temperature and abundant amount of rainfall that prevails in the archipelago have a direct bearing on our soil, agricultural, forest and water resources.

Size
Size is an important factor in evaluating the economic and political potentialities of a state. Small countries are always handicapped by their limited land resources. The need for adequate space is not only necessary to support a large population but also to provide room for expansion and development. [It should be noted however, that geographical size is not so much significant in terms of its ability to develop or progress—take the case of Singapore for example]

The combined land and water areas of the Philippines is about 1, 800, 000 km$^2$ of which the water areas comprise about five times the land areas. The Archipelago Doctrine is now adopted in the new constitution of the Philippines as a basis in determining the inland and territorial waters of the country.

The total land area of the Philippines, excluding Sabah, is 300, 000 km$^2$ or 30, 000, 000 hectares. It is about the size of Italy, slightly larger than the size of United Kingdom, but slightly smaller than Japan. It is composed of 7, 107 islands and islets of which only 2, 773 are named. Luzon and Mindanao are the two biggest islands, their combined area comprising about 70% of the total land area of the Philippines.

According to the classification of Valkenburg (1961), the Philippines is classified as Large State [states whose areas are between 100, 000 to 500, 000 mi$^2$]. Others are Pakistan, Japan, France, New Zealand, Italy. Other classifications are:

- Gigantic—more than two million square miles [United States, China, Brazil]
- Very Large—with areas between 500, 000 to two million square miles [India, Indonesia, Argentina, Mexico]
- Medium—with areas between 25, 000 to 100, 000 square miles [United Kingdom, Cuba, Greece]
- Small—with areas between 10, 000 to 25, 000 square miles [Taiwan, Denmark, Switzerland]
INTRODUCTION TO PHILIPPINE GEOGRAPHY

- Very Small—with areas between 1,000 to 10,000 square miles [Israel, Kuwait, Lebanon]
- Miniature—with areas less than 1,000 square miles [Bahrain, Vatican, Monaco]

**Shape**

The shape of a country is another geographic element that has a bearing on its economic, social and political development. Compactness and elongation represent the two extremes in shape. The more compact the state is, the smaller is the ratio of its boundary in relation to its area. France is a good example of a compact state since its shape approaches that of a circle. On the other hand, Chile is a typical example of an elongated state since its length is many times longer than its width.

For countries that have more than one unit, three classifications are used namely:

- Broken—where two or more segments are disconnected
- Fragmented—where there are numerous islands but the whole territory occupies a definite area of the globe
- Scattered—where the various parts are found in different parts of the world.

Malaysia is an example for a broken shape for it is made up of three separate parts—Malaya, North Borneo, and Sarawak. Philippines is an example of fragmented shape since it has so many islands all occupying a definite territory. The former British Empire which had territories in all parts of the world was an example of scattered shape.

The Philippines is an elongated and fragmented state, as its parts are disconnected. It appears on the map like broken beads of a rosary. From the economic, social, and political standpoint, such shape of the Philippines is a disadvantage. Construction of a continuous network of roads and railroads throughout the length and breadth of the country is a near physical impossibility. Thus, economic development cannot be accelerated in the absence of good means of transportation and communication. The problems of administration and supervision as well as the implementation of governmental policies cannot be easily carried out because of the physical division of the country. This is one factor that will favor the decentralization of governmental administration.

Socially and politically, the country cannot easily achieve national unity and solidarity. The fragmentary nature of the country is mainly responsible for the regional thinking of the Filipinos. The existence of many tribal and ethnic groups is partly due to the archipelagic character of the nation. This is also the reason why we have so many languages and dialects which hinders the realization of a national language.

In matters of security, the numerous islands and the long coastline make it difficult to defend the country against foreign invasion. Likewise, the apprehension of smugglers and the prevention of illegal entry of aliens have become a major problem of the country due to the presence of many landing beaches in many parts of the archipelago.

On the other hand, a long coastline has its advantage. It provides good fishing grounds, fine harbors, and milder climate due to the existence of land and sea breezes. As to date, the Philippine Government has constructed the Pan Philippine Highway, which starts from Aparri,
Cagayan to Zambangoa City in Mindanao. Two ferry services are made—between Luzon and Visayas and the other between Visayas and Mindanao.

LAND FORMS

The plains, plateaus and mountains are the major topographic features of the Philippines, which in varying combination make up the landforms of the country. Landforms provide the permanent backdrop against which the economic, social and political history of the country is enacted.

**Salient Physiographic/Topographic Features of the Philippines:**

- The irregular configuration of the Archipelago and its fragmentary character consisting of about 7,107 islands and islets;
- The mountainous character of the islands running on a general north to south trend and in close proximity to the coastline;
- The great extent of the coastline reaching a total of 17,640 kilometers, which is twice as long as that of the United States;
- Sulu Sea which lies between Palawan and Mindanao is the largest internal body of water of the country;
- The structural plains lying between mountain systems and the narrow an interrupted coastal plains;
- The few large rivers and many streams which are very short and swift, that descend to the sea;
- The great variety of lakes that are diverse origin of which Laguna de Bay being the largest;
- The big number of active, dormant, and extinct volcanoes, among which Taal Volcano has the most violent eruptions;
- The presence of coral reefs fringing the shores of most the islands, and many islets are made up of corals; and
- The vast extent of the territorial waters within the international treaty limits which comprises more than five times the land area.

The nature of the landforms of the Philippines is such that cultivable lands are found in all part of the country. There is no province that does not have any suitable agricultural land. It is, however, noted that although the highlands are not rugged, the level lands of the country are not extensive. This is a handicap in mechanized agriculture.

Starting from Northern Luzon, the western side is occupied by the Ilocos Coastal plain flanked in the east by the Central Cordillera. Cagayan Valley lies between the Central Cordillera and the Sierra Madre Mountains that extend to the shores of the Pacific Ocean. In Central Luzon, the western margin is occupied by the Zambales Mountain system, then by the Central Plain; in the east is a continuation of the Sierra Madre. Southern Luzon has a diverse topography of volcanic upland, lake regions and plain areas. Plain areas for agriculture
are available in both Southwestern Luzon and the Bicol region. The Bicol plain is the most extensive level land of Southeastern Luzon.

In the Visayas, the islands have mountainous cores. The arable lands are found along the coasts, although some interior plains are found in Panay and Leyte. The sugar lands of Negros may be considered as both coastal and interior plains.

Mindanao offers a complex topography. There are three principal mountain ranges: (1) the mountain ranges which form the backbone of Zamboanga Peninsula and Misamis Occidental; (2) the Central Highland extending from north to south following the western boundary of Agusan and Davao where Mt. Apo is located; and (3) the Diwata Mountains in the east following the coast. The Lanao-Bukidnon plateau and the Tiruray tableland are the principal plateaus while the Cotabato Valley and Agusan-Davao Lowland are the principal plains. The coastal plains throughout Mindanao are also suitable and are centers of settlements.

**Origin of the Philippine Landforms**

The present landforms of the Philippines have come about through the complex process of diastrophism, vulcanism and gradation. These landforms are very much interrelated with origin of the Archipelago itself. The occurrence of tectonic earthquake is an effect of diastrophism. The formation of elongated mountains such as the Sierra Madre and the Cordillera is caused by diastrophism while the conical peaks are the result of vulcanism. Mt. Apo, Mayon Volcano and Kanlaon Volcano are examples of volcanic mountains. The erosion of the highlands and the consequent deposition of the sediments at the oceanic basin comprise the process of gradation. It is gradation that generally causes the formation of minor landforms, such as rivers, valley, lakes, deltas, hills, rapids, and falls. The deltas formed by Pasig River and Pampanga River as they enter Manila Bay are the results of gradation process.

The location of Philippines on the western margin of the Pacific Ocean, which is comparatively unstable segment of the earth’s crust may help explain the pattern of landform development. The entire margin of the Pacific Basin from Kamchatka to Japan, Taiwan, Philippines, Indonesia, and New Zealand owes much of its development to the action of the forces of folding, faulting, and volcanic activity. This region has been called by many geologists as the “girdle of fire” or “ring of fire” because it is a region of the frequent volcanic activity.

**Destructive Earthquakes in the Philippines**

1968 August 02 -- Ms7.3 -- Casiguran Earthquake
1973 March 17 -- Ms7.0 -- Ragay Gulf Earthquake
1976 August 17 -- Ms7.9 -- Moro Gulf Earthquake
1983 August 17 -- Ms6.5 -- Laoag Earthquake
1990 February 08 -- Ms6.8 -- Bohol Earthquake
1990 June 14 -- Ms7.1 -- Panay Earthquake
1990 July 16 -- Ms7.9 -- Luzon Earthquake
1994 November 15 -- Ms7.1 -- Mindoro Earthquake
1996 May 27 -- Ms5.6 -- Bohol Earthquake
1999 June 07 -- Ms5.1 -- Bayugan Earthquake
2002 March 06 -- Ms6.8 -- Palimbang Earthquake
2003 February 15 -- Ms6.2 -- Masbate Earthquake

Some Active Volcanoes in the Philippines

<table>
<thead>
<tr>
<th>Name of Volcano</th>
<th>Province</th>
<th>Elevation (Km)</th>
<th>No. of Historical Eruptions</th>
<th>Latest Eruption/Activity</th>
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<tr>
<td>Babuyan Claro</td>
<td>Cagayan (Babuyan Islands)</td>
<td>0.843</td>
<td>4</td>
<td>1917</td>
</tr>
<tr>
<td>Banahaw</td>
<td>Laguna, Quezon</td>
<td>2.169</td>
<td>3</td>
<td>1843</td>
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<td>Bulusan</td>
<td>Sorsogon</td>
<td>1.565</td>
<td>16</td>
<td>2006 March 21- June 28</td>
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<tr>
<td>Cagua</td>
<td>Cagayan</td>
<td>1.160</td>
<td>2</td>
<td>1907</td>
</tr>
<tr>
<td>Camiguin de Babuyanes</td>
<td>Cagayan (Babuyan Islands)</td>
<td>0.712</td>
<td>1</td>
<td>1857</td>
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<tr>
<td>Didicas</td>
<td>Cagayan (Babuyan Islands)</td>
<td>0.228</td>
<td>6</td>
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<tr>
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<td>Camiguin</td>
<td>1.332</td>
<td>5</td>
<td>1948 Sept. 31 - 1953 July</td>
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<tr>
<td>Iraya</td>
<td>Batanes</td>
<td>1.009</td>
<td>1</td>
<td>1454</td>
</tr>
<tr>
<td>Iriga</td>
<td>Camarines Sur</td>
<td>1.143</td>
<td>2</td>
<td>1642 Jan. 4</td>
</tr>
<tr>
<td>Kanlaon</td>
<td>Negros Oriental</td>
<td>2.435</td>
<td>26</td>
<td>2006 June 3-July 25</td>
</tr>
<tr>
<td>Makaturing</td>
<td>Lanao del Sur</td>
<td>1.908</td>
<td>7</td>
<td>1882</td>
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<tr>
<td>Matutum</td>
<td>Cotabato</td>
<td>2.286</td>
<td>1</td>
<td>1911 March 07</td>
</tr>
<tr>
<td>Mayon</td>
<td>Albay</td>
<td>2.460</td>
<td>48</td>
<td>2006 July 14 (ongoing)</td>
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<tr>
<td>Pinatubo</td>
<td>Boundaries of Pampanga, Tarlac and Zambales</td>
<td>1.445</td>
<td>2</td>
<td>1992 July 09 - August 16</td>
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<tr>
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<td>Cotabato</td>
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<td>Smith</td>
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<td>Taal</td>
<td>Batangas</td>
<td>0.311</td>
<td>33</td>
<td>1977 Oct. 3</td>
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Active Faults and Trenches in the Philippines (based on the map provided by Philippine Institute of Volcanology and Seismology, 2000 with modification)
Philippine Volcanoes (as of 1997)
**The Pacific Theory**

A study of the nature of the rocks beneath the ocean and the volcanic character of the archipelago made Dr. Bailey Willis conclude that the Philippines was formed through the marginal and peripheral eruptions of the Pacific Basin. The eruptions of the submarine volcanoes during the remote geologic past and the piling up of their extrusives caused the emergence of the islands above the sea, giving rise to the Philippine Archipelago.

**The Asiatic Theory**

A more rational theory holds view that the Philippines was once a part of the continental shelf of Asia. Dr. Leopoldo Faustino (1928) stated that:

The present land areas of the Philippines are merely the higher portions of a partly submerged mountain mass... The outline of the Archipelago was first marked at the close of the Paleozoic Era during the Permian Revolution when a movement of the Asiatic land mass to the south caused the China Sea depression and crumpled the edge of the continental platform. In other words the Philippine Islands formed the barrier that separated the waters of the Pacific Ocean from the waters of the present China Sea.

The Permian Revolution referred to above is an important event in geologic history, which took place some 200 million years ago. It was characterized by a worldwide mountain-building movement. It was during this period that the outline of the Philippines was believed to have been brought for the first time above sea level.

**Landforms and Economic Development**

Plains, under proper climatic conditions, provide the most favorable sites for economic and social progress. Plains are the lowlands of a continent. History tells us that the cradles of ancient civilization started in the delta of the Nile River and in the valleys of Tigris-Euphrates Rivers. These places were fertile, and the rivers provided not only natural irrigation but also the highways for transportation and commerce. Due to the advantages plains offer for settlement and agricultural development, the greater bulk of the world’s population are concentrated in the lowlands.

This situation is also true in the Philippines where the plains are better developed and thickly populated. And such situation will remain to be true even after the country has attained agro-industrial economy. This is expected because manufacturing industries are generally built on plains where the ease of transportation facilitates the bringing of raw materials to the factories as well as the distribution of finished products to the consumers.

From the standpoint of agricultural development, the topography of the land is the most important factor that limits its productivity. Slope, which is an element of landform, is a critical factor. Where the slope is steep, the area becomes unfit for agriculture. Soil erosion proceeds at a faster rate since the topsoil, which is rich in humus, is easily eroded and the soil becomes unproductive. This is true in the Philippines.
Considering the country’s landform and climate, giving the allowance for settlement, and industrial and commercial purposes, it is estimated that about 45 percent of the land area of the Philippines is suitable for cultivation. Comparing it with Japan, it is significant to note that only 16 percent of the total land area of Japan is arable. It is reasonable then to state that the landforms of the country as a whole is favorable for economic development. There are no very high mountains and very steep slopes in the country. However, the drawback is that the level lands are not extensive enough which could be a handicap in mechanized farming.

**CLIMATE OF THE PHILIPPINES**

Life of man is related to climate in several ways. It influences the kind of crops that he can raise, the kind of clothing that he will wear, and the kind of shelter that he may build. Climate is one of the factors that affect the vitality, energy, and attitudes of man.

**WEATHER & CLIMATIC ELEMENTS**

To understand the climate of the Philippines, which is comparable to that of Central America, it is important to understand the elements of weather and climate. Weather is the condition of the atmosphere at a given time and place. This condition is temporary in nature. It may last for a few minutes, hours or days only. It is expressed by a combination of several elements, primarily (a) temperature; (b) humidity; (c) precipitation; (d) pressure and (e) winds. Climate on the other hand, is a generalization of day-to-day weather conditions taken over a longer period of time. Climate is permanent in character.

*Temperature*

Based on the average from all weather stations in the Philippines taken for a period of 15 years, excluding those from Baguio and Silang, Cavite, the coolest month falls in January with a mean temperature of 25.4 degrees Celsius when it is winter in the northern hemisphere while the warmest month occurs in May with a mean temperature of 28.1 degrees Celsius. Accordingly, using the temperature and rainfall as the basis, the climate of the country is divided into three seasons: hot dry season from March to May; rainy season from June to November; and the cool dry season from December to February.

Owing to the insular nature of the Philippines, the sea and land breezes make the temperature of the country quite agreeable. With the exception of April and May, the nights are comparatively cool throughout the year.

*Case in point:* Baguio, with an elevation of about 1, 500 meters, has an average annual temperature of 17.9 degrees Celsius, which is 9 degrees Celsius cooler than the neighboring lowland city of San Fernando, La Union. This makes the temperature of Baguio comparable with that of a temperate climate. Because of its invigorating climate, Baguio was made the “Summer Capital of the Philippines”. This mean annual temperature of 17.6 degrees Celsius is very close to the optimum temperature of 18 degrees Celsius. Dr. Huntington, in his *Principles of Human Geography* called attention to the fact that people’s health and strength are greatest when the
thermometer drops to 14 degrees Celsius to 16 degrees Celsius at night, and rises to 21 degrees Celsius or 24 degrees Celsius by day, the average being 18 degrees Celsius. Man can work more efficiently under this temperature.

Humidity

Humidity refers to the moisture content of the atmosphere. When the temperature is warm and the place is near bodies of water, more moisture is evaporated to the clouds. The warmer the air the more moisture it can hold and when it is fully saturated, we say that the relative humidity is 100%. Relative Humidity is the ratio of the actual moisture content of the atmosphere to that which it can hold to be saturated at the same temperature.

The conditions of humidity have much to do with comfort and health as do temperature and winds. When the weather is warm and the humidity is high, the rate of evaporation from the human body is retarded, thus increasing the sensible temperature. With high temperature and high humidity, one perspires with the slightest exertion, making the body uncomfortable. In the Philippines, the annual mean relative humidity varies from 76.7% to 85.7%. Baguio has the highest annual mean of 85.6%, while the stations with the least annual mean relative humidity are Dagupan, Manila Vigan and Cebu.

Rainfall/Precipitation

Rainfall is more important in the Philippines as a climatic element that temperature. Rainfall distribution throughout the country varies from one region to another due to topography and the wind systems.

During the cool months, the rains in the Philippines are mainly due to the northeasterly air currents, which come directly from the Pacific Ocean causing rainfall over the eastern part of the archipelago. These are the so-called northeast-monsoon rains.

From January to May, rainfall is heaviest in the eastern part of the country, with precipitation mostly concentrated on southeastern Samar and the northeastern Mindanao. From June to September, the rains are more abundant in the western part, August being the wettest month. This is due to the effects of the southwesterly winds and the influence of typhoons. From October to December, rainfall concentration shifts again to the eastern portion of the country. Based on records, it was observed that the wettest months in the country was from July to August. It is for this reason why a proposal was made to make July and August th vacation months and start the school calendar in September of every year. On the other hand, March, April, May are the driest months of the country.

Based on the distribution of rainfall, four climatic types are recognized.

Type 1. Two pronounced wet and dry seasons; wet during the months of June to November and dry from December to May. This type of climate is found in the western part of Luzon, Mindoro, Palawan, Panay and Negros. These regions are shielded from the northeast monsoon and even in good part from the trade winds of high mountain ranges, but are open to southwest monsoon and cyclonic storms.
Type 2. No dry season with a very pronounced maximum rain period in December, January and February. Catanduanes, Sorsogon, eastern part of Albay, Camarines Norte, Camarines Sur, eastern Quezon, Samar, Leyte and eastern Mindanao have this type. [Note: The tragic death caused by continuous rains and consequent landslides in Leyte last December 2003]

Type 3. This is an intermediate type with no pronounced maximum rain period and a short dry season lasting from one to three months only. Areas under this type are the western parts of the Cagayan Valley, the eastern part of the Mountain region, southern Quezon, Masbate, Romblon, northeastern Panay, eastern Negros, central and southern Cebu, eastern Palawan and northern Mindanao. These localities are only partly sheltered from the northeast monsoon and trade winds and are open to the southwest monsoon or at least to frequent cyclonic storms.

Type 4. Uniformly distributed rainfall. The regions affected by this type are the Batanes, northeastern Luzon, southwestern part of Camarines Norte, western parts of Camarines Sur and Albay, eastern Mindoro, Marinduque, western Leyte, northeastern Cebu, Bohol and most of central, eastern and southern Mindanao. These regions are so situated that they are open to the northeast monsoon and trade winds as well as the southwest monsoon and the cyclonic storms.

Pressure and Winds

The existence of winds is dependent on the difference in pressure, which in turn is caused by the difference in temperature. Wind moves from high pressure to low pressure areas. The higher the difference the greater is the velocity of the wind. Thus, a falling barometer is to be taken as sign of an approaching storm but if the pressure starts increasing gradually, it marks the coming of a fair weather.

Pressure and winds exert a profound effect on the temperature and precipitation. A minor change in pressure may cause a change in the velocity and direction of the wind. A change in movement of the wind may produce changes in temperature, which may in turn affect precipitation. Such a succession of events may produce a variety in weather and climatic conditions.

In the Philippines, there are three important air movements: (a) **trade winds**, (b) **southwest monsoon (habagat)**, and (c) **northeast monsoon (amihan)**.

The trade winds originate in the high pressure area of the eastern north Pacific Ocean. After crossing the vast expanse of the Pacific in a westerly direction, it reaches the Philippines from the northeast or east direction, depending upon the existence of a low pressure area. This is the wind that predominates during the months of February to May, which are periods of dry season in many parts of the country. Although this wind system comes from the eastern North Pacific Ocean, it is the least moist of the three streams.
Climate map of the Philippines.

(Source: http://sabinefabris.girlshopes.com/climatemapofthephilippines/)

**FREQUENCY OF TROPICAL CYCLONES**

<table>
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<th>Rare</th>
<th>Less frequent</th>
<th>Frequent</th>
<th>Frequent</th>
<th>Very frequent</th>
<th>Very frequent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>7%</td>
<td>19%</td>
<td>16%</td>
<td>32%</td>
<td>25%</td>
</tr>
</tbody>
</table>

**Legend:**
- Type I: No dry season, dry period from November to April.
- Type II: No dry season, dry period from November to January.
- Type III: Seasons not very pronounced.
- Type IV: Rainfall more or less evenly distributed throughout the year.
The southwest monsoon is the deflected southeast trades of the southern hemisphere. As the southeast trades cross the equator, they are due to the rotation of the earth, deflected to the right thus approaching the Philippines form the southwest quadrant. This monsoon blows from May to October when it is winter for part of the time in the southern hemisphere. The stream gathers enough moisture from the sea and, due to the warm temperature at the equator, the active convective movements carry the moisture upward to great heights, causing strong winds and rains.

The northeast monsoon, which is often times called the “northerns”, blows during the months of November to February. This is the period when it is winter in the northern hemisphere. High pressure areas develop in Siberia and Manchuria and, due to the rotation of the earth, the wind system approaches the Philippines in a northeasterly direction. This gives us our coldest temperature throughout the country.

**Typhoons**

Typhoons frequently visit the Philippines. Typhoons originate from the intertropical convergence zone (ITCZ)—the meeting of place of the northerns and southwestern monsoon whose position passes between Mindanao and Luzon. They specifically originate from the region of the Marianas and Caroline Islands of the Pacific Ocean. These typhoons are classified as (a) **destructive** —a natural hazard that occur in any place traversed by the cyclonic center, causing great damage to life and property. The (b) **ordinary** is one that does not cause much damage and is looked upon as a blessing because it brings with it cloudiness, rainfall, and a reduction in temperature.

The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), sends out warnings or typhoon signals.

- **Public Storm Signal No. 1**—indicates that wind velocity of from 50 to 60 km/hr and is expected in the locality within 24 hours.
- **Public Storm Signal No. 2**—means that winds with a velocity of from 61 to 100 km/hr may be expected in the locality within 24 hours.
- **Public Storm Signal No. 3**—indicates that winds with a velocity of from 101 to 185 km/hr may be expected in the locality within the next 12 hours.
- **Public Storm Signal No. 4**—has a wind velocity of 185 km/hr or more. Strong winds accompanied by heavy rains pose a great danger to life and property.

**Tropical cyclones/typhoons that caused most deaths in the Philippines**

- Tropical Storm Uring [Thelma] of 1991 -- 5,080 deaths
- Typhoon Nitang [Ike] of 1984 -- 1,029 deaths
- Typhoon [Trix] of 1952 – 995 deaths
- Typhoon [Amy] of 1951 – 991 deaths
- Typhoon Rosing [Angela] of 1995 – 936 deaths
Climate and Economic Development

A study of the highly developed countries of the world particularly the United States, Great Britain, Germany, Belgium Sweden and Japan reveals that these countries are located in the temperate regions. It was once asserted that only in temperate climates do people have the necessary energy to work hard and produce, to acquire new knowledge and advance their economic condition. On the other hand, climate in the tropics was said to sap the energy of the inhabitants so that physical tasks are postponed and mental effort avoided. This study now is discredited. The climate simply influences the activities of man, but it is man who decides and determines the progress of a nation.

The modern view is that a tropical environment does not challenge man to give his best. Life is comparatively easy. Plants for food are grown abundantly without much effort. The soil can be made to yield crops throughout the year. Since there are no winter seasons, clothing and shelter is minimal. It is then outside the tropics, where there are winter seasons and shortages of water supply that man was forced to prepare himself for these difficulties.

From the standpoint of human activity, the climate in the Philippines is reasonably favorable for socio-economic development. A book entitled, The Commonwealth of the Philippines, described the climate in the Philippines as the most healthful and comfortable of any portion of the tropics inhabited by man. The enormous amount of rainfall and presence of enormous moisture, properly conserved and utilized, will increase the agricultural output of the country. And with the use of irrigation systems and better quality of seeds and crop combinations, an efficient system of farm management can be evolved.

For industrial development, the abundance of rainfall has given us good sources for water power. In the absence of commercial natural oil, we have to turn to our hydro-electric plants for generating cheap electricity.

NATURAL RESOURCES OF THE PHILIPPINES

Fundamental law on Natural Resources. Article XII of the 1987 Philippine Constitution, entitled The National Economy and Patrimony provides for the exploration, development and utilization of natural resources in the country.

The Bureau of Forest Development is entrusted by law to classify lands of the Public Domain into timberland and agricultural land. Until the land is classified as agricultural land, the Bureau of Lands cannot alienate or dispose such land. If the land is found to be more valuable for mining purposes than for either timber or farming, then the land will be classified as mineral land. The Bureau of Mines is directly responsible in the administration and disposition of the mineral lands of the country.

Classification Natural Resources

From the scientific standpoint, the natural resources of the country may be classified into: waters, soils, forests, minerals and fishery resources. Agricultural resources such as
crops, livestock and cultured fisheries are strictly speaking not part of the natural resources since they are the results of the industry of man. Natural resources may also be classified as inexhaustible, renewable, or non-renewable. Inexhaustible are those that are not destroyed like water. Forestry, fishery and wildlife are the renewable resources. Minerals like coal and oil are non-renewable because once they are consumed, they are gone forever.

**Water Resources.** The Philippines has numerous rivers of various significance. In Luzon, Cagayan and Agno rivers are the most outstanding. Cagayan River—the longest in the Philippines, has made Cagayan Valley very fertile, and the richest tobacco-growing region in the country. The Agno River has been developed for hydroelectric power. In Mindanao, the Agusan River and Rio Grande de Mindanao are of prime importance in the region.

Besides rivers, the Philippines has also numerous lakes. The most important lakes are Laguna de Bay, Lake Bombon, Lake Mainit and Lake Lanao.

**Soil Resources**

**Classification of Soils**

1. Alluvial Soils. These are the best agricultural soils of the country as they are the most fertile. These soils have been formed through the agency of water. Materials are derived from the highlands and brought down to the plains and valleys through erosion. These may be of fine or coarse textures. Fine alluvial soil is found in the Central Plain of Luzon, Cagayan Valley, Panay Plain and plains of Rio de Mindanao. This soil is conducive for rice growing. Coarse alluvial soil is found in Pampanga, Tarlac, Negros Occidental and Iloilo. Sugarcane grows well in these regions.

2. Shales and Sandstone Soils. These are soil derived from the weathering of two sedimentary rocks—shale and sandstone. Shale soil is clayey, which is often dark brown, plastic and sticky. When dry, it is hardened and is difficult to plow. Sandstone is sandy and permeable. This soil is found in eastern Ilocos, south of Quezon, a portion of Bicol, Samar Masbate, Bohol and Surigao. Generally, this soil is good for rice, tobacco, corn and sugarcane but not as good as alluvial.

3. Limestone Soils. This soil is found in many parts of the country from Northern Luzon to Sulu. Most of the small islands are made of coralline limestone. This soil is rich in calcium. This soil is found in Batanes, Mountain Province, Rizal, Quezon, Masbate, Romblon, Samar, bohol, Cebu, Negros and Panay. Cultivated limestone soils are planted with corn, coconut, citrus, cassava and bananas. Limestone easily erodes, hence, this soil is better adopted for pasture lands and orchards rather than for farm crops.

4. Andesite and Basalt Soils. These are fine grained igneous rocks, which are derived from volcanic extrusion. These are found most in uplands like Mountain Province, Zambales, Bataan, Palawan, Bukidnon, Lanao and Basilan. Process of weathering is slow for this soil since basalt is a hard rock. Soil is generally shallow and of low fertility.
5. Mountain Soils. These are found in mountainous regions. This soil is not yet well-studied since it is difficult to access thick forests. This soil abounds in Cordillera, Sierra Madre. It cannot be utilized for farming purposes.

**Forests Resources**

**Forest Types**

1. Dipterocarp. This is a variety of the tropical rain forest and it grows well where rainfall is consistent and high. This forest produces much of lumber. Apitong, Yakal are examples of trees found in this forest.
2. Molave. This is common in the western part of the Philippines where there is a distinct wet and dry season. Principal varieties under this type are narra, ipil and molave. Lumber of these trees are highly valued for cabinet and furniture works.
3. Pine. This type occupies the mountain regions of Northern Luzon and Mindoro.
4. Mangrove. This type is found along the coastal area of the mouths of streams and on the shores of protected bays. Trees of this type are used for light construction, fuel and manufacture of charcoal. Nipa palm is the common type of tree found in this forest.
5. Beach. This is found in sandy beaches in many shores of the country. It is of little commercial value.
6. Mossy. This is a protected forest that helps conserve water resources and prevent soil erosion. It is found in high rugged mountains, which are quite inaccessible. It is a sanctuary for wild life.

**Philippine Geographic Regions**

A geographic region is an area in which there is some conspicuous unity in the expression of the natural and cultural setting. The essential unity may rest primarily upon landforms or a combination with climate, soils, vegetation and culture of the inhabitants. The sixteen regions of the Philippines are divided according to major island groups, landform and location of the provinces. The country is divided into: National Capital Region (NCR); Cordillera Administrative Region (CAR); Region I (Ilocos); Region 2 (Cagayan Valley); Region 3 (Central Luzon); Region 4a and 4b (Southern Tagalog); Region 5 (Bicol); Region 6 (Western Visayas); Region 7 (Central Visayas); Region 8 (Eastern Visayas); Region 9 (Western Mindanao); Region 10 (Northern Mindanao); Region 11 (Southern Mindanao); and Region 12 (Central Mindanao); Autonomous Region of Muslim Mindanao (ARMM); and the Region of Caraga.
DESCRIPTION OF THE GEOGRAPHIC REGIONS OF THE PHILIPPINES

National Capital Region (NCR)—Window to the World
*Location:* Along the flat, alluvial delta of the Pasig River (Luzon)
*Topography:* Sixty percent of the region is non-agricultural in nature.
*Climate:* NCR experiences two pronounced seasons; dry (January–May) and rainy (rest of the year)
*Economy:* The economy of the NCR is anchored in Manila, the country’s capital. NCR is the heart of the nation’s financial, commercial, industrial, political and cultural activities. Manila Bay is the country’s finest and busiest due to international and domestic trade.

Cordillera Administrative Region (CAR)—Home of the Igorots
*Location:* Landlocked administrative body in North-Central Luzon
*Topography:* The region is traversed on all sides by the Grand Cordillera Range, a mountainous chain, which rises abruptly from the sea at Cagayan and Ilocos Norte and runs towards Mt. Pulag in Benguet. Only a fraction is flat agricultural land. Cordillera is the watershed of Luzon, having a system of rivers that can provide irrigation and could generate energy.
*Climate:* Precipitation is extreme: there are 8-9 months of moderate-to-heavy rains everywhere. Temperatures can drop to almost freezing point, and frost is common.
*Economy:* CAR is a treasure house of precious and industrial minerals, including gold, silver and copper. Abra and Kalinga sit on large reserves of gold and copper. Agriculture remains as the region’s main livelihood. Benguet produces large quantity of vegetables and cut-flowers.

Ilocos Region—Tobacco Capital
*Location:* A land with a narrow coastal strip that stretches from Lingayen Gulf to Cape Boreador in the North. It faces the South China Sea in the west and Malaya range in the east
*Topography:* The region resembles a slim, elongated hook in the western rib of Luzon. The eastern part is hilly and mountainous; while the western part is a flatland stretching from the north down to the province of Pangasinan. The coasts lack good harbors and the shoreline is shallow and the bays are unprotected.
*Climate:* In general, warm weather prevails in most parts of the region, although it has rainy seasons.
*Economy:* Farming remains the principal livelihood. People are engaged in livestock and practice crop diversification. They are also into weaving and pottery. Tobacco is the major commercial crop. The region also boasts of its vast fishery resources and salt-industry.

Cagayan Valley—Where the Mighty River Flows
*Location:* It is at the northeastern portion of Luzon
*Topography:* Cagayan Valley has a depressed central portion where mountain streams flow directly into the Cagayan River, the longest river in the country. The region has over 890 kilometers of coastline and rich fishing grounds. About 50% of the regional land mass is agricultural. 40% is forestlands.
Introduction to Philippine Geography

Climate: It is relatively dry from November to April, and wet for the rest of the year, except for Batanes, which is practically wet the whole year round.

Economy: It produces rice, corn, and bulbs like garlic, onion and ginger. Tobacco is the major cash crop. Rattan basketry, which is endemic to Nueva Viscaya, is another profitable livelihood activity. The region also produces native soft brooms that are sold in NCR markets. Isabel used to be a leader in wood industry but it has declined over the years due to log ban in the region.

Central Luzon—Rice Granary of the Philippines

Location: This region lies midway the northern and southern tips of Luzon. West of the region is China Sea

Topography: It has a diverse topography. The agricultural plains are vast and fertile, planted mostly with rice. It has also virgin forests and mountains that yield precious ore and mineral resources. Its western portion features a coastal area that stretches from the Bataan Peninsula, to Pampanga and to Bulacan. Its active volcano, Mt. Pinatubo has changed the region’s landscape since it erupted in 1991.

Climate: The region has two pronounced seasons; dry (November-April) and rainy (May-October), except in Nueva Ecija, where it rains almost all year round.

Economy: It is one of the most progressive regions in the country. This progress may be partly attributed to the former U.S. military bases of Subic and Clark, which have been converted into free port investment sites. Bataan houses the country’s major export processing zones. Zambales is the major producer of chromite and other forest products. Nueva Ecija and Tarlac are the main rice producers. Pampanga and Tarlac are also a major producer of sugarcane. Fishpond culture also flourishes in Bulacan and Pampanga.

Southern Tagalog—The Philippines Premiere Region

Location: It is located along the southwestern portion of Luzon.

Topography: This region is the country’s largest region. Southern Tagalog has varied terrain—from rolling hills and valleys, to plains and mountain ranges. It is one of the most progressive regions in the country. It surrounded by large bodies of water.

Climate: Several coastal towns particularly those in Marinduque, Occidental Mindoro, Oriental Mindoro and Romblon are within the typhoon belt.

Economy: The region’ stepping stone to progress is the CALABARZON—Cavite, Laguna, Batangas, Rizal and Quezon for in this zone, some of the world’s industrial leaders have established their businesses in this area. Also, it attributes its development to its rich metallic and non-metallic mineral resources, like the 148-million metric ton marble reserves of Romblon. Palawa is also noted for its offshore oil deposits. It also boasts of its fresh water resources and fishing grounds.

Bicol Region—Land of the Volcanoes

Location: The peninsula forming the southeastern extremity of Luzon, with some other islands comprise the Bicol region.
Topography: Bicol’s irregular terrain ranges from slightly undulating hills to rolling mountains. It has many volcanoes, the most famous of which is Mt. Mayon. The region has also embayed coastal areas. Its natural harbors give refuge to ships during bad weather.

Climate: Three climate types exist in this region: the absence of dry season in the eastern coast facing the Pacific; long rainy season and very short dry season in the western coast and mainland Masbate; and an even distribution of rainfall throughout the rest of the region, disrupted only by typhoons.

Economy: Abaca is the region’s economic base. Bicol has also generated revenues from coconut growing, gold mining, and cottage industries. The region is developing its metallic and non-metallic mineral resources, which are ideal for finished and semi-processed industrial production. Bicolandia also pins its hopes on tourism industry.

Western Visayas—The Sugar Capital

Location: This region is a part of an island group that occupies the central past of the archipelago. It is bounded by Visayan Sea in the north, Sulu Sea in the west, Bohol Sea in the east, and Zamboanga Peninsula in the south.

Topography: The region’s terrain is dominated by a chain of mountains that extend from north to south of the Panay island. In the middle of this chain are low ridges that run northeast and divide the Panay island into three. The Guimaras is a coral-limestone island. Negros Occidental’s coastal area is rimmed with corral reefs and shoals and dotted by mangrove swamps, and rocky beaches. Numerous rivers and streams flow through the island.

Climate: Climate changes are extremely variable in Western Visayas, due to its precarious location in the monsoon belt. Areas exposed to northern and northeastern wind-flows receive more rain than the sheltered south-central areas.

Economy: In the 1970’s, Western Visayas was to be known as the country’s sugar capital. After surviving the economic crisis in 1984, the region is going full gear into agro-industrialization. It is also pursuing alternative industries like prawn farming, rice production, food processing and ethanol production. Among these, prawn culture is a top earner.

Central Visayas—The Perennial Trade Hub

Location: Central Visayas span on both sides the belt of the Philippine Archipelago, between the major Islands of Luzon and Mindanao. At the center is Cebu. The region is surrounded by the Bohol Strait and the Tañon Strait, which separate the island provinces from one another.

Topography: The region is characterized by interior highlands punctuated by narrow coastal strips of land suitable for cultivation. It has limited arable farmland but sufficient grazing land and some tracts of timberland. Bohol has the most unique topography: farmlands are concentrated in the central interior, which is a plateau.

Climate:

Economy: This region is one of the country’s most progressive regions mainly because of Cebu, a trade hub since the time of the Spaniards. This is due to the location of Cebu, which is at the center of the Philippines making it an ideal spot for commodity distribution by sea or air. It has more domestic air and sea linkages than Manila, enabling it to communicate with the rest of the archipelago. Several multi-national companies have been encouraged to base their operations in Cebu, especially in Mactan Export Processing Zone—the so-called “Ceboom”
phenomenon. Bohol and Negros Oriental’s assets are their rich farmlands, vast fishery resources and breathtaking scenic spots. Most of these islands are also exciting destinations for eco-tourism and sports events.

Eastern Visayas—The Gateway to Conquest and Freedom

Location: Samar and Leyte form the Eastern boundary of the Visayas. Bounding the region is Cebu in the west and the Pacific Ocean in the east.

Topography: The two islands differ in terrain. Leyte is rugged, with high mountain mass in the interior, while Samar is entirely covered by low rough hills. The mountains and hills are broken by valleys and coastal lands of various widths. Both islands have long, undulating coastlines. The region has many watersheds and numerous rivers. The whole region is vulnerable to seismic movement. It is traversed by the Philippine Fault Zone, which runs through the Philippine Deep. Leyte is more vulnerable to earthquakes because the tectonic line extends through its entire length. All coastal municipalities and barangays facing the Pacific Ocean are prone to tidal waves and tsunamis.

Climate: Frequent typhoons characterized the region. Both islands have coasts that are exposed to the Pacific Ocean. An average of seven typhoons pass the region annually. Weather is generally wet throughout the year, with heavy rainfall from December to January. Western Leyte has a short dry period from February to May.

Economy: Agriculture is the potential strength of Eastern Visayas. Its extensive farmlands are utilized for the production of major cash crops, like palay, coconut and sugar. It is also being targeted as an alternative source of rice and corn to supplement the losses of the lahar-ravaged Central Luzon. Mining is a stable source of income in this region. Leyte provides the region with its geothermal power that is said to be enough to supply the energy needs of Cebu and Luzon.

Western Mindanao—Land of the Badjaos

Location: Western Mindanao is in the northwest of the island of Mindanao. It is bounded by Negros in the north, Sulu Sea in the west and Lanao Provinces and Misamis Occidental in the east, and Mindanao Sea in the south.

Topography: This region is rough and mountainous. Zamboanga del Norte is mountainous in the northwest, while the coastal and central plains are cultivated farmlands. Zamboanga del Sur’s vast farmlands lie in the north. Basilan is less rugged in terms of topography.

Climate: The climate of the region is wet and dry. Zamboanga del Sur has short dry season and a long rainy season. Zamboanga del Norte and Basilan have an evenly distributed rainy season.

Economy: This region relies on agriculture to feed its two million people. The region has three of the most important fishing grounds in the entire country: Moro Gulf in Zamboanga del Sur; Sindangan Bay in Zamboanga del Norte; and Pilas Channel in Basilan, where fish like tuna, mackerel and sardines abound. The region is also a tourist destination.
Northern Mindanao—The Hinterland

Location: This region refers to the provinces in the northern portion of Mindanao.
Topography: The region has long coastline. It has several mountain ranges: Caballero and Mapoto mountain ranges; and Central Cordillera of Bukidnon. Calabugao Plateau and the Maapag Plains in Bukidnon and a chain of seven volcanoes in Camiguin Island complete the varied topography of the region. Northern Mindanao is cut by two seismic fault zones: one hits Camiguin and the other hits Cagayan de Oro City.
Climate: Eastern part of the region has a wet season and a short dry season. It is partly shielded from the northeast monsoon but is exposed to the tropical storms that usually accompany the southwest monsoon.
Economy: This region is promoted as a main gateway in Mindanao, via Cagayan de Oro City. The region’s rapid industrialization has been helped in some way by low-cost hydroelectric power that is indispensable for the processing of raw materials. The nucleus of the region’s progress, however, remains concentrated in its agricultural output. Bukidnon is a major producer of pineapple. Camiguin continues to astound tourist with its main cash crop, the lanzones. Its extensive fishing industry is also a key player in its development.

Southern Mindanao—Gateway to the South

Location: This region lies diagonally on the southern tip of Mindanao.
Topography: The region’s varied terrain consists mostly of mountain ranges, wide fertile valleys, plateaus and flatland. The Mount Apo range sprawls on the plains of Davao del Sur. It acts as a natural boundary between the province and South Cotabato. Fertile arable lands lies in the many huge fissures of this mountain chain. Practically, all kinds of crops are grown in these tracts of land.
Climate: The region is seldom visited by typhoons. The region is visited by a generous rainfall throughout the year. Heavier rains, however, are experienced in the eastern coast. The weather is usually cool and mild.
Economy: Agriculture and wood processing are two of the main industries of Southern Mindanao. Forested areas are fully developed for large scale logging operators. The region is at present is the biggest producer of lumber in the country. Grain processing is another major industry. Large quantities of export-quality fruits like pineapples, bananas and citrus are also produced in the region. Fishing is a major industry, especially in the coastal areas. Mineral resources like gold and copper are mined in Davao.

Central Mindanao—Realm of Mount Apo

Location: The region is in the southeastern section of Mindanao.
Topography: The region’s terrain consists of lands that are highly suitable for agricultural, urban, industrial and other related uses. There are hilly to mountainous areas that are classified as forest reserves. The area around Lake Lanao is rugged and broken by mountain ranges. The Cotabato floodplain is oartly swampy and overlain by alluvial deposits of clay, sand and gravel. It has four principal volcanoes: Mount Apo—boundary of Davao and Cotabato; Mt. Talomo, between Lanao del Norte and Cotabato; Mt. Blik, shared by Cotabato and Maguindanao; and Mt. Ragang in Cotabato and the most active of the four. A minor fault line cuts through Cotabato. The region is endowed with fresh water resources that supply its
irrigation for domestic and industrial use. Two of these rivers are being developed into sources of hydroelectric power and irrigation. These are Cotabato River and Agus River.

*Climate:* It has a dry and wet season. Its weather is generally mild throughout the year.

*Economy:* Although it remains an agricultural region, Central Mindanao has come to rely on its expanding industrial sector, especially in exports and investments. The region is a major exporter of rice, sugar, and copra. It also exports steel, garments, textile, furniture, and marine products. Lanao is the largest source of marine fish production.

**Caraga—The Newest Region in the Philippines**

*Location:* This region is made up of the provinces found in northernmost section of Mindanao. Its name is after the Visayan term “calag”, which means “soul” or “spirit”.

*Topography:* This region is located on one of the most geologically unstable zones in the world. Surigao is precariously perched on the edge of the Philippine Deep. The region has numerous river systems, which includes the mighty Agusan River, which waters and drains most of the region’s agricultural lands. Skirting this river are wetlands, which constitutes Caraga’s ecosystem. These wetlands harbor diverse species of flora and fauna.

*Climate:* Caraga’s location makes it vulnerable to the northeast monsoon, which usually accompanies typhoons. There is not a single dry month. Rain is more frequent in December and January.

*Economy:* This region boasts its cast natural resources that can be tapped for development. Surigao del Norte has the biggest deposit of nickel, gold, iron, sand and gravel in the region. Its waters also are teeming with marine life. The agricultural lands yield rice, coconut and root crops. Surigao del Sur prides itself for having the largest iron deposit in the world. The province is also rich in marine and forest resources. Agusan del Sur is noted for its palm oil plantation.

**Autonomous Region of Muslim Mindanao—The Enclave of the Muslims**

*Location:* ARMM is a dispersed region. Lanao del Sur and Maguindanao are located in the mainland, while Sulu and Tawi-Tawi are scattered south of the Zamboanga Peninsula.

*Topography:* The region has varied terrain, characterized by rolling planes, valleys, lakes, mountains and island-grouping. Sulu is practically covered by mountains, most of which are volcanic in origin.

*Climate:* The region has a short dry season. It is exposed to the northeast monsoon. Only Lanao has a temperate climate, which is cold and moderate.

*Economy:* ARMM is one of the poorest regions in the Philippines. Smuggling remains a traditional practice to this day, along with illegal fishing.