

The
PHILIPPINE GEOGRAPHICAL JOURNAL

VOL. XIII

APRIL-MAY-JUNE, 1969

NUMBER 2

**GEOGRAPHIC APPROACH TO PHILIPPINE
ECONOMIC DEVELOPMENT**

by

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Geographical Landscape. — The Philippines is composed of 7,000 islands and islets with an aggregate land area of 114,400 square miles (29,741,290 hectares); is between 21°25' and 4°23' North Latitude and 116°00' and 127°00' East Longitude. It extends 1,150 statute miles north and south and 660 statute miles east to west. Located in a most strategic position in the Pacific Ocean, the Philippines lies across the major sea lanes of commerce in this ocean. Within a radius of 2,500 miles from Manila, nearly a third of the population of the world exist. As it is today, the country is on the very cross-currents of two mighty economic and political ideologies — Communism and Democracy.

Natural Environment. — The natural environment of the country may be grouped into three, namely: climate, topography or relief and earth resources.

The Climate. — The climate is essentially humid and tropical without very great ranges in specific characteristics. The primary climate variations center on elevation. Temperature throughout the country is generally between 77°F and 82°F mean annual temperature (except in Mountain Province with 64°F). Rainfall differences throughout the country are decidedly variant, the very reason why classification of Philippine climate is based on rainfall — namely the wet and the dry months. (wet in summer and autumn months and dry in winter and spring months). Four types of climates on the basis of rainfall have been established namely:

Type I — two pronounced seasons, dry from November to April and wet during the rest of the year.

Type II — no dry season; with very pronounced maximum rainfall period from November to January.

Type III — or Intermediate type A, no very pronounced maximum rain period with a short dry season lasting from one to three months.

Type IV — or Intermediate type B, no very pronounced maximum rain period and no dry season.

The type IV of climate is the most ideal. Rainfall is more or less evenly distributed throughout the year. Above all the climate

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of the country has endowed upon the people twelve months of growing season during the year. Even during the dry season we can grow some dry season crops. The mean annual rainfall ranges from 77.25 inches (197.24 cm.) in Cagayan Valley (Northern Luzon) to 128.08 inches (315.32 cm.) in the Bicol region (Southern Luzon).

Relief or Topography. — The Philippines is characterized by a great variety of relief forms. Mountains, hills, plains, valleys, and plateaus are found nearly in all the larger islands. The mountains vary greatly in height and ruggedness from island to island. They consist either of intricate ranges and ridges, isolated volcanoes, or chains of volcanic cones. The highest mountain is Mount Apo (9,640 ft.) in Mindanao Island. These relief features have much effect on local climate.

Between some of the mountain ranges in the large islands are fertile level valleys making the land well adapted to the growing of crops. Also in the medium and higher elevations are found areas especially suited to particular crops. The more important agricultural regions are the coastal plains of Ilocos, the Central Plain of Luzon, the Bicol region, the Central plain of Panay, the western plain of Negros, the northern plain of Leyte and the Agusan and Cotabato areas in Mindanao.

The Philippines has an irregular coastline that stretches over 10,850 statute miles. It has over 60 natural harbors, 20 land-locked straits and hundreds of rivers, bays, and lakes.

The Earth Resources. — Considered elements of the natural environment are land and soil, water, natural flora and fauna and minerals. The land and soil cover almost 30 million hectares and has been classified into land-use pattern such as commercial forest, non-commercial forest, openland grass and brushland, marsh and mangrove swamps, and cultivated lands. Land and soil is the prime and basic environmental factor that affects greatly the activities of man.

Water in the sea, lakes, and rivers constitute large portion of the environmental landscape of the country. The natural flora abounds luxuriantly as well as the natural fauna both in land and sea. Fish in Philippine waters is considered most abundant compared to other parts of the world.

The mineral resources of the Philippines is considered one of the richest in the world. Gold and silver are barely tapped while nickel and chromium considered largest in the globe are not yet exploited. The principal nickel-bearing deposits are in Surigao, Zamboanga, and Leyte with an approximate total volume of metal ore reserves of 152,122,000 metric tons. Copper is next in quantity which is estimated in the amount of 133,659,000 metric tons. Gold and silver that have been mined since Spanish time still have approximately 133,010,000 metric tons of metal ore reserves.

POPULATION PATTERNS

The Republic of the Philippines as of July 1, 1965, has reached the population mark of 32,345,000 people. The first four regions leading in terms of population are Southern Luzon 5,063,000 (15.7%), Eastern Visayas 4,724,000 (14.61%), Western Visayas 4,541,000 (14.1%),

and Southern Mindanao 3,918,000 (121%). These centers of population growth have also increased correspondingly the manufacturing industries to provide the people with the basic needs of food, clothing, and shelter (1).

During the year ending 1964 it has been estimated that a Filipino is born every 33 seconds. It may be estimated safely that today (1968) two may be born every 60 seconds. On the basis of these data our yearly increase in population is about 1,041,200 a year — an increase in population of more or less 3.2 percent.

In the 1960 census sex distribution showed 101.8 males for every 100 females. Starting with 106.1 for the age group under 5 it began to decline significantly at the age group of 15 to 19. This may be attributed to the higher mortality rate for males. At the age group of 45 to 49, men again outnumbered women and continued to be so up to 64 years. At 65 or over, females outnumbered males, the sex ratio being 99.7 males for 100 females (2).

The Filipino Food Requirements. — Results of the nutrition survey of the Food and Nutrition Research Center of the National Institute of Science and Technology showed very interesting facts (Table 1). Dra. Carmen Ll. Intengan, Assistant Research Director of the Center, said "Except for the Cereals and other fruits and vegetables all other food groups are taken in amounts below sufficiency. The prevailing mal-nourishment can be explained by the low intake of protective food. Compared to recommended allowances, only 2/3 of the meat, fish and poultry, 1/3 of the egg, 1/7 of milk, 2/5 of beans, 1/4 of leafy and yellow vegetables and 1/3 of vitamin C-rich foods are included in our diet. Undernourishment, which poses a bigger problem, is attributed not only to the inadequacy of protective foods but more to the low intake of energy foods like starchy roots (4/5) sugar (1/2) and fats (1/4). From food consumed, the corresponding nutrients (shown in Table 1) indicate that foremost among the deficiencies is calories. The per capita calorie intake is only 76 percent of the requirement. Protein is short by 15 percent of recommended dietary allowance and with a low intake of energy-producing food, the nitrogen can not be efficiently utilized."

Dr. Intengan further stated, "In the light of these findings, one can readily predict the nutritional status of Filipinos. The best indication we have at the present time of existing nutritional deficiency is the poor growth and development of our children" (2).

NATURAL RESOURCES

Distribution and Status. — The natural resources of the country in the forms of land and soil, water, forest and grassland, fish resource, game and wild birds, and minerals abound throughout the country. These are the material things upon which man depend for his livelihood and well-being. Spread out in more than 7,000 islands no actual count has been made to ascertain the amount and value of these resources. At the time of American occupation when the population was just about 10 million people these natural resources were taken for granted.

"Today as the Philippines is in the process of maturing a new

phase of culture, its economic aspects characterized by increased agricultural production, increased international trade and industrialization, and the growth of industrialization. With the further growth of this pattern of economic culture will come many new problems never faced in time past. With this new economic culture must come new concepts, not only as technical skills and commercial practices but as philosophic viewpoints. Industrialization, particularly, is an attractive concept to the contemporary Filipino in almost every walk of life, and much is hoped for as it develops. Industrialization has raw material requirements beyond those of previous culture pattern, and beyond the fuel and mineral resources that one ordinarily thinks of. A chief raw material of industrialization is the agricultural output of a country, for almost every kind of crop feeds some of its yield volume into machines for processing in some way. Another is the yield of fresh water available and a third is the supply of woody materials. As industrialization proceeds, larger and larger volume of crops, water, and wood are devoured by the industrial machines and consumed by a population living in new ways. It requires the rethinking of numerous old patterns of thought to integrate these old-fashioned elements of a landscape into the new concepts of maturing industrialization of a new sort" (4).

Land and Soil Resources. — Generally our land and soil resources can be roughly estimated at 30 million hectares. Cultivable area within the range of agricultural feasibility is also roughly estimated at 30 percent of the total area. Recent estimates, however, showed that about 37.73 percent have been under cultivation to food and commercial crops or in the total area of 11,317,797.00 hectares (See Table 2). This figure, however, varies from year to year. The fact is that the demand for more land to produce the basic needs in the form of food, clothing, and shelter of the ever expanding population is of first priority.

The soil resources of the country while they are basically fertile and amendable to conservation measures and practices have not as yet received from proper authorities concerned the much needed attention that these resources deserve. The soil survey work that has been done since 1935 to classify the soils, estimate the damages and extent of erosions, and the depletion of fertility of our heavily cropped soil regions has barely covered the situation. What have been done in soil and erosion surveys during the first few years before and after World War II need updating to conform with the new trend of highly exhaustive and damaging soil utilization in this country.

Soil fertility survey has been made with the assistance of the United Nations Development Program. The program is nearing completion after five years of successful work on soils of the country regarding plant food requirements of various soil types under the four climatic types of the Philippines. Recommendations are being prepared. It is the hope that with these results fertilizer recommendations will give the country proper perspective as to the fertilizer requirement of Philippine soils.

Forest Resources. — For a long time the Philippines is well-known to have one of the finest forest resources in the world. These are mostly of the tropical rain forest type characterized by a multiplicity

of vegetation and a wealth of timber species some of which yield woods comparable to the best in the world. From these forests come the Philippine Mahogany timber well known in the world trade and the fancy woods like narra, tindalo, dao, and kamagong. During the last fifty years, however, destructive logging practices have gone so far that much of the remaining tracks of good forest land are now found in the more rugged interior of the country. Thus, in many regions even steep lands have been exposed to accelerated erosions and many water sheds are destitute of protective tree vegetations. Consequently, we hear now of flash floods during the rainy months and often times many places experienced scarcity of water during the dry months. In this period of dry months, interruption and failures of hydro-electric plants and water works usually occur.

The Bureau of Forestry, Department of Agriculture and Natural Resources, has a continuing function of land classification ever since it was organized in 1863 during the Spanish time and under the U.S.A. in 1904. However, it did not receive the much needed attention until 1952.

Pending the completion of the forest resources inventory for the whole Philippines being undertaken by the Bureau of Forestry, the figures on the vegetative cover for the period from July 1, 1965 to June 30, 1966 is indicated in Table 2.

The average timber stored in a commercial forest is 96.57 cubic meter to a hectare, although there are many exceptionally good forests with 250 cubic meters per hectare. Over all timber stock is estimated at 900 million cubic meters (382 billion board feet) with potential market value of P30.5 billion with (1 US dollar = 3.89 pesos), Mindanao the Island in the south has 48 percent of the stock, Luzon 29 percent, Palawan 7 percent and the rest in the remaining islands.

Range Resources. — Forage grasses and legumes which are both nutritive and palatable to livestock grow luxuriantly throughout the country. In places where rainfall is evenly distributed these fodder plants grow throughout the year. Considering that there are about 5.5 million hectares of grassland scattered all over the Philippines, some in extensive areas, others in small patches, these potential grassland resources can support a substantial livestock industry.

Mineral Resources. — Our mineral asset is barely touched. Of the total land area only about 5.5 million hectares or 18.6 percent have been covered by mineral and geological surveys, 1.5 million hectares or about 5 percent of which have been located and applied for mineral development and about 15,000 hectares are under development and exploration. The potentials for development of a large and progressive mining industry in the country is vast.

Water Resources. — It has been stated from time to time that the Philippines has plenty of water resources. This is based on the fact that we have high rainfall, our rivers are numerous and lakes and springs are found in most of the islands. Lahoz has made four basic categories under which water resources in the Philippines can be used in Industry: (1) Rainfall, (2) Running surface water, such

as river and streams, (3) Ground water, and (4) Water at rest as it occurs in lakes and seas (5).

Rainfall is so ordinary and common place that many people do not realize the value. The Philippines' Weather Bureau has sufficient data on rainfall of the country (6). However there is urgent need of more rainfall stations in basically agricultural areas and also in areas potentially feasible for agricultural development in order to provide planners and technologists an accurate knowledge of the rainfall pattern.

Flowing surface water as a natural resource is better appreciated than rainfall by the people. From time immemorial farmers have led the waters from the creek and rivers into the farmers' land to irrigate their crops. But as the needs of this water become widespread water supply becomes limited. It is at this stage that there is an urgent need for studies and surveys of our water resources to answer the needs of growing population for water use.

In order to comprehend the importance of water to our economy the following priority use can be categorized as follows: (1) Domestic use including farm and stock use, (2) Municipal use, (3) Irrigation use, (4) Industrial use, (5) Waterpower use, and (6) Recreational use.

While our irrigation systems are being expanded to cover additional areas for crop production especially rice, there is almost equivalent need for water in industry to process several items for food and other goods in the expanding industrial plants in centers of population. Likewise hydro-electric power plants producing vital electric power to our industrial factories need as much water as to maintain its full working capacity. Water resources therefore is so important to our growing economy that we have to look at the subject closely and seriously, if we want to continue living at our present standard of living.

Fishery Resources. — Our fishery resources abound in about 900,000 hectares of fresh water, about 500,000 hectares of brackish swamplands, and 166,630,000 hectares of marine area. In these waters are 2,100 species of fish although about a hundred are of commercial importance. Other aquatic products are crustaceans, shellfishes, corals, sponges, and other invertebrate animals.

Our fresh water resources are now being considered as potential sources of protein food to the extent that new species of fishes found favorable in these areas are being stocked. The brackish swamplands that offer vast economic potentials for culturing fishes and other aquatic products are being looked into by proper authorities for financial assistance by the Development Bank of the Philippines and the Philippine National Bank. Likewise the marine fishery resources in coastal waters along a shoreline of 17,460 kilometers and deep-sea and offshore areas offer vast possibilities for development. Our offshore waters and the adjacent high seas are the seat of tuna and tuna-like species which are highly desired in the world market.

FOOD PROBLEM AND OUR NATURAL ENVIRONMENT

Baron (7) said "On given morning this month 1,100 million human

beings will rise to face a future in which the whole of their lives will be dominated by a single word: Rice. They are the rice-eating peoples of the world, spread through monsoon areas of Asia and elsewhere, for whom rice means practically the whole of their diet, nearly all their agriculture and much of their hopes." The Philippines and its people of 35 million is within this area and covered by this observation.

"Economic growth and productivity in the Philippines nowadays are definitely not sufficient to fill the basic needs of our people when viewed against the rate of population growth, which ranges from 3.23 to 4 percent annually, an increase of more than one million persons every year. The present per capita food supply in the country according to a study undertaken by the National Economic Council, amounts to 989.2 grams per day or 361 kilos per year. The Philippine public today subsist on cereal diet with 78.0 percent milled rice, 18.5 percent milled corn, and 6.5 percent wheat flour. The National Economic Council has estimated that the total food supply is about 85.4 percent adequate (8).

The above statements and many other similar observations indicate the picture of the food problems in the Philippines today. The fact is — whatever economy this country will pursue we cannot escape the fact that we are rice-eating people and our daily lives from morning till the next morning of the 365 days of the year depend on this staple food, rice. It is therefore basic that our agricultural economy must always center in the sufficiency of this crop. When this aspect of our food problems is solved the rest of the basic recommended dietary allowances will find their way to easy solution. This problem of foods, however, cannot be achieved successfully and sustained throughout the years that will follow unless our attitude towards our natural resources and their conservation is re-examined, evaluated according to present needs of our population trends and rising standards of living. We realized that we have to live in harmony with our natural environment and keep our natural resources properly and wisely utilized.

PROGRAM FOR DEVELOPMENT — GEOGRAPHIC APPROACH

Program of development of the economy of a country follows basically the recognition of the natural environment and the existing natural resources of the said country. Resource geography or simple resource management is the basic procedure. Human population is used as the starting point in resources management. Natural resources are evaluated on the basis of how many people will be fed, clothed, and sheltered, their standard of living maintained or increased.

In the Philippines consider 3,000 people increase every day. Every day, therefore, there will be 3,000 more people needing water, 3,000 more people needing food and clothing — all of these requirements will be deducted from our natural resources every day. Imagine therefore the tremendous drain in our stock of foods, clothing and shelter — all of these to come from our natural resources. How much of these will be left if we keep on withdrawing our supply without an ade-

quate program of replenishment of these supplies.

Soil Resources. — Consider the soil as a bank where mother nature has deposited sufficient plant nutrients to produce the crops needed for our subsistence. Every time the farmer harvests his rice crop to about 45 cavans per hectare, about 150 kilograms of plant food constituents in the form of nitrogen, phosphorus (P_2O_5), and potassium (K_2O) are removed from the soil. In the case of corn which removed more nutrients than rice, the amount is about 246 kilograms of N P K nutrients for an average yield per hectare. Unless we realize these facts and learn to maintain the soil fertility until it is too late, we will find ourselves like a man who has overdrawn his bank deposits and get a return check marked **No Funds**.

Management of soil resources require exact and scientific methods of approach. Soil surveys of our soil is basic first step, followed by land use survey, fertility survey, and many other surveys. All these surveys provide basic data in the conservation of the soil resources. In addition, data so obtained can be utilized in several other programs of economic development. Economist of high caliber finds soil geography very important tool in economic planning and development. Program of settlement of people from thickly populated areas to sparsely populated region is a question of where and how much such area can absorb and carry a certain number of people.

Soil resource is a renewable resource. Only by way of conservation measures can we renew eroded and depleted soils. Soil technologist, soil chemist, soil engineer, hydrologist, soil bio-chemist and a host of other technologists have to work together to make our soil productive at all times. In brief, there must be substantial number of trained personnel in the government agencies who can continuously work on the physical, chemical, and biological studies of our soil. Such data must be always available to our economic planners and economic geographers.

Water Resources. — Generally, many people have taken water for granted. "How many of them know what water is about?" asked Dr. William E. Warne, Director of the California Department of Water Resources. "Not one in a million." Yet the people who use water, who pay taxes, and vote on the bond issues for water development and conservation, must make the political and economic commitments that will ensure a steady flow of water. Though it may be considered a gift of God, water must be properly harnessed and husbanded by the people" (9).

The Philippines is blessed with abundant rainfall throughout the year. At one time we have too much, so much that it destroys life and property. Then comes a season where we do not have enough, and this also destroys our farm crops and farm animals. *What is the real problem in water utilization?* There is an urgent need for research and development studies in this country on this important resource (10).

Let us consider the watershed approach to our water problem.

Watershed is usually the area within the drainage system which catches and accepts the rainfall during the year, absorb, deposit, and then release in a relatively even flow as underground water, springs, streams, and rivers. An ideal watershed must be one that has abundant vegetation that helps create a sponge-like absorbent soil and substantial vegetative protection from excessive evaporation. When the vegetation of the watershed is removed or cleared by an excessive and careless logging operation, the watershed value of the area is lost. It is just like destroying the effectivity and holding capacity of the water reservoir.

A good example of the destruction of water shed in the Philippines is well illustrated in the Mountain Provinces where the Ambuklao Dam, the site of the hydro-electric power plant for a large part of Luzon including about one third of Manila's electric current requirement. The watershed for this dam is a system of steep slopes and deep canyons ranging from Mt. Data at the crest of the mountain range along the Agno River to the dam. The Ambuklao watershed was formerly largely covered with good vegetative cover with forest of open pine and oak. Presently, there is wanton destruction of forest cover by uncontrolled *Kaingin* system (shifting agriculture) of farming,¹¹ squatting, burning and over-grazing throughout the area. "According to an FAO water management expert, who has studied the area during the past year, because of this land abuse the rate of siltation in the Ambuklao Dam reservoir has increased 400 percent in the 10 years since the dam was constructed. As a result, if the destruction is not stopped the effective life of the reservoir and its hydro-electric production will be less than half of the 62 years estimated when the dam was built." Watershed can be considered renewable resource. It is essential that water be conserved for water is the life of the people, of their land, and of their industry (12).

Concentrated efforts of hydrologist, climatologist, soil technologist, forester, and logger must be made to study the problem of watershed to the benefit of all the people concerned. The young in grade schools must be educated in the conservation of natural resources — and the people who are actually in resource utilization must be rational in their actuation for the benefit of the country in general and for the maintenance of optimum productive capacity of the nation. Fly-by-night operators who amassed millions today and do not care what happens tomorrow must be stopped. Destruction of our watershed is due mainly to the people who have no regard for the future condition of our forest lands that are not for normal agricultural operation.

Forest Resources. — The forest resources is one of the most important resources of the nation. Not only does it provides wood for shelter and fiber for the people, but it is also the indicator and regulator of our water resources. The forest products rank third in value among the country's recorded export items. So many people have risen from rags to riches in logging industry. It is but logical that these people should not kill the goose that lay the golden egg.

TABLE I. QUANTITY AND NUTRITIVE VALUE OF FOOD CONSUMED PER CAPITA PER DAY IN THE PHILIPPINES COMPARED TO RECOMMENDED ALLOWANCES.

| FOODSTUFFS: | Per Capita Food Intake <i>grams</i> | Recommended Allowances <i>grams</i> | Sufficiency <i>percent</i> |
|-----------------------------|---|---|-------------------------------|
| Cereal | 334 | 318 | 105.0 |
| Starchy Roots | 55 | 70 | 78.6 |
| Sugar | 19 | 33 | 57.6 |
| Pulses and Nuts | 8 | 20 | 40.0 |
| Leafy and Yellow Vegetables | 17 | 63 | 25.0 |
| Vitamin C-Rich Foods | 26 | 87 | 29.9 |
| Other Fruits and Vegetables | 93 | 94 | 98.9 |
| Meat, Fish, and Poultry | 75 | 108 | 69.4 |
| Eggs | 5 | 14 | 35.7 |
| Milk and Milk Products | 26 | 168 | 15.5 |
| Fats and Oils | 7 | 29 | 24.1 |
| NUTRIENTS: | | | |
| Calories | 1672 | 2193 | 76.2 |
| Total Protein, gm. | 47 | 54 | 85.7 |
| Fats, gm. | 21 | — | — |
| Calcium, mg. | 350 | 1000 | 35.0 |
| Iron, mg. | 10 | 8 | 125.0 |
| Vitamin A Value, I.U. | 1900 | 3772 | 50.4 |
| Thiamine, mg. | 0.8 | 1.2 | 67.2 |
| Riboflavin, mg. | 0.5 | 1.4 | 38.2 |
| Niacin, mg. | 14 | 12 | 116.7 |
| Ascorbic Acid, mg. | 70 | 70 | 100.0 |

TABLE II. VEGETATIVE COVER OF THE PHILIPPINES

| | <i>Area in Hectares</i> | <i>Percent</i> |
|---|-------------------------|----------------|
| 1. Commercial Forest | 11,752,056 has. | 39.17% |
| 2. Non-Commercial Forest | 2,851,383 " | 9.50% |
| 3. Cogon or open lands including Brush lands | 3,416,117 " | 11.39% |
| 4. Swamps & Marsh lands | 661,447 " | 2.21% |
| 5. Cultivated & other lands | 11,517,797 " | 37.73% |
| | <hr/> 30,000,000 | <hr/> 100.00% |

It is known throughout the world that Philippine forest is one of the finest in the world, the growth rate of which is among the highest ever known. Under proper management, reproduction of the forest resources is easy and rapid. It is on this fact that we consider our geographic approach to development of this important resource to be through good and efficient resource management.

The Bureau of Forestry, the Reforestation Administration, and Parks and Wildlife Office, of the Department of Agriculture and Natural Re-

sources must harmoniously work together following one pattern of program towards conservation. The College of Forestry of the University of the Philippines and the Forest Products Research Institute of the Office of the President all in Los Baños are two important agencies building respectively technical manpower in forestry education and wise utilization of forest products. With these governmental agencies working together complementary to each other our once unlimited forest resources now dwindling to exhaustion if not to total extinction can be renewed to provide our expanding population ample wood and water.

Other Renewable Resources. — Other renewable resources such as grasslands, wildlife, fishery resources follow the same pattern of destruction similar to soils, water, and forest resources. Conservation and geographic approach to their development are best expressed in the basic principle of understanding in relation with natural environment and the activities of man.

SUMMARY AND RECOMMENDATIONS

Conservation Education. — The most important need of the country today is the recognition by our people of the importance of our natural environment and its relation to natural resources. This must be brought to the public and private schools from the grade school levels to the highest institution of learning.

Natural Resources. — Conservation of natural resources must be a required subject to be taught in schools, colleges, and universities. Students in Education, Business Administration, Law, and Liberal Arts Science and Humanities should be given this subject as fundamental subject in their course of studies.

National Resources Inventory. — To be knowledgeable on our natural resources and their necessary conservation, there must be a government agency with full powers and authority to do these jobs. This can be either the National Resources Board, National Resources Authority or National Resources Conservation Board. In order that this organization could be effective it should have:

- (a) A full time chairman or director and vice - chairman or assistant director who are knowledgeable in any of the subjects of natural resources. They must be free from political influence.
- (b) Membership to the organization must come from all government resource - use agencies including the judiciary and law enforcement agencies.
- (c) Must also include important elements of the private industry especially those concerned with natural resources utilization like the wood industry, fishing industry, and mining industry.
- (d) The board must be responsible only to the President. It must, therefore, get the full budgetary support of the Office of the President.

Training of Personnel in the Conservation of Natural Resources. — Technical manpower is basic need of any organization, especially in a country with a developing economy. Engineers who think that hydrologic cycle can be controlled by dams and levees should be sent to countries like Japan where the watersheds are cared for like precious gems. Fundamentals of the science of climatology, pedology, geology, oceanography and other basic earth sciences must be learned by the personnel of this organization.

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The first responsibility of leadership is to gain mastery over events, and to shape the future in the image of our hopes.

— Richard M. Nixon