REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES
BUREAU OF SOILS
MANILA

Soil Report 45

SOIL SURVEY OF ROMBLON PROVINCE PHILIPPINES

Reconnaisance Soil Survey and Soil Erosion Survey

BY

DEMETRIO M. CASTILLO
Chief of Party

ISABELO QUIRO AND HIGINO MARCELLA
Members

MANILA
GOVERNMENT PRINTING OFFICE
1971

SOIL SURVEY OF ROMBLON PROVINCE[1]

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[1] Report updated and edited by Mrs. Magdalena Q. Favis, Soil Technologist II, Technical Specialist Section, Soils Survey Division, Bureau of Soils, Manila.

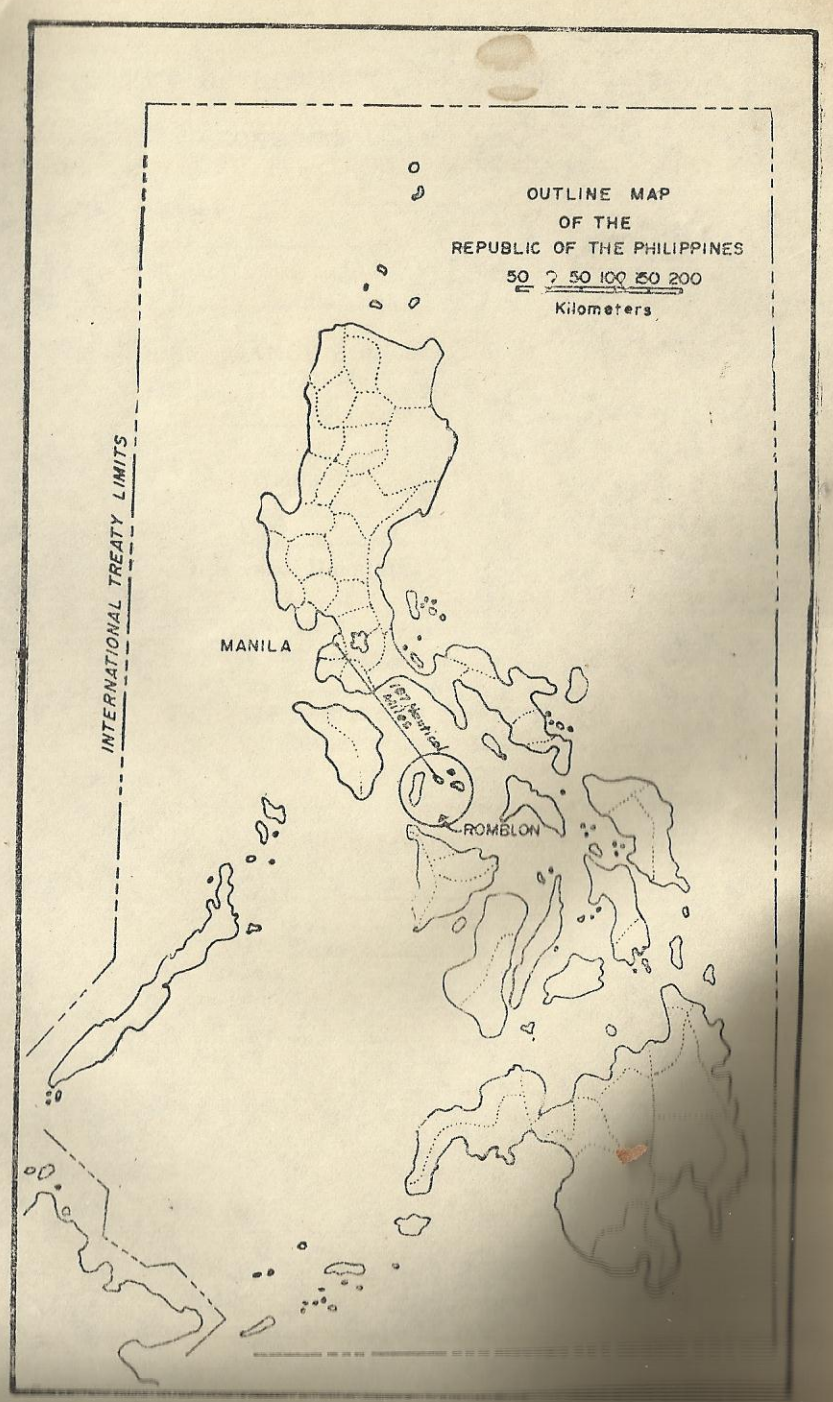

Fig. 1. Outline map of the Philippines showing the location of Romblon Province

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DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

HON. ARTURO R. TANCO, JR.
Secretary

HON. JOSE D. DRILON, JR.
Undersecretary

BUREAU OF SOILS

JUAN A. MARIANO
Director

HOW TO USE THE SOIL SURVEY REPORT

Soil Surveys provide basic data for the formulation of land-use programs. This report and the accompanying map present information both general and specific about soils, the crops, and the agriculture of the area surveyed. The individual reader may be interested in the whole report or only in some particular part thereof. Ordinarily, he will be able to obtain the information he needs without reading the whole report. Prepared for both general and detailed use, the report is designed to meet the needs of a wide variety of readers under three general groups: (1) those interested in the area as a whole; (2) those interested in specific parts of it; and (3) students and teachers of soil science and related agricultural subjects. An attempt has been made to meet the needs of all three groups by making the report comprehensive for purposes of reference.

Readers interested in the area as a whole include those concerned with general land-use planning—the placement and development of highways, power lines, urban sites, industries, community cooperatives, resettlement projects, and areas for forest and wildlife management and for recreation. The following sections are intended for such users: (1) Description of the area, in which physiography, relief, drainage, vegetation, climate, water supply, history, population, industries, transportation, markets, and cultural developments are discussed; (2) Agriculture, in which a brief history of farming is given with a description of the present agriculture; (3) Productivity Ratings, in which are discussed and presented the productivity ratings of the different soils; (4) Land Use and Soil Management, and Land Capability Classification in which the present uses of the soils are described, their management requirements discussed and suggestions made for improvement; and (5) Water Control on the Land, in which problems pertaining to drainage and control of runoff are treated.

Readers interested chiefly in specific areas such as particular locality, farm, or field, include farmers, agricultural technicians interested in planning operations in communities or on individual farms, and real estate agents, land appraisers, pro-

spective purchasers and tenants, and farm loan agencies. These readers should (1) locate on the map the tract concerned; (2) identify the soils on the tract by referring to the legend on the margin of the map and looking at the symbols and colors that represent them; and (3) locate in the text under the chapter on soils the descriptions of each soil type and additional information on its suitability for use and its relation to crops and agriculture. They will also find useful specific information relating to the soils in the sections or chapters on Productivity Ratings, Land-Use and Soil Management, Land Capability Classification, and Water Control on the Land.

Students and teachers of soil science and allied subjects, including crop production, animal husbandry, economics, rural sociology, geography, and geology, will find useful information in the chapters on Soils and Agriculture, where the general scheme of classification of soils of the province and a detailed discussion of each type are presented. For those not familiar with classification and mapping of soils, these subjects are discussed under Soil Survey Methods and Definitions and Mechanical Analysis. Teachers of other subjects will find the sections on Description of the Area, Agriculture, Productivity Ratings and the first part of the chapter on Soils of particular value in determining the relation between their special subjects and the soils of the area.

—ADAPTED FROM THE U.S.D.A.

ILLUSTRATION

INTRODUCTION

Romblon Island Group is an agricultural province whose terrain is generally rolling to hilly and mountainous. The level areas consist mostly of coastal plain and beaches, narrow valleys and patches of flat lowlands. Its population which increases rapidly year after year, derived their basic necessities such as food, clothing and shelter, from the soil resources. Most farmers have extended cultivation on steep slopes and mountainsides seemingly unaware of the destruction on the land brought about by erosion.

In order to have a good framework for a sound soil management and conservation program, a study of the physical, chemical, and morphological characteristics of the soil is important. It provides valuable data and information to farmers and other users of a particular area. With this end in view, a reconnaissance soil classification and erosion survey of Romblon Province was conducted from May 17, 1965 to July 28, 1965 and April 24, 1966 to August 10, 1966 by Messrs. Demetrio Castillo, Isabelo Quiro and Higino Marcella of the Bureau of Soils, during the incumbency of Mr. Artemio E. Gesmundo, Assistant Director and Officer-in-charge and of Hon. Jose Y. Feliciano as Secretary of Agriculture and Natural Resources.

SUMMARY

Romblon Province is composed of several islands, namely, Tablas, Sibuyan, Romblon, Banton, Simara, Carabao, Maestre de Campo and a number of small islets. The province as a whole lies within 12° and 13° latitude and between 121° 40′ and 122° 45′ longitude. Romblon, the capital of the province is approximately 187 nautical miles south of Manila. It has a total area of 135,593 hectares.

The relief of the province ranges from coastal plain to rolling, hilly and mountainous. The highest peak is Mt. Guitinguitin which is about 2,052 meters above sea level. There are numerous rivers and creeks that serve as natural drainageways. The largest are Odiongan and Looc Rivers in Tablas; Sablayan River in Romblon; and Cantingas, Punog, Olango, Cambajao, and Pato-o Rivers in Sibuyan.

The vegetative cover of the province consists of four types, namely; forest, grasses and shrubs, swamps and marshes, and cultivated crops. According to the 1946 census, the province has 28,058 hectares of communal forest or 21.14 per cent of the total soil cover; 32,390 hectares or 24.41 per cent are noncommercial forest; 71,656 hectares or 54 per cent are open land and cultivated field; and 600 hectares or 0.45 per cent are swamps and marshes.

The province was named after one of its island, Romblon where the seat of provincial government is presently located. Few authentic records can be dug up to show where the province derived its name. During Loarca's visit to the Philippines in 1582, he made mention of the islands of Lomlon or Donblon (Romblon), Banton, Simara, and Osingan (Tablas). The islands comprising Romblon were administered by the Secular Clergy during the Spanish era. In 1818, Romblon was incorporated into the province of Capiz. In 1898, Colonel Riego de Dios ruled the islands-scattered province. On March 16, 1901, American Civil Government was established in the province. It became a sub-province of Capiz in 1907. In 1918, it was organized into a regular province.

In the 1948 census, the population of the province was 108,817. In the 1960 census, there was a population of

131,658, having an increase of 22,841 or 17.34 per cent for a period of 12 years.

Practically all towns and some barrios are connected with good roads. In 1966, the local Highway District Engineer's Office has a record of 228.41 kilometers of national road and 256.01 kilometers of provincial road for the three islands of Tablas, Sibuyan and Romblon. Out of the above figures, 111.72 kilometers are first class road; 276.05 kilometers as second class road; and 96.65 kilometers as third class road. Inter-island vessels connect the province to Manila and Panay Islands. The shipping companies that serve the province are the Philippine Steam Navigation Company and the Filipinas Pioneer Lines, Inc. There are a number of motor boats that serve cargo and passengers between Carmen and San Agustin in Tablas Island to Romblon and to Magdiwang and Cajidiocan in Sibuyan Island. The trips of these motorboats are not regular.

Air service from the province to Manila and Panay Islands or vice-versa, is facilitated at Tugdan Airport, Tablas Island. The Philippine Air Lines, Inc. serve Tugdan Airport three times a week. While Air Manila has a daily flight schedule between Tugdan Airport and Manila and Panay Islands.

Practically all municipality has a market where farm products are being sold. Marketing of farm products from one island to another is not commonly practiced because of the inconvenience of transporting them.

All towns and some barrios are provided with a good water supply for domestic use. There are a number of natural springs which serve as sources of water. Some barrios not reached by these water systems are provided with pumps and artesian wells.

Romblon Island Group is made up of a wide variety of igneous, sedimentary, and metamorphic rocks ranging from pre-Tertiary to Quaternary in geologic age. Pre-Tertiary rock units consist of schist, marble, altered volcanic rocks and ultramafic rocks, the bulk of which are found in Sibuyan, Romblon and Tablas. In Romblon, the rocks are closely associated with marble. Marble occurs either interbedded with or overlying the various crystalline schist and covers about two-fifth of Romblon Islands and the adjacent islands of Alad, Cobrador, and Logbung. Deposition of Tertiary limestone and clastic

sedimentary rocks has its greater development in Tablas and Carabao Islands.

All towns and some big barrios are provided with complete elementary schools. There are also a number of public and private high schools in the province. An agricultural high school known as RONAS is located in Odiongan. There is also a fishery high school in Cabolutan, San Agustin offering academic subjects.

Aside from a number of puericulture centers, the province is provided with four hospitals. Two of these hospitals are in Tablas, the Romblon Provincial Hospital in Odiongan and the Tablas Emergency Hospital in San Agustin. In the capital town of Romblon is the Romblon General Hospital. The Sibuyan Emergency Hospital is located in Cajidiocan, Sibuyan Island.

Catholic is the religion of majority of the people in the province. There are other religious sects but with very limited followers.

Agriculture is the number one industry of the people in the province. Next to farming is fishing, the province being surrounded with good fishing ground. Marble craft is another industry of the people, marble blocks being plentiful in the province especially in Romblon Island. Basket and mat weaving are minor industries which give added income to the farm families.

Romblon Province falls under the third type of climate in the Philippines. It is relatively dry from November to April and wet during the rest of the year. Maximum rain periods are not very pronounced, with the short dry season lasting only from one to three months.

The principal crops of the province are coconut and rice. Secondary crops are corn, bananas, root crops, fruit trees, mungo, and vegetables. Livestock being raised in the province are carabao, cattle, hogs, goats, sheeps, while poultry products are chickens, ducks, geese, turkeys and pigeons. Raising of livestock and poultry are only secondary industries among the farmers in the province.

There are three general land types classified according to relief, namely: (1) soils of the plain, (2) soils of the upland, hills and mountains, and (3) miscellaneous land types. The

soils of the plain are developed through the deposition of soil materials from the surrounding upland and rolling areas. They include the Mogpog and Laylay series. They cover an aggregate area of about 12,765.4 hectares or 9.6 per cent of the total land area of the province. The soils of the upland, hills, and mountains are residual soils derived from different parent materials. They include the Romblon, Odiongan, Tuguis, Lonos, Santa Fe, España, Tupi and Zamboanguita series and the Malalag-Faraon complex. They cover a total area of about 104,458.8 hectares or 76.8 per cent of the total area of the province. The miscellaneous land types with an area of about 16,039.8 hectares or 11.8 per cent include the Hydrosol, Beach sand, and Mountain soils, undifferentiated. About 1.8 per cent or 2,329 hectares covering Maestre de Campo Island are unclassified.

The soils of Romblon Province are classified according to their land capability classes and sub-classes. Mogpog clay loam is classified as sub-class Bw. The area can be cultivated safely but needs drainage in addition to good farm management practices to maintain productivity. Laylay sandy clay loam and Mogpog sandy loam are lands that can be cultivated safely, but because of low fertility needs special management practices to maintain productivity. These soil types fall under sub-class Bs. Lands that fall under capability sub-class Ce are moderately good lands that can be cultivated safely provided a carefully planned combination of conservation practices are applied. Included in this sub-class are portions of the Odiongan, Tuguis, España, and Zamboanguita series. Lands under capability sub-class De which include portions of Tuguis, Odiongan, Lonos, Tupi, Zamboanguita, Santa Fe, and España series are lands good enough for occasional cultivation if handled with care but best suited to pasture or forest. The slope is up to 25 per cent. Sub-class Ds land is nearly level to sloping with a deep soil but low in available moisture. It is best suited to pasture or forest. Lands with a slope of 40 per cent are classified as capability class M. They are not suited for cultivation but good for grazing or forest if handled with great care. Included under this class are portions of Lonos, Tupi, Zamboanguita, Santa Fe, Romblon, and España series. Malalag-Faraon, complex, a portion of Romblon clay, and Mountain soils, undifferentiated are classified as capability class N. They are very steep lands, rough, eroded, with shallow soils that can be used for grazing or

forest if handled with great care. These lands are best suited for forest. Hydrosol is classified under capability class X. The land under this class is suited for wildlife or recreation.

Soil erosion in the province of Romblon begun since the early settlers occupied and cleared the land. Vegetative cover were cut down and burned thereby exposing the soil to the direct beating of the rain. When the soil can no longer hold the excess water, runoff is formed on the surface. The intensity of rainfall, slope of the land and the type of soil determine the velocity of runoff. The faster the velocity of runoff, the more will be its eroding power. Different degrees of soil erosion have taken place in the province of Romblon. Out of the total land area of 135,593 hectares, only 11,968.7 hectares or 8.8 per cent have no apparent erosion. About 6,093.1 hectares or 4.5 per cent are slightly eroded, that is, about one-fourth of the original surface soil is eroded. Moderate erosion which removed one-fourth to less than three-fourth of the original surface soil has affected about 19,890.6 hectares or 14.6 per cent of the total area. About 79,374.6 hectares or 58.6 per cent have been severely eroded to the extent that all of the surface soil and about one-half to three-fourth of the subsoil have been removed. Normal erosion occurs in the primary forest in the interior of Sibuyan Island. In this case, the amount of soil being eroded is balanced by the formation from the underlying parent material. This type affects about 15,937.1 hectares or 11.7 per cent of the total soil area of the province. About 2,329 hectares or 1.8 per cent covering the island of Maestre de Campo are unclassified.

The physical effect of erosion is the removal of the surface soil which contains most of the nutrient elements needed by the plants. Once the surface soil is carried away from the original place, the plants will suffer nutrient deficiency which will eventually reduce crop yields. Soil erosion also increases flood hazards in some parts of the country. Siltation of canals, dams, and rivers are also the effects of soil erosion.

There are several methods of erosion control, namely, mechanical and vegetative. Mechanical measures include contour tillage, terracing and diversion ditches. Vegetative means may include cover cropping, strip cropping, buffer strip cropping and grassed waterways.

I. RECONNAISSANCE SOIL SURVEY OF ROMBLON PROVINCE

DESCRIPTION OF THE AREA

Location and extent.—Romblon Province is separated from the island of Panay by the Tablas Strait and Sibuyan Sea. It is composed of the islands of Tablas, Sibuyan, Romblon, Banton, Maestre de Campo, Carabao, Simara, Alad, Cobrador, Logbung and a number of islets. These islands are scattered over a wide area extending from a point near Marinduque in the north to the coast of Panay in the south, and from the coast of Mindoro in the west to the island of Masbate in the east. The province as a whole is within 12° and 13° latitude and between 121° 40′ and 122° 45′ longitude. Tablas Island is the largest in the group. It is covered with mountain ranges extending from north to south. Sibuyan Island, next to Tablas in area, is crescent-shaped. It is very high having one peak rising abruptly to a height of 2,052 meters above sea level. Romblon Island is the third largest in the group situated between Tablas and Sibuyan. Between Tablas and Banton lies Simara Island. Far west of Banton and a few kilometers away from the coast of Mindoro Oriental is the island of Maestre de Campo, formerly Sibali. The capital of the province is Romblon, which is approximately 187 nautical miles south of Manila. Including all minor islands, Romblon Province has an area of 135,593 hectares.

Relief and drainage.—The relief of Romblon Province ranges from coastal plain to rolling, hilly and mountainous. Areas located along the coast ranges from nearly level to gently sloping while those at the interior are mostly rolling to hilly and mountainous.

The prominent peaks in Sibuyan Island are Mt. Guitinguitin and Mt. Nailog; Tablas Summit (665 meters) in Tablas Island; Banton Peak (615 meters) in Banton Island; and Agbaluto Peak (365 meters) in Romblon Island. Numerous rivers and creeks that flow toward the surrounding sea drained the province well. Among the largest rivers of the province are the Sablayan River in Romblon Island; Odiongan and Looc

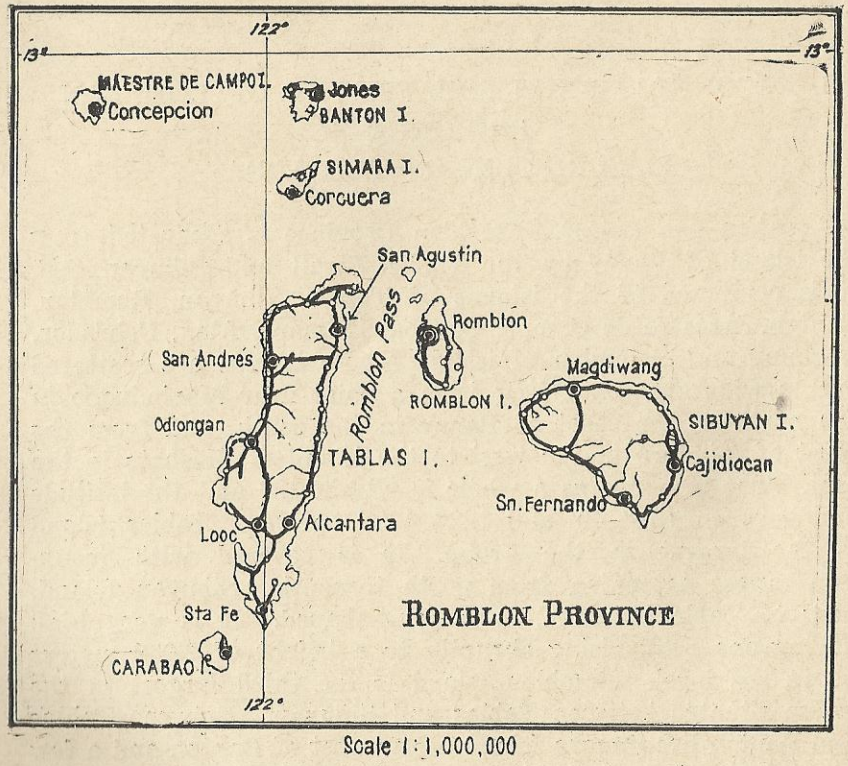


Fig. 2.—Relief Map of Romblon Province.

Rivers in Tablas Island; and Cantingas, Punog, Olango, Cambajao, and Pato-o Rivers in Sibuyan Island. Numerous creeks that lead to the rivers add to the adequate drainage in the interior. Most rivers, especially those in Sibuyan Island are easily swollen during a heavy rain because of their narrow courses and steep slopes.

Vegetation.—The vegetative cover of Romblon Province consists four types, namely; forest, grasses and shrubs, swamps and marshes, and cultivated crops. The soil cover of the province according to the census and statistics figures of 1946 are as follows:

Kinds	*Area (Ha.)*	*Per cent*
Commercial forest	28,058	21.14
Non-commercial forest	32,390	24.41
Open land and cultivated field	71,656	54.00
Swamps and marshes	600	.45

The forest cover are of two types, primary and secondary. Primary forests are found in the higher slopes of Sibuyan Island. Species found in the area are laua-an, apitong, tanguile, narra, yakal, etc. Secondary forests which are the results of indiscriminate logging and *kaingin* operations are mostly found in the lower slopes adjacent to the primary forest areas. These also cover the higher slopes of Tablas and Romblon Islands. Cogon and talahib are the grasses most common in the uncultivated areas. The alluvial plains as well as the undulating and rolling areas are cultivated to farm crops. The most common crops grown are rice, corn, coconut, bananas, fruit trees, root crops and vegetables. The swamps and marshes are covered with nipa palm, *bacauan, bangcal* and other halophytic plants.

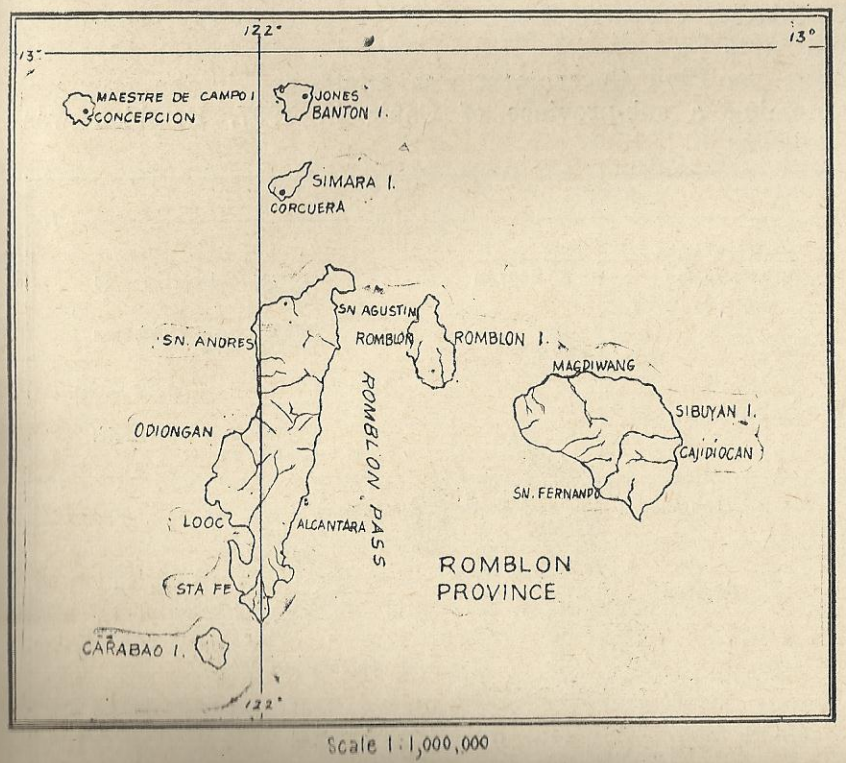
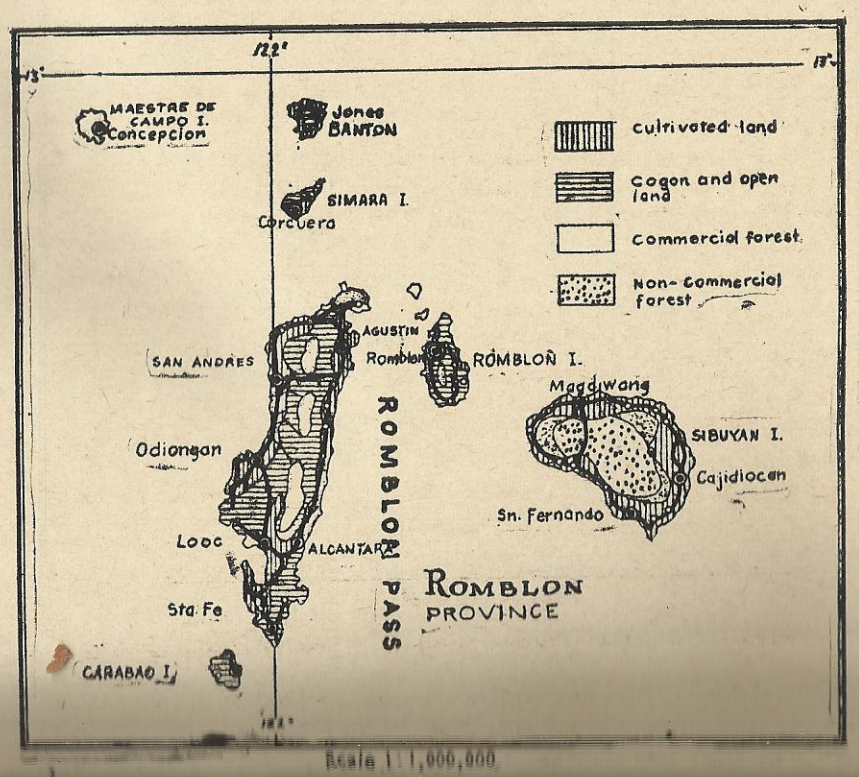


Fig. 3.—Map of Romblon Province showing the natural drainage pattern.

Organization and population.—Few authentic accounts or records are available to establish how the province derived its name. In 1582, in the course of Loarca's visit to the Phil-

ippines, he made mention of the islands of Lomlom or Donblon (Romblon), Banton, Simara, and Osingan (Tablas). The present name of the province is Romblon, probably being derived from the name of one of the islands in the group. During the Spanish era, the islands comprising Romblon were administered by the Secular Clergy. In 1635, the Recollect Fathers arrived at Romblon and found some of the natives already professing the christian faith. In 1818, Romblon was incorporated into the province of Capiz. Then in 1863, the islands were organized into a *politico-commandancia* administered from Capiz and continued until the twilight of the Spanish rule. Beginning 1898, when the Revolutionary Government took control of the islands-scattered province, Colonel Riego de Dios ruled the province with Azagra, Badajos, Banton, Cajidiocan, Corcuera, Looc, Magdiwang, Odiongan, Despojols, and Santa Fe as centers of his command. On March 16, 1901, American Civil Government was established in the province. Becoming a sub-province of Capiz in 1907, Romblon was



organized into a regular province in 1918. The Department of Interior, by virtue of Commonwealth Act 581 organized the province into four special municipalities under its direct control. The Japanese forces occupied the province from March 21, 1942 until liberation. Then, on January 1, 1947, Romblon was again returned to its independent provincial status by virtue of Republic Act No. 38.

The province of Romblon is one of those sparsely populated. In 1948 census, the population of the province was 108,817 which rose to 131,658 in 1960 census, an increase of 22,841 or 17.34 per cent for a period of 12 years. The area and population of the province by municipalities according to the 1960 census of the Philippines are as follows:

Municipalities		*Population*
Banton	2,827	6,153
Cajidiocan	16,144	9,700
Concepcion	2,329	2,998
Corcuera	2,343	6,510
San Andres	7,551	6,480
Looc	14,061	17,427
Magdiwang	11,196	4,802
Odiongan	17,015	22,859
Romblon	12,712	16,708
San Agustin	20,903	18,373
San Fernando	19,008	10,659
Santa Fe	9,504	8,987
Total	135,593	131,658

Transportation and market.—Tablas, the largest among the islands comprising the province is surrounded by a national and provincial road that connect all towns and some barrios. The same is true to Sibuyan and Romblon Islands. The local office of the Highway District Engineer has a record of 228.41 kilometers of national road, and 256.01 kilometers of provincial road for the three islands of Tablas, Romblon and Sibuyan. Out of these figures, 111.72 kilometers are considered first class road; 276.05 kilometers as second class road; and 96.65 kilometers as third class road. Romblon, the capital of the province is an island municipality located midway between the islands of Tablas and Sibuyan. It is accessible by motorboat from Carmen and San Agustin in Tablas, and from Magdiwang and the coastal barrios of Cajidiocan in Sibuyan Island. Carmen and Poctoy are the ports of all at Tablas Island where

blon, which has the best harbor, is a port of call for inter-island vessels from Manila, Panay, and other ports in the Visayas. The shipping companies serving these ports are the Philippine Steam Navigation Company and the Filipinas Pioneer Lines, Inc.

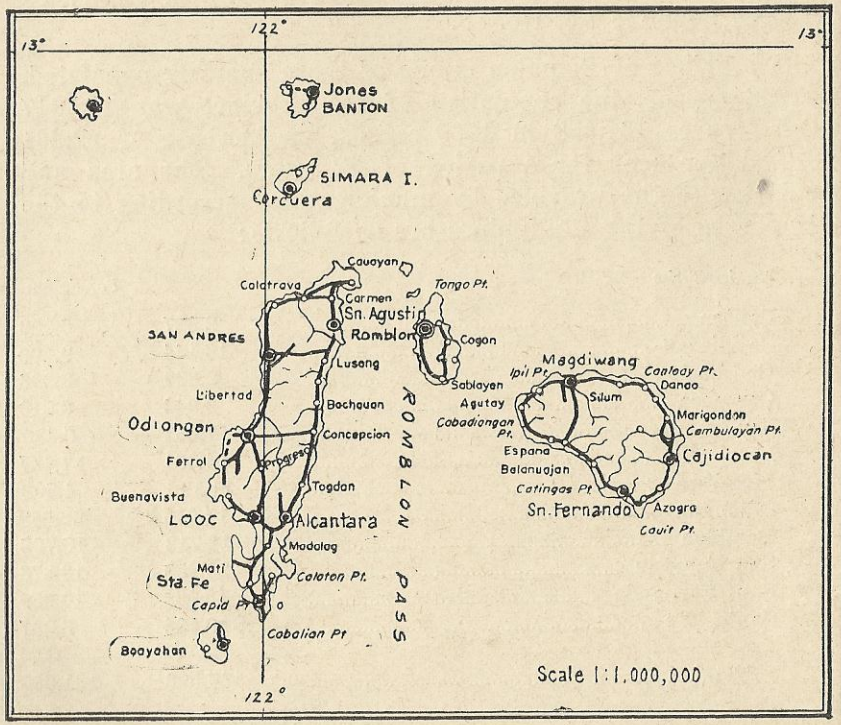


Fig. 5.—Road Map of Romblon Province.

The only airport open for air service in the province is located at Tugdan in Tablas Island. The Philippine Air Lines, Inc. which operate an air service between Manila and Panay Island also serve Tugdan airport three times a week. The Air Manila which serves Panay Island has a daily scheduled flight to Tugdan airport to accommodate more passengers in the province.

Odiongan, Looc, San Agustin, and San Andres in Tablas have the biggest markets where farm products are sold. Romblon has a market for the farm products of Romblon Island. In Sibuyan Island, the municipalities of Cajidiocan, San Fernando,

and Magdiwang are the chief markets where the farm products are sold. Marketing of farm products from one island to another is not so much practiced due to the inconveniences of transporting these products.

Water supply.—Practically all municipalities of the province are provided with a good potable water supply. There are good sources of water coming from natural springs. Some barrios that are not reached by these water systems are provided with artesian wells and pumps.

Geology.—Geologically, Romblon Island Group is made up of a wide variety of igneous, sedimentary and metamorphic rocks ranging from pre-Tertiary to Quaternary in geologic age. Pre-Tertiary rock units consist of schists, marble, altered volcanic rocks and ultramafic rocks, the bulk of which are found in the larger islands of Sibuyan, Romblon, and Tablas. Rock units on eastern Romblon Island are dominantly pre-Tertiary in age. On the western part older rock units are overlain in parts by members of several Tertiary rock sequences. Metamorphic rocks of pre-Jurassic age are overlain by altered volcanic rocks. The metamorphic rocks of Romblon include amphibolite schist, quartz-albite-mica schist, greenschist and marble. Widespread amphibolite schists are associated with basic and ultramafic intrussive rocks. Quartz-albite-mica schist is a light colored rock with well pronounced planar structure and more or less definite mineral composition. Greenschists are metamorphic rocks occurring in Romblon, eastern Sibuyan and eastern Tablas Islands. In Romblon Island, the rock is closely associated with marble. It is primarily chlorite and albite. Marble occurs either interbedded with or overlying the various crystalline schists and covers about two-fifth of the aggregate area of Romblon Island and of the adjacent islands of Alad, Cobrador and Logbung.

Deposition of Tertiary limestone and clastic sedimentary rock on the existing rock floor begun during miocene with its greater development in Tablas and Carabao Islands. In western Tablas, extensive late miocene sedimentary rocks are herein referred to as the Anahao formation. The rocks of this formation are disposed in a north-south trend. Interbedded bioclastic limestone, feldspathic and Tuffaceous sandstone, calcareous mudstone and shale make up the Anahao formation. Late Tertiary to Quaternary volcanic rocks predominate in the islands of Banton and Simara.

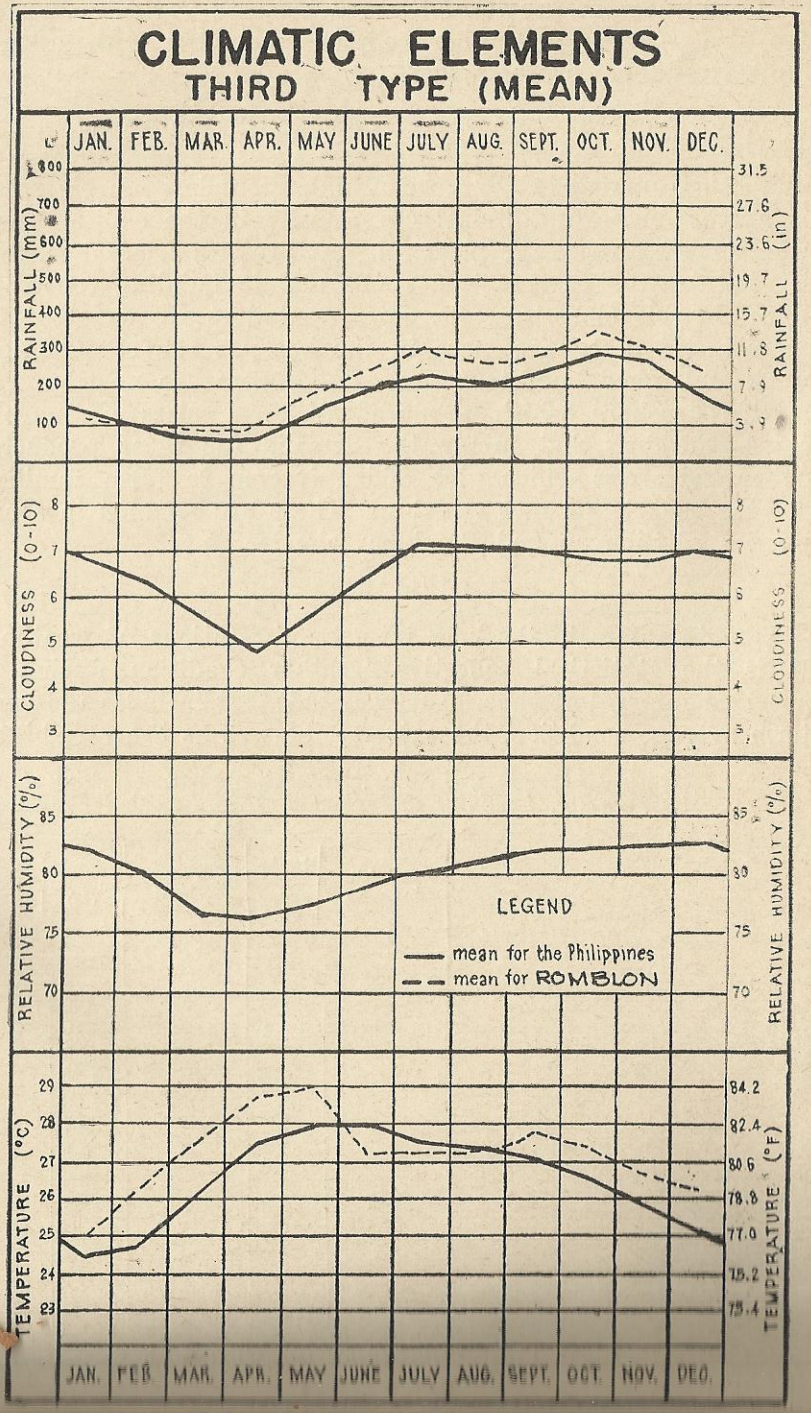


Fig. 7.—Graph of the third type of Climate of the Philippines and of

of weather elements such as highest and lowest temperatures, the greatest amount of rainfall recorded, etc. Weather on the other hand, usually means the condition of the atmosphere at a particular time. It is thought of in terms of temperature, humidity, precipitation, cloudiness, brightness, visibility, and wind on a certain day or hour.

The Philippines is located in the tropics. The climate over any particular place is due to its geographical location and the different wind systems that prevail over the locality during different times of the year. Climate in the Philippines has been described in terms of the characteristics of the distribution of rainfall received in a locality during the different months of the year. Based on this classification, we can say that there are four climatic types in the Philippines.

Romblon Province falls under the third type of climate in the Philippines. Seasons are not very pronounced. It is relatively dry from November to April and wet during the rest of the year. The maximum rain periods are not very pronounced, with the short dry season lasting only from one to three months (Table 1).

AGRICULTURE

Although the terrain of Romblon Province is generally rugged and mountainous, farming remains as the number one industry of the people and the main source of their livelihood. Since the early days, the natives have tilled the land for food, clothing, and shelter. The hills and mountainous areas of Tablas and Romblon Islands are now deforested, an indication that farming has extended beyond these portions occupied by forest.

The census figures on agriculture in 1948 present a record of 24,444.04 hectares under cultivation. In 1960, census figures show that there are 47,957.5 hectares of cultivated land or an increase of 23,513.46 hectares over that of the 1948 figures. This increase in hectarage of cultivated area shows that the people of the province are more inclined to farming than in any other industry.

The principal crops grown in the province are coconut, rice and corn. Secondary crops are bananas, mungo, root crops, fruit trees and vegetables. The area, production and value of produce of the ten leading crops of Romblon Province according to the census figures on agriculture in 1960 are as follows:

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Crops	*Area (Ha.)*	*Production*	*Value (Pesos)*
Coconut	22,194.7	69,409,788 nuts	4,563,816
Palay	10,144.5	193,545 cavans	1,477,704
Bananas	1,132.0	5,640.002 kg.	426,213
Corn	3,262.2	36,746 cavans	241,027
Tobacco	115.9	50,974 kg.	99,265
Camote	415.0	1,032,266 kg.	78,622
Cassava	310.3	1,042,667 kg.	51,926
Mungo	320.1	92,664 kg.	50,495
Abaca	28.2	20,636 kg.	12,146
Mango	30.1	42,465 kg.	8,695

Coconut.—This is the number one money crop in the province. According to the 1960 census of the Philippines on agriculture, the area planted to this crop was 22,194.7 hectares with a total of 3,085,725 trees. Out of this number, 2,206,602 trees were bearing; 862,227 trees were non-bearing; and 16,896 trees were tapped for tuba. The production was 69,409,788 nuts valued at ₱4,563,816.00; and 4,520,903 liters of tuba valued at ₱745,286.00.

This crop is grown practically in every municipality and coastal barrio of the province. The leading municipalities in the production of this crop are San Agustin, Odiongan, and Romblon. Sundrying and smoking are the common methods employed in making copra. Harvesting is done once in every three months. An average of 10 to 15 nuts per tree can be gathered per harvest according to information from farmers in the locality.

Rice.—Rice is the most important staple crop in the province. As reported in the 1960 census on agriculture, the total area planted to rice was 10,144.5 hectares. Out of this area, 4,513.5 hectares were under upland and *kaingin*. The production for lowland area was 128,647 cavans while 64,898 cavans were produced from the upland and *kaingin*. Upland rice is mostly grown in the upland and rolling areas of Tablas and patches in Romblon Island. Patches of *kaingin* are found along the hills and mountain sides of Tablas, Romblon, and Sibuyan Islands. The municipalities leading in the production of rice are Odiongan, Looc, Santa Fe, San Andres, and San Agustin.

Corn.—Corn is mostly grown in the upland and rolling areas of Tablas Island. It is grown for both human consumption and animal feeds. The census figures on agriculture of 1960 show that there were 3,262.2 hectares planted to corn with a

total production of 36,746 cavans valued at ₱241,027.00. The leading municipalities in the production of this crop are Odiongan, San Agustin, Corcuera, Looc, San Andres, and Santa Fe. Other municipalities also grow corn but on a limited scale.

Camote.—This is another important secondary crop of the province. It is utilized either for human consumption or animal feeds. According to the 1960 census figures on agriculture, the province has 415 hectares planted to this crop with a production of 1,032,266 kilos valued at ₱78,622.00. The municipalities leading in the production of camote are Corcuera, San Agustin, Santa Fe, Looc, Odiongan, and Magdiwang. The production of this crop is not on commercial scale.

Cassava.—Like camote, the production of this crop is not on commercial scale. It is utilized for both human consumption and animal feeds. According to the 1960 census figures on agriculture, there were 310.3 hectares planted to this crop. The production was 1,042,667 kilos valued at ₱51,926.00.

Banana.—On account of the limited market in the province, this crop is not grown on commercial scale. They are planted in patches on slopes and hills and on backyards. The 1960 census figures on agriculture show 1,132 hectares planted to this crop. The production was 5,640,002 kilos valued at ₱426,213.00. The municipalities leading in the production of this crop are Odiongan and Santa. Fe.

Mungo.—The leading municipalities in the production of mungo are Odiongan and San Andres. This crop is planted in rotation with rice. According to the 1960 census figures on agriculture, an area of 320.1 hectares was planted to mungo with a production of 92,664 kilos valued at ₱50,495.00.

Tobacco.—This is another money crop in the province. The variety being grown is mostly the native one. The leaves are locally made into cigar, cigarettes and chewing tobacco which are sold in the local markets. The municipalities leading in the production of this crop are San Agustin, Cajidiocan and Santa Fe. The 1960 census figures on agriculture show 115 hectares planted to tobacco with a total production of 50,735 kilos valued at ₱98,596.00.

Abaca.—According to the 1960 census figures on agriculture, the area planted to abaca was 28.2 hectares with a total production of 20,636 kilos valued at ₱12,146.00. The leading municipalities in the production of this crop are San Andres

and San Agustin. The products are utilized for the manufacture of ropes and twines which are sold at the local markets.

FARM PRACTICES

Farm operations are commonly accomplished by a carabao-drawn plow. The native plow and harrow are the main farm implements for tillage operations. Application of fertilizers is now a common practice among some farmers. However, due to scarcity of supply and high cost of this product, not all farmers can take advantage of this factor of increasing crop yield. Straight planting and clean culture on lowland rice are being practiced by majority of the farmers in the locality.

The rolling and hilly areas of Tablas Island planted to corn, upland rice and root crops are subject to soil erosion enchanced mostly by farm operations. Soil erosion also exists in other island comprising the province where row crop cultivation is practiced. Plowing and other farm operations are sometimes done up and down the slope which promote the washing down of the soil during a heavy rain. Sheet as well as rill erosion has taken place as indicated by the presence of tiny rivulets running down the hills of a newly plowed and unprotected field. Planting of different crops in succession such as corn after rice or mungo after corn are usually done, but they are not following a planned system of crop rotation. Green manuring and compost application are not practiced in the province. Cover cropping is being done by few farmers in some barrios of Odiongan and Looc. Strip cropping and contour planting are not commonly done in the locality.

Kaingin system of farming is still practiced not only in Tablas but also in Romblon and Sibuyan Islands. This system of farm operation is not only destructive to the forest resources but also the soil hence, the practice should be discouraged. Steeper slopes that have been bared of vegetative cover should be reforested to protect the soil from being further washed away during the rainy season.

LIVESTOCK AND POULTRY INDUSTRY

According to the agriculture census of 1960, the different livestock raised in Romblon Province are carabao, cattle, hogs, horses, goat and sheep, while the poultry are chicken, ducks,

geese, turkeys, and pigeons. The number and value of livestock and poultry in the province according to the census figures of 1960 are as follows:

Livestock and Poultry	*Number*	*Value (Pesos)*
Carabao	20,920	3,144,259
Cattle	10,610	1,367,648
Hogs	31,621	1,213,718
Horses	1,686	117,247
Goats	12,763	88,442
Sheep	274	4,960
Chicken	216,981	229,221
Ducks	3,901	5,196
Geese	299	541
Pigeons	743	533
Turkeys	60	277

The islands of Tablas, Romblon, Sibuyan and Carabao have a wide area of land well suited to pasture. The Bureau of Animal Industry, in an effort to enhance and improve the local breeds of livestock and poultry of the province has established a breeding station in the municipality of Odiongan. This breeding station is situated at about seven kilometers along the national road leading to the municipality of Looc.

The raising of livestock and poultry is just a secondary industry among the people of the province. On account of the high cost of feeds and lack of market for the products in the locality, poultry raising on commercial scale is not profitable.

LAND-USE CHANGES

The land-use changes in the province are from forest land and idle land to crop land and pasture land. There is an increase in the area devoted to crop land and pasture land to provide more food for the increasing number of population from year to year. In 1948 census of the Philippines, the cultivated area of Romblon Province is 24,444.04 hectares which increased to 47,957.5 hectares in 1960 census, or an increase of 23,513.46 hectares for a period of twelve years. This expansion of agricultural area greatly affects the other types of land in the province. Indiscriminate logging and *kaingin* system of farm operation have taken place since the early settlers occupy the area. As a result, the island of Tablas, Romblon, and other small islets comprising the province are almost bare. Very little forest cover, mostly on the rugged areas and mountains in the interior exists. In some portions

that are bare of vegetative cover, special attention should be given to save the land from further destruction caused by excessive washing down of the soil during the rainy season.

On the rolling and mountainous agricultural areas, soil erosion of varying degrees has taken place. To determine the extent of erosion, a reconnaissance erosion survey was undertaken simultaneous with a reconnaissance soil survey and will be treated more in the later part of this report. Suffice to mention that those areas that are bare of vegetative cover should be planted to permanent crops, trees, and cover crops to minimize soil erosion and conserve moisture during the dry season.

FARM TENURE

Farm tenure refers to the manner in which a farm is held by its operator. In farm tenure classification, the Bureau of the Census and Statistics during the 1960 census year classified farm operators into five categories, namely, (1) full owners, (2) part owners, (3) tenants, (4) farm managers, and (5) farm operators under other conditions. Tenants are further classified as (a) cash tenants, (b) fixed-amount-of-produce tenants, (c) share-of-produce tenants, (d) cash and fixed-amount-of-produce tenants, (e) cash and share-of-produce tenants, and (f) rent-free tenants.

The total number of farms and the total area of those farms by tenure of farm operator in Romblon province according to census figures of 1960 were as follows:

Tenure of farm operator	*Total Number of Farms*	*Total Area of Farms (Ha.)*
Full owner	6,648	21,993.2
Part owner	2,442	7,944.4
Tenant:		
Cash tenants	29	94.3
Fixed-amount-of-produce tenants	173	409.5
Share-of-produce tenants	5,095	13,223.4
Cash and fixed-amount-of-produce tenants	35	175.7
Cash and share-of-produce tenants	98	285.0
Rent-free tenants	115	277.7
Other tenants	186	806.2
Manager	26	2,692.5
Other forms of tenure	35	55.6
Total	14,982	47,957.5

TYPES OF FARM

The Bureau of the Census and Statistics during the 1960 census year classified farms into 14 types, 10 of which are grouped as crop farms. The ten crop farms classified which were based on the first 10 major crops in the country are as follows: (1) palay farm, (2) corn farm, (3) sugar cane farm, (4) abaca farm, (5) tobacco farm, (6) vegetable farm, (7) root crop farm, (8) coconut farm (9) fruit farm, and (10) coffee farm. The relationship between the physical area planted to a particular crop, on one hand, and the cultivated land on the farm, on the other, is taken into primary consideration. A crop farm is typed according to the particular crop which occupies 50 per cent or more of the cultivated part of the farm.

The four other types of farms are (11) hog farms with 20 or more hogs regardless of area, (12) livestock farms which satisfy any of these conditions, namely: (a) the area is 10 hectares or more with at least 10 heads of any specific kind of livestock and the cultivated area is less than 20 per cent of the total area of the farm, or (b) the area is less than 20 hectares provided there are more than 20 heads of any specific kind of livestock (except hogs) and the cultivated area of the farm is less than 20 per cent of the total area of the farm, (13) poultry farms are farms which do not qualify as crop farms and satisfy any of these conditions, namely: (a) there are more than 300 chickens regardless of area, (b) there are more than 100 laying chickens or ducks regardless of area, or (c) there are more than 200 other specific kinds of poultry other than chickens; and (14) other farms which are those that could not be classified under any of the aforementioned thirteen types of farms, grouped as follows: (a) farms planted to palay, corn, coconut, abaca, tobacco, and/or sugar cane without any of them occupying 50 per cent or more of the cultivated land, or (b) farms planted to other miscellaneous crops such as cotton, cacao, kapok, ramie, bamboo, etc., even if one of them occupied 50 per cent or more of the cultivated land.

The total number of farms and the total area of these farms by type of farm in Romblon Province according to census figures of 1960 were as follows:

Type of Farm	*Total Number of Farms*	*Total Area of Farms (Ha.)*
Palay	4,582	11,881.1
[illegible]	185	186.9

Sugar cane	—	—
Abaca	—	—
Tobacco	3	7.5
Vegetable	4	7.0
Root crops	88	114.4
Coconut	9,808	30,578.9
Fruit	70	133.3
Coffee	—	—
Hog	3	45.5
Livestock	47	4,594.9
Poultry	1	0.1
Others	291	908.6
Total	14,982	47,957.5

The total number of farms and the total area of these farms by size of farm in Romblon Province according to census figures of 1960 were as follows:

Size of Farm	*Total Number of Farms*	*Total Area of Farms (Ha.)*
Under 0.2	17	16
0.2 and under 0.5	194	60.9
0.5 and under 1.0	855	542.5
1.0 and under 2.0	5,281	6,743.2
2.0 and under 3.0	3,718	8,291.1
3.0 and under 4.0	2,030	6,491.4
4.0 and under 5.0	1,000	4,153.1
5.0 and under 10.0	1,513	9,514.2
10.0 and under 15.0	225	2,524.3
15.0 and under 20.0	42	684.8
20.0 and under 25.0	24	529.9
25.0 and under 50.0	39	1,275.5
50.0 and under 100.0	22	1,443.4
100.0 and under 200.0	12	1,494.9
200.0 and over	10	4,207.7
Total	14,982	47,957.5

SOIL SURVEY METHODS AND DEFINITIONS

Soil surveying consists of (1) the determination of the morphological characteristics of the soil, (2) the grouping and classification of soils into units according to their characteristics, (3) their delineation on maps, and (4) the description of their characteristics in relation to agriculture and other activities of man.

Soils, their landscape and underlying formation, are examined in as many sites as possible. Borings with the

road cuts are studied. An excavation or road cut exposes a series of layers collectively called the soil profile. The horizons of the profile, as well as the parent materials beneath, are studied in detail and the color, structure, porosity, consistency, texture, and the presence of organic matter, roots, gravels and stones are noted. The reaction of the soil and its content of lime and salts are determined either in the field or in the laboratory. The drainage, both external and internal, and other features such as the relief of the land, climate, natural and artificial features are taken into consideration, and the relationship of the soil and the vegetation and other environmental features are studied.

On the bases of both external and internal characteristics, the soils are grouped into classification units, of which the three principal ones are (1) soil series, (2) soil types, and (3) soil phase. When two or more of these mapping units are in such intimate or mixed pattern that they cannot be clearly shown on a small scale map, they are mapped or grouped into a (4) soil complex. Areas of land that have no true soils, such as river beds, coastal beaches, or bare rocky mountain sides are called (5) miscellaneous land types. Areas that are inaccessible like mountains and great forest areas whose classification is of no agricultural importance for the present are classified as (6) undifferentiated soils.

A series is a group of soils that have the same genetic horizons, similar important morphological characteristics and similar parent material. It comprises of soils which have essentially the same general color, structure, consistency, range of relief, natural drainage condition, and other important internal and external characteristics. In the establishment of a series, a geographic name is selected, taken usually from the locality where the soil was first identified. For example, the Romblon series was first described and identified in the vicinity of Romblon municipality.

A soil series has one or more soil type, defined according to the texture of the upper part of the soil, or the surface soil. The class name such as sand, loamy sand, sandy loam, silty clay loam, clay loam or clay is added to the series name to give the complete name of the soil. For example, Romblon clay is a soil type within the Romblon series. The soil type, therefore, has the same general characteristics as the soil series except for the texture of the surface soil. The soil

type is the principal mapping unit. Because of its certain specific characteristics, it is usually the unit to which agronomic data are definitely related.

A phase of a soil type is a variation within the type, differing from the soil type only in some minor features, generally external, that may be of special practical significance. Differences in relief, stoniness, and extent or degree of erosion are shown as phases. A minor difference in relief may cause a change in the agricultural operation or change in the kind of machinery to be used. The phase of a type with a slight degree of accelerated erosion may differ in fertilizer requirement and cultural management from the real soil type. A phase or phases of a type due mainly to degree of erosion, degree of slope and amount of gravels and stones in the surface soil is usually segregated on the map if the area can be delineated.

A soil complex is a soil association composed of such intimate mixture of series, types, or phases that cannot be indicated separately, on a small scale map. This is mapped as a unit and is called a soil complex. If, in an area, there are several series such as Faraon, Malalag and Tupi that are mixed together, the complex must bear the names of the two dominant series, such as Malalag-Faraon complex or Malalag-Tupi complex as the case may be. If there is only one dominant constituent, the complex bears the name of that series as Malalag complex.

Surface and subsoil samples for chemical and physical analyses are collected from each soil type or phase, the number being determined by the importance and extent of such soil types or phases. Profile samples are also obtained for further morphological studies of important soil types.

The soil survey party, composed of two to three technical men maps the area and delineate the various soil types, phases, complexes, and miscellaneous land types. All natural and cultural features found in the area are indicated on the soil map, such as trails, railroads, telephone and telegraph lines; bridges, barrios, towns and cities; rivers and lakes; prominent mountains, and many others.

THE SOILS OF ROMBLON PROVINCE

Soil is a natural medium for the growth of land plants. It is generally a mixture of fragments of partly or wholly

weathered rocks and minerals, organic matter, water and air in greatly varying proportions, and having developed layers produced through the action of climate and living organisms. It is the product of action of the physical, chemical and biological forces upon the rocks for thousands of years, thus, soil formation is apparently a slow process. There are many kinds of rocks that vary in hardness. Climatic elements necessary for the weathering of these rocks also vary in its internal as well as external characteristics. Generally, the decay of rocks rich in minerals will produce fertile soil.

The soils of Romblon Province are derived from different kinds of parent materials, namely, shale, sandstone, basalt, andesite, limestone, and metamorphic rocks such as marble, schist, quartzite and slate. The decay of these different parent materials produced different kinds of soil.

There are three general land types classified according to relief, namely, (1) soils of the plain, (2) soils of the upland, hills and mountains, and (3) miscellaneous land types. Further classification of these land types are made as to soil series and soil types based on the genetic and morphological characteristics of the profile. The soil types found in Romblon Province are as follows:

1. Soils of the Plain:

Soil Type	*Number*
a. Laylay sandy clay loam	945
b. Mogpog clay loam	506
c. Mogpog sandy loam	933

2. Soils of the Upland, Hills and Mountains:

a. Espana loam, stony phase	942
b. Espana sandy clay loam	941
c. Lonos loam	938
d. Lonos sandy loam	937
e. Malalag-Faraon complex	944
f. Odiongan clay loam	935
g. Romblon clay	934
h. Santa Fe loam	939
i. Santa Fe sandy loam	940
j. Tuguis clay	936
k. Tupi loam	771
l. Zamboanguita sandy loam	943

3. Miscellaneous Land Types:

a. Beach sand	118
b. Hydrosol	1
c. Mountain soils, undifferentiated	45

SOILS OF THE PLAIN

The soils of the plain were developed through the deposition of soil materials from the surrounding upland and rolling areas. These consist of coastal plain and flat lowland. They are composed of the Mogpog and Laylay series. The total area covered is approximately 12,765.4 hectares, or 9.6 per cent of the total area of the province.

TABLE 2.—*Approximate hectarage and proportionate extent of the soils of Romblon Province.*

Soil Mapping Number	Soil type/Complex/Miscellaneous Land Type	Area[1] (Ha.)	Per Cent
945	Laylay sandy clay loam	8,109.2	1.0
506	Mogpog clay loam	3,125.0	6.4
933	Mogpog sandy loam	1,531.2	2.2
942	Espana loam, stony phase	2,062.5	1.5
941	Espana sandy clay loam	5,359.3	3.9
938	Lones loam	15,203.1	11.2
937	Lones sandy loam	9,531.1	7.0
944	Malalag-Faraon complex	8,843.6	6.5
935	Odiongan clay loam	3,953.1	3.0
934	Romblon clay	13,927.8	10.2
939	Santa Fe loam	1,511.6	1.1
940	Santa Fe sandy loam	10,928.0	8.0
936	Tuguis clay	10,484.7	7.7
771	Tupi loam	13,281.0	9.8
943	Zambcanguita sandy loam	9,373.0	6.9
118	Beach sand	562.4	0.4
1	Hydrosol	600.0	0.5
45	Mountain soils, undifferentiated	14,877.4	10.9
	Unclassified	2,329.0	1.8
	Total	135,593.0	100.00

[1] Area of each soil type, complex and miscellaneous land type was determined with the use of a planimeter. No deduction was made for roads and rivers.

LAYLAY SERIES

This soil series was first established during the reconnaissance soil survey of Marinduque Province. The soil is of recent coastal deposits. The relief is level. Lowland rice and coconut are the principal crops grown. Other crops like corn, fruit trees and vegetables are also found.

Laylay sandy clay loam (945).—The surface soil is grayish brown (10YR 5/2) sandy clay loam; granular structure; friable when moist and soft when dry. Roots can easily penetrate

this layer. The boundary to subsoil is smooth and clear. The depth is 30 centimeters. The subsoil is light brownish gray (10YR 6/2) structureless sandy loam. Sand and gravels are sometimes present. Its boundary to substratum is smooth and clear. The depth is 90 to 110 centimeters from the surface. The substratum is yellowish brown (10YR 5/6) structureless, friable sandy loam. Sand and gravels are numerous in this layer. The depth is 150 centimeters from the surface.

This soil type is mapped along the coastal areas of barrio Danao, Cajidiocan, Magdiwang in Sibuyan Island and in San Agustin, Alcantara, and Odiongan in Tablas Island. It has an aggregate area of about 8,109.2 hectares.

The principal crops grown in this soil type are lowland rice and coconut. The varieties of rice commonly used are BPI–76, Peta, Camuros, Casunsun, and many other local varieties. The average production of the first two varieties ranges from 30 to 35 cavans per hectare according to information from farmers in the locality.

MOGPOG SERIES

Mogpog series was first established during the reconnaissance soil survey of Marinduque Province. It is of recent alluvial deposits. The relief is nearly level. External and internal drainage are poor.

The surface soil is dark brown (10YR 4/3) clay loam; with few reddish brown (2.5YR 4/4) mottlings; granular structure; slightly sticky and moderately plastic when wet and slightly hard when dry. Boundary to subsoil is smooth and gradual. Roots can easily penetrate this layer. It has a pH value of 6.9. The depth is 30 centimeters. The subsoil is yellowish brown (10YR 5/6) clay loam; reddish brown (5YR 5/4) mottles are present; medium granular structure; slightly sticky and moderately plastic when wet and slightly compact when dry. The boundary to substratum is smooth and diffuse. The depth is 30 to 90 centimeters from the surface. The substratum is brownish yellow (10YR 6/6) sandy clay loam; with numerous rootlike streaks; coarse granular structure; friable when moist and slightly compact when dry. Few black concretions are also present in this layer.

Mogpog clay loam (506).—This soil type covers the flat lowland along the vicinities of barrios Rizal, Tulay, Mayha, Anahao, Dapauan, Batiano and Panique in the municipality from 40 to 45 cavans according to information from farmers municipality of San Andres. The total aggregate area of this soil type is approximately 3,125 hectares.

Lowland rice is the principal crop grown in this soil type. The varieties commonly planted are the BPI–76, Peta, Camuros, Casunsun, and others. The yield per hectare ranges from 40 to 45 cavans according to information from farmers in the locality. Secondary crops grown in patches are coconut, mongo, vegetables and fruit trees.

Mogpog sandy loam (933).—The surface soil is dark brown (10YR 4/3) sandy loam; coarse granular structure; friable when moist and non-sticky and non-plastic when wet. This soil type is mapped along the lowland areas in the municipalities of Santa Fe and Alcantara. Small patches are also mapped in the vicinities of barrios Bagolayag and Ferrol and in the municipality of Odiongan. It has an aggregate area of approximately 1,531.2 hectares. The principal crop of this soil type is lowland rice. The varieties commonly planted are BPI–76 and Peta. The yield per hectare ranges from 30 to 35 cavans. Secondary crops grown are corn, coconut, mungo, vegetables and fruits trees.

SOILS OF THE UPLAND, HILLS AND MOUNTAINS

The soils of the upland, hills and mountains are derived mostly from shale, sandstone, limestone, basalt, andesite, and from metamorphic rocks such as marble, schist, quartzite and slate. These soils cover the wider portion of the province having a total area of approximately 104,458.8 hectares or 76.8 per cent of the total land area of the province.

There are eight soil series and one soil complex included in this group. They are the Romblon, Odiongan, Tuguis, Lonos, Santa Fe, Espana, Tupi and Zamboanguita series and the Malalag-Faraon complex. Owing to their relief, the area is generally well drained both externally and internally except for Romblon and Tuguis soils whose internal drainage is fair to poor because of their dense subsoils. The principal crops grown in this group of soils are upland rice, corn and coconut. Secondary crops are different fruit trees, vegetables, and root crops.

ROMBLON SERIES

Romblon series was identified in the municipality of Romblon, hence its name. It is a residual soil developed through the weathering of the underlying marble rocks. The relief is strongly rolling to hilly. Numerous marble rocks are exposed as outcrops. The external drainage is excessive while internal drainage is poor. Coconut is the principal crop. Rice, corn, fruit trees, root crops, and vegetables are the secondary crops grown. Second growth forest is also found in the interior. A profile description is as follows:

Depth (cm.)	Characteristics
0–20	Surface soil, clay; olive brown (2.5Y 4/4) when moist and olive yellow (2.5Y 6/6) when dry, with yellowish brown (10YR 5/8) streaks; angular blocky structure; slightly friable when moist, sticky and plastic when wet, and very hard when dry. Numerous roots are present in this layer. The boundary to subsoil is clear and smooth. Marble rock outcrops are numerous. The pH value is 6.6.
20–70	Subsoil, clay; yellowish brown (10YR 5/8) when moist and yellow (10YR 7/8) when dry; angular blocky structure; sticky and plastic when wet and very hard when dry. The boundary to substratum is clear and wavy. Marble stones and pebbles are present. Marble blocks are embedded in this layer.
70–150	Substratum, clay; pale yellow (2.5Y 8/4) when moist and yellow (10YR 7/8) when dry; angular blocky structure; sticky and plastic when wet and very hard when dry. Metamorphic sand is found in this layer. Boulders or marble are embedded in this layer.

Romblon clay (934).—This soil type covers the northeastern part of Romblon Island and the northern tip of Tablas Island. It also covers the islands of Alad, Cobrador and Logbung having an aggregate area of about 13,927.8 hectares or 10.65 per cent of the total area of the province. The soil is generally shallow underlain by boulders of marble. Marble outcrops are also numerous. This portion is the source of marble product in the province.

Coconut is the principal crop grown in this soil type. Some patches planted to corn, rice, root crops, vegetables and fruit trees are also found in the area. Idle portions are being used

as marble quarries. Cogon and talahib are the predominating grasses in most idle portion of this soil type. Evidence of soil erosion such as gullies and rock outcrops are noticeable. Cultivation of this soil type for seasonal crops is not advisable. Permanent crops such as coconut and other fruit trees are best recommended for this area.

ODIONGAN SERIES

Odiongan series was mapped in the municipality of Odiongan. It is a primary soil derived from the weathering of the underlying limy shale and sandstone. It differs from the adjoining Tuguis series in the presence of numerous rounded metamorphic pebbles and stones on the surface and throughout the whole profile. Limestone pebbles which produced a white powdery mass when crushed are present in the subsoil and substratum. Marine shells are also embedded in the lower horizons. The relief is undulating to strongly sloping. The external drainage is excessive while internal drainage is good. The profile description as represented by Odiongan clay loam follows:

Depth (cm.)	Characteristics
0– 15	Surface soil, clay loam; yellowish brown (10YR 5/8) when moist and light yellowish brown (10YR 6/4) when dry; with few yellowish red (5YR 5/8) mottlings; medium granular structure; slightly friable when moist, and slightly hard when dry. Numerous roots are present in this layer. The boundary to the upper subsoil is clear and smooth. Rounded metamorphic pebbles and stones are numerous. It has a pH value of 6.3.
15– 30	Upper subsoil, clay loam; dark yellowish brown (10YR 4/4) when moist and yellowish brown (10YR 5/8) when dry, with reddish yellow (7.5YR 7/6) streaks; coarse granular structure; slightly friable when moist, slightly sticky and moderately plastic when wet and slightly hard when dry. The boundary to lower layer is smooth and gradual. Roots can easily penetrate this layer. Metamorphic pebbles and stones are present but lesser than that of the surface layer.
30– 70	Lower subsoil, clay loam; yellowish brown (10YR 5/8) when moist and brownish yellow (10YR 6/6) when dry; coarse granular structure; slightly sticky and moderately plastic when wet and slightly hard when dry. The boundary to substratum is smooth and clear. Very few roots can penetrate this layer. Metamorphic pebbles and sand are present. Limestone pebbles are also numerous in this layer.
70–150	Substratum, loam; brownish yellow (10YR 6/8) when moist and yellow (10YR 7/6) when dry; coarse granular structure; slightly friable when moist; non-sticky and moderately plastic when wet; and slightly hard when dry. Metamorphic sand and gravels are lesser compared to the upper horizon but limestone pebbles are numerous. Lower portion is mostly highly weathered shale, limestone and sandstone.

Odiongan clay loam (935).—This soil type occupies the undulating and strongly sloping areas from barrio Tulay to Dapauan and extending north to barrio Libertad adjoining the lowland areas and the hilly portion in the eastern section. It covers an area of about 3,953.1 hectares. Vegetation is composed mostly of permanent crops such as coconut, bananas and other fruit trees; shrubs and grasses predominantly cogon, which occupy the idle portion; and cultivated crops such as upland rice, corn, mungo, root crops and vegetables.

Fig. 8.—Typical landscape of Odiongan series.

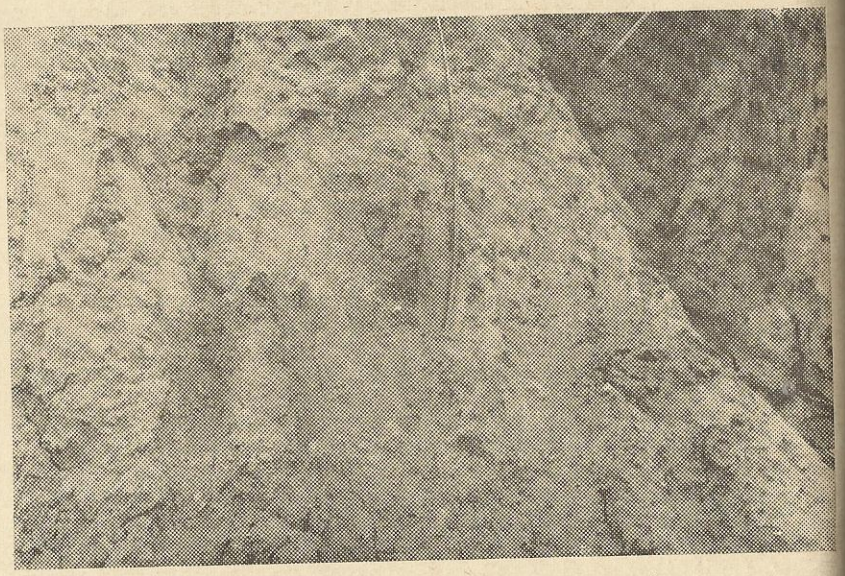

Fig. 9.—Typical profile of Odiongan series.

On account of its strongly sloping relief, the soil is subject to severe erosion if left unprotected. The land on the lower slopes can be cultivated occasionally to seasonal crops with proper safeguards. Contour tillage, green manuring and cover cropping are recommended to minimize soil erosion. Steeper slopes, on the other hand, should be utilized for permanent crops or trees. Cultivation of this portion of seasonal crops will cause severe washing down of the surface soil.

TUGUIS SERIES

Tuguis series was identified in barrio Tuguis in the municipality of Looc. It is a residual soil derived from the weathering of the underlying limy shale and sandstone. The relief is undulating to rolling and hilly. The external drainage is good while the internal drainage is poor. Limestone pebbles which produced a white powdery mass when crushed are found in the lower horizons. This soil series has some similarities to Bauang series differing from the latter only in the presence of pale brown (10YR 8/3) stones of different sizes and shape in the surface soil. The presence of these stones, however, does not interfere with the tillage operation in the area. A profile description follows:

Depth (cm.)	Characteristics
0– 20	Surface soil, clay; very dark brown (10YR 2/2) when moist and dark grayish brown (10YR 4/2) when dry; fine granular structure; sticky and plastic when wet and very hard when dry. Roots can easily penetrate this layer easily. The boundary to subsoil is gradual and wavy. The pH value is 5.8.
20– 70	Subsoil, clay; light yellowish brown (10YR 6/4) when moist and yellow (10YR 7/6) when dry; soft brownish yellow (10YR 7/8) concretions are present; fine granular structure; sticky and plastic when wet and very hard when dry. Boundary to substratum is abrupt and smooth.
70–150	Substratum, clay loam; olive yellow (5Y 6/6) when moist, coarse granular structure; slightly sticky and moderately plastic when wet and hard when dry. Lower portion is mostly highly weathered shale and sandstone. Few limestone pebbles are present which produce a white powdery mass when crushed.

Tuguis clay (936).—This soil type covers a wide area in Tablas Island. It is an upland soil mapped along the road from barrio Rizal in Odiongan to barrio Lemon Sur in Looc which extend to barrio Manlilico. It is also mapped in the upland areas of San Andres. It has a total area of about 10,484.7 hectares or 8.01 per cent of the total area of the province.

The principal crops grown are coconut, upland rice and corn. The secondary crops are bananas, fruit trees, root crops and vegetables. The vegetative cover of the uncultivated and idle sections are grasses and shrubs. Cogon and talahib are the native grasses predominating in the area. A portion covered by this soil type is utilized for pasture.

Soil erosion especially on areas tilled for row crops is the main problem on this soil type. Three types of erosion, namely; sheet, rill, and gully, occur on this soil type after a heavy rain as indicated by the presence of rivulets and small gullies running down the slopes. The area needs erosion control measures and other conservation practices to minimize soil wastage and improve the capacity of the soil to produce. Among the measures necessary are cover cropping, green manuring, contour tillage, and the like. Small gullies should be smoothened as soon as they occur in the fields.

LONOS SERIES

Lonos series was identified in Barrio Lonos, municipality of Romblon. It is a residual soil derived from the weathering of the underlying metamorphic rocks such as quartzite, schist, slate and marble. It occupies the southwestern portion of Romblon Island and the northeastern section of Tablas Island. The relief ranges from strongly sloping to hilly and mountainous. Rock outcrops are present in some portions. External drainage is good to excessive while internal is good. A profile description represented by Lonos sandy loam follows:

Depth (cm.)	Characteristics
0– 20	Surface soil, sandy loam; olive brown (5Y 4/4) when moist and pale yellow (5Y 7/4) when dry; very soft and friable when moist, non-sticky and non-plastic when wet, and soft when dry. Structure is coarse granular. Roots can easily penetrate this layer. The boundary to subsoil is abrupt and clear. Few metamorphic pebbles and stones are present in this layer. It has a pH value of 5.4.
20– 60	Subsoil, sandy clay loam; olive yellow (2.5Y 6/8) when moist and yellow (2.5Y 7/6) when dry; reddish yellow (7.5YR 7/6) streaks are present; coarse granular structure; soft and friable when moist, very slightly sticky and moderately plastic when wet, and slightly hard when dry. Very few roots are present in this layer. Metamorphic pebbles are present. Boundary to subsoil is clear and smooth.
60–150	Substratum, sandy clay loam; light yellowish brown (2.5Y 6/4) when moist and pale yellow (2.5Y 8/4) when dry; with numerous yellowish red (5YR 5/8) streaks; coarse granular structure; soft and friable when moist, slightly hard when dry. Numerous metamorphic sand and gravels are present in this layer. Lower portions are mostly highly weathered schist and slate.

Lonos sandy loam (937).—This soil type occupies the southeastern portion of Romblon Island. It covers about three-fifth of the island having an area of about 9,531.1 hectares. The relief is strongly sloping to hilly and mountainous. The surface soil is olive brown sandy loam, soft and friable which afford easy root penetration. The depth of the surface soil ranges from 15 to 20 centimeters. Below this layer to a depth of 60 centimeters is a coarse granular sandy clay loam.

The principal crop grown in the area is coconut. Upland rice, corn, root crops, fruit trees and vegetables cultivated mostly in patches are the secondary crops.

Lonos loam (938).—This soil type occupies the hilly and mountainous areas in the municipality of San Agustin which extend to barrio Carmen in the north. It covers an area of about 15,203.1 hectares. The surface soil is dark yellowish brown, friable loam. It has coarse granular structure which afford easy root penetration. The depth ranges from 20 to 25 centimeters. Stones and pebbles are sometimes present. Rock outcrop is also present in some places. The subsoil is coarse granular sandy clay loam. The depth is 70 centimeters from the surface. The substratum is coarse granular sandy clay loam underlain by highly weathered slate.

Coconut is the principal crop grown in this soil type. Secondary crops grown in patches of *kaingin* cultivation are upland rice, corn, root crops, bananas, and other fruit trees. Second growth forest occupies some portions in the interior.

SANTA FE SERIES

This series was identified in the municipality of Santa Fe, Romblon. It is a residual soil developed from the weathering of the underlying mixture of different rocks such as basalt, andesite, shale and sandstone. The description of this soil series has some similarities to the Caromatan series, differing from the latter only in the presence of some metamorphic stones in the surface and subsoils. The relief is strongly sloping to hilly and mountainous. Owing to its relief, both external and internal drainage is good to excessive.

The vegetative cover are of two types, namely; (1) cultivated crops such as coconut, upland rice, corn, bananas, root crops, and other fruit trees found mostly in the lower slopes, and (2) native vegetation mostly cogon and some *binayoyo* trees occupying the steeper slopes. Second growth forest also occupies a small portion in the interior. The profile description represented by the Santa Fe sandy loam follows:

Depth (cm.)	Characteristics
0– 20	Surface soil, sandy loam; olive gray (5Y 4/2) when moist and pale yellow (5Y 8/3) when dry; coarse granular structure; very friable when moist, and soft when dry. Roots can easily penetrate this layer. The

	boundary to subsoil is abrupt and irregular. Gravels and stones are sometimes present. Rock outcrop is found in some places. It has a pH value of 6.1.
20– 50	Subsoil, clay loam; olive yellow (5Y 6/8) coarse granular structure; slightly sticky and moderately plastic when wet, friable when moist. The boundary to substratum is clear and smooth. Gravel and stones are sometimes present.
50–150	Substratum, loam; yellow (10YR 8/8) granular structure. Lower portions are mostly highly weathered shale and sandstone, cubical to hexagonal in shape. Underneath are stratified layers of shale, sandstone and other igneous rocks.

Santa Fe sandy loam (940).—This soil type occupies the rolling and hilly areas along the vicinity of Santa Fe which extend to the municipality of Alcantara in the north and the whole Carabao Island at the southern tip of Santa Fe. It covers an aggregate area of about 10,928.0 hectares. The surface soil is sandy loam, olive gray, with coarse granular structure. It is very friable when moist and soft when dry. The subsoil is olive yellow clay loam, coarse granular and friable when moist and slightly sticky and moderately plastic when wet. The substratum is composed mostly of highly weathered shale, cubical to hexagonal in shape. This soil type is well drained externally and internally.

The principal crop is coconut. Upland rice, corn, root crops and other fruit trees are also grown in patches. The idle portions mostly covered with cogon are utilized as pasture.

Santa Fe loam (939).—This soil type covers the vicinity of barrio Guimbirayan, also in Santa Fe. The surface soil is loam, dark yellowish brown (10YR 4/4) when moist and very pale brown (10YR 7/3) when dry, coarse granular structure; soft and friable when moist and afford easy root penetration. The boundary to subsoil is abrupt and irregular. The subsoil is coarse granular clay loam. Highly weathered shale and sandstone composed the lower layer of the substratum. External and internal drainage are good to excessive. Rock outcrop is found in some places.

The principal crop grown is coconut. Secondary crops are upland rice, corn, root crops and fruit trees. This soil type covers an area of about 1,511.6 hectares. Generally, the area

covered by this soil type is not advisable for the cultivation of seasonal crops. Permanent crops like coconut and other fruit trees are best recommended. Frequent cultivation of this portion will enhance further destruction of the soil through erosion.

ESPAÑA SERIES

This soil series was identified in barrio España, municipality of San Fernando. It is a residual soil developed through the weathering of basalt and andesite. It has some similarities with the Luisiana series, differing from the latter only in the presence of some metamorphic pebbles in the surface and subsoils. The relief ranges from nearly level to hilly and mountainous. The external drainage is good to excessive while internal drainage is fair to good. The profile descriptions are as follows:

Depth (cm.)	Characteristics
0– 25	Surface soil, sandy clay loam; reddish brown (10YR 6/6) when moist and pale brown (10YR 7/4) when dry; with numerous red (2.5YR 5/8) streaks; coarse granular structure; slightly friable when moist, slightly sticky and moderately plastic when wet, and slightly hard when dry. The boundary to subsoil is smooth and abrupt. Few metamorphic sand and pebbles are present. Roots easily penetrate this layer. It has a pH value of 5.6.
25– 70	Subsoil, clay; reddish yellow (7.5YR 6/8) when moist, and yellow red (5YR 5/8) when dry; fine granular structure; sticky and plastic when wet and hard when dry. Roots can easily penetrate this layer. The boundary to substratum is clear and smooth. Few metamorphic sand are present in this layer.
70–150	Subsoil, clay; yellowish red (5YR 5/6) when moist and reddish yellow (5YR 6/6) when dry, with numerous yellowish red (5YR 5/8) streaks; fine granular structure; sticky and plastic when wet and hard when dry.

España sandy clay loam (941).—This soil type occupies the nearly level to rolling and hilly portion around barrio España which extend to Talaba River in the north. It covers an area of 5,359.3 hectares. The surface soil is reddish brown to pale brown coarse granular sandy clay loam. Below the surface soil is reddish yellow to yellowish red clay, fine granular

structure which afford easy root penetration. Metamorphic sand and pebbles are present. External drainage is good to excessive while internal drainage is fair to good.

Coconut is the principal crop grown. On nearly level areas, rice and corn are grown in patches. Local rice varieties are commonly used and the production ranges from 25 to 30 cavans of palay and 10 to 12 cavans of shelled corn per hectare according to information from farmers in the locality. The areas that are steeply rolling to hilly and mountainous are under secondary and/or primary forests.

España loam, stony phase (942).—This soil type is mapped along the road from barrio Taclobo to Talaba River in the municipality of San Fernando. It covers an area of about 2,062.5 hectares. The surface soil is reddish brown loam, granular structure and with numerous stones and boulders all over the surface. The presence of these stones and boulders make farming operations impractical in this soil type. The greater portion of this soil type is under shrubs and grasses. The area is utilized for pasture. However, portions that have less stones especially those near barrio Taclobo are planted to rice, corn and vegetables.

TUPI SERIES

Tupi series was first identified during the soil survey of Cotabato Province. It is a residual soil derived from the decomposition of the underlying basalt and andesites. The relief ranges from rolling to hilly and mountainous. Rock outcrops as influenced by volcanic ejecta are present.

The principal crop of this soil type is coconut. Secondary crops planted in patches of *kaingin* cultivation are rice, corn, root crops and other fruit trees. Second growth forest and primary forest occupy the steeper slopes in the interior. The area covered by this soil type is about 13,281.0 hectares.

Tupi loam (771).—The surface soil is loam; grayish brown (10YR 5/2) when dry and almost black (10YR 2/1) when wet; coarse granular structure; very friable when moist, non-sticky and non-plastic when wet. Roots can easily penetrate this layer. The boundary to subsoil is smooth and clear. Boulders are present. The depth ranges from 20 to 25 centimeters. It has a pH value of 5.5. The subsoil is yellowish brown (10YR 5/6) structureless fine sandy loam to fine sand.

The boundary to substratum is clear and smooth. The depth ranges from 65 to 70 centimeters from the surface. The substratum is light gray (2.5Y 7/2) coarse sand with gravels.

This soil type occupies the vicinities of barrio Cambijang, Sugod, Guinalas and Candayaga, all in the municipalities of Cajidiocan and San Fernando. It is also mapped at the western tip of Sibuyan Island along the vicinities of barrios Agtiwa, Tailan and Culongcolong and in the upper portion of barrio Silom. It covers an aggregate area of 13,281.0 hectares. External and internal drainage are good to excessive.

Coconut is the principal crop. Second growth and primary forests occupy the steeper slopes in the interior.

ZAMBOANGUITA SERIES

This soil series was first identified during the reconnaissance soil survey of Negros Oriental Province. The soil is of residual material derived from basalts. The relief is slightly rolling to strongly rolling.

Only one soil type is classified under the series.

Zamboanguita sandy loam (943).—The surface soil is sandy loam, grayish brown (2.5Y 5/2) when moist to black (2.5Y 2/0) when wet, coarse granular structure; friable when moist, slightly sticky and moderately plastic when wet. Boulders are present. The boundary to the upper subsoil is clear and smooth. The depth ranges from 20 to 30 centimeters. It has a pH value of 5.8.

The upper subsoil is clay reddish brown (5YR 4/4); granular structure, slightly friable when moist and slightly hard and compact when dry. Depth is 50 centimeters from the surface. Gravels are present. The boundary to the next layer is smooth and diffuse.

The lower subsoil is clay, reddish brown (5YR 4/4); slightly compact; massive; weathered basalts are present. Depth is 100 centimeters from the surface. Boundary to the substratum is clear and smooth.

The substratum is clay, yellowish red (5YR 5/6), compact. Boulders and stones are also present.

The soil type occupies the island of Banton and a portion in the vicinity of barrio Calatrava in San Andres. It covers a

total area of about 9,373.0 hectares. The relief ranges from slightly rolling to strongly rolling or hilly. External drainage is good to excessive while internal drainage is good.

Coconut is the principal crop grown. However, portions in the lower slopes are also utilized for rice, corn, vegetables and other fruit trees. Strongly rolling areas in the interior are covered with second growth forest.

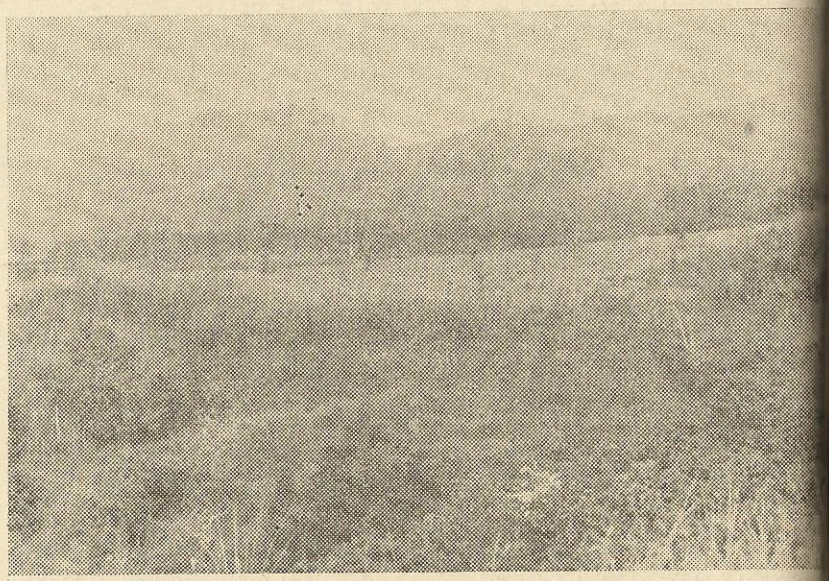

Fig. 10.—Typical landscape of Malalag-Faraon complex.

MALALAG-FARAON COMPLEX

The interior portion of Tablas Island which has a rugged to mountainous relief is classified as Malalag-Faraon complex. It is an association of the Malalag and Faraon soils in an intimate mixture that one cannot be mapped separately from the other with the scale used. Thus a complex name is given for the two soils. The soils of this complex were derived from the weathering of igneous, sedimentary and metamorphic rocks, most common of which are limestone, basalt, schist, slate and quartzite. The area is well drained both externally and internally. The area covered by this soil complex is approximately 8,843.6 hectares or 6.77 per cent of the total area of the province.

Malalag-Faraon complex (944).—Malalag soil is established during the reconnaissance soil survey of Davao Province. It is a primary soil developed from the weathering of metamorphic, igneous and shale rocks. The relief is hilly to mountainous. The area is mostly under second growth and primary forests.

The surface soil is loam, grayish brown (2.5YR 5/2) friable and granular structure. It is slightly hard when dry. Roots can easily penetrate this layer. The depth ranges from 10 to 15 centimeters.

The subsoil is light brown (7.5YR 6/4) clay loam; slightly compact and granular. The depth is 40 to 60 centimeters from the surface.

The substratum is composed mostly of massive rocks of schist, igneous and some calcareous shale.

Faraon soil is a residual soil derived from coralline limestone. It has a rolling to hilly relief. External drainage is excessive.

The surface soil is clay; dark gray (10YR 4/1); medium granular structure; slightly friable when moist, slightly sticky and plastic when wet and hard when dry. Limestone rocks are found in the surface as outcrops. The depth of the surface soil is 15 to 20 centimeters.

The subsoil is clay; light gray (7.5YR N7/) to dark gray (7.5YR N4/), slightly compact, coarse to moderately fine granular structure; sticky and plastic when wet and hard when dry. Weathered limestone rocks are present in this layer.

The substratum is mostly highly weathered limestone rocks.

The area covered by this soil complex has little agricultural value. It is occupied by second growth forest. *Kaingin* system of farming, however, is being done in patches along hillsides which exposed the area to severe erosion. As a result, some portions are found with exposed limestone, metamorphic and other igneous rocks. This soil complex is not recommended for the cultivation of seasonal crops. Portions which are bare of vegetative cover should be planted to permanent trees in order to prevent the excessive washing away of the soil. Cutting down of trees and the practice of *kaingin* farming should be discouraged.

TABLE 3.—*Key to the Soils of Romblon Province.*

Soil Mapping Number	Soil Mapping Unit	Parent Material	Relief	Drainage External	Drainage Internal	Present Vegetation/Use
945	Laylay sandy clay loam	Alluvium	Level	Poor	Poor	Lowland rice, coconut, corn, fruit trees and vegetables.
506	Mogpog clay loam	Alluvium	Nearly level	Poor	Poor	Lowland rice, corn, coconut, mungo, vegetables and fruit trees.
933	Mogpog sandy loam	Alluvium	Nearly level	Poor	Poor	Lowland rice, corn, coconut, mungo, vegetables, and fruit trees.
942	España loam, stony phase	Basalt and Andesite	Rolling to hilly with some level portions	Good to Excessive	Fair to good	Rice, corn, vegetables; grasses.
941	España sandy clay loam	Basalt and Andesite	Rolling to hilly with some level portions	Good to Excessive	Fair to good	Coconut, rice, and corn.
938	Lonos loam	Quartzite, schist, slate and marble	Rolling to hilly	Good to Excessive	Good	Coconut, rice, corn, banana, root crops, and fruit trees.
937	Lonos sandy loam	Quartzite, schist, slate and marble	Rolling to hilly	Good to Excessive	Good	Upland rice, corn, vegetables, root crops and fruit trees.
935	Odiongan clay loam	Shale, sandstone, limestone	Rolling to hilly	Excessive	Good	Corn, rice, mungo, vegetables, root crops coconut, banana, and fruit trees.
934	Romblon clay	Marble	Strongly rolling to hilly		Poor	Coconut, corn, rice, vegetables, root crops and fruit trees.
939	Santa Fe loam	Basalt, andesite shale and sandstone.	Rolling to hilly	Good to Excessive	Good to Excessive	Coconut, rice, corn, root crops and fruit trees.
940	Santa Fe sandy loam	Basalt, andesite shale and sandstone.	Rolling to hilly	Good to Excessive	Good to Excessive	Coconut, rice, corn, root crops and fruit trees.
936	Tuguis clay	Limy shale and sandstone	Rolling to hilly	Good	Poor	Coconut, upland rice, corn, banana, vegetables, root crops, and fruit trees.
771	Tupi loam	Basalt and andesite	Rolling to hilly	Good to Excessive	Good to Excessive	Coconut, primary and secondary forests.
943	Zamboanguita sandy loam	Basalt	Rolling to hilly	Good to Excessive	Good	Coconut, rice, corn, vegetables and fruit trees.
944	Malalag-Faraon complex	Limestone and metamorphic rocks.	Hilly and mountainous	Good to Excessive	Good	Primary and secondary forests.
118	Beach sand	—	Nearly level to undulating	Good	Good	Coconut.
	Hydrosol	—	Level	Poor	Very Poor	Nipa palm, mangrove and *bakauan*.
45	Mountain soils, undiffer-	—	Hilly to mountainous	—	—	Forest trees.

MISCELLANEOUS LAND TYPES

Lands that have little or no agricultural value are included in this group. They may have little or no definite soil characteristics or are inaccessible for a thorough examination of the soil. In Romblon Province, hydrosol, beach sand, and the mountain soils, undifferentiated, composed the miscellaneous land types. They cover an aggregate area of about 16,039.8 hectares or 11.8 per cent of the total area of the province.

Hydrosol (1).—The hydrosol areas are alluvial deposits which are under water most of the time. They are delineated along the mouths of rivers and streams and along the coasts of Tablas and Sibuyan Islands. The vegetative cover consists mostly of nipa palms, mangroves, and *bakauan*. The total area is about 600 hectares.

Hydrosol has no agricultural value. However, it is equally profitable when converted into fishpond. Nipa palms which are good sources of nipa leaves that are being made into nipa shingles for roofing materials, grow luxuriantly in this land type. *Bakauan* also abounds in this land type. Another important use of this land type is for wildlife preservation.

Beach sand (118).—This miscellaneous land type is mapped along the coastal shores of Odiongan, Tablas Island and in Azagra, Sibuyan Island. It is a narrow strip of land along the shore. The relief is nearly level to slightly undulating. The profile is undeveloped and consists of grayish brown sand. Both external and internal drainage are good. Coconut is the only crop planted in the area. It covers about 562.4 hectares.

Mountain soils, undifferentiated (45).—This miscellaneous land type occupies the hilly and mountainous area in Sibuyan Island. It is covered with thick growth of primary forest. The total area is about 14,877.4 hectares. The area is inaccessible and has less agricultural importance for the present, hence, it is classed under miscellaneous land type.

LAND-USE AND SOIL MANAGEMENT

The term "land-use" refers to the use of the land according to its capability such as crop land, pasture land or forest. While "soil management" includes all practices employed on the farm to improve the soil both chemically and physically

and maintain its productivity. Such practices may involve the use of one or more of the following: (1) fertilizers and lime, (2) cover and green manure crops, (3) conservation of crop residues and animal manures, (4) crop rotation (5) terracing, (6) strip cropping, and (7) contour tillage.

The province of Romblon is generally mountainous. The fast increasing population depends mostly from the soil for their means of livelihood. As a consequence, farming has extended to the steeper slopes and mountain sides in the interior.

The systems of farming employed in most lowland rice areas have greatly changed from the old antiquated methods to the improved farm practices. The change can be attributed to the assignment of government workers under the DANR in the province working hand-in-hand to convince farmers that practices such as straight planting, clean culture, fertilizer application, use of improved seeds and control of pests and diseases will improve crop yield and raise the standard of living in the rural areas. However, some farmers who cannot afford the cost of employing these modern farming practices still follow the old system of farming inherited from their ancestors.

In the uplands, hills and mountains, soil erosion is the most important problem to be considered. This is especially true in the islands of Tablas and Romblon where some areas are almost bare of vegetative cover. Although some farmers employ advanced methods of farming in the lowland areas, very few of them take cognizance of the importance of the soils in the uplands and hills from erosion. Cover cropping is practiced by few farmers in Looc and Odiongan. Contour farming is seldom practiced by farmers in the province. Other conservation measures such as terracing and strip cropping are not done by the farmers. On account of the limited areas for cultivated crops, farmers extend their farming operations in the higher slopes and mountain sides. They clear the forest and plant the *kaingin* clearings. This system of farming causes great damage to the soil as well as to its forest cover, hence, *kaingin* system of farming should be discouraged.

WATER CONTROL ON THE LAND

Water control as applied in the province of Romblon concerns mostly of two types, namely (1) control of excess water

in the lowland areas during rainy season, and (2) conservation of moisture on the uplands, hills and mountains devoted to agriculture during the dry months. In the case of the Moppog clay loam, water easily accumulates on the surface of rice paddies on account of its poor internal drainage. In most areas, irrigation water is usually a continuous flow especially during rainy season. Drainage of excess water on the rice paddies during planting time is sometimes a problem to some of the farmers. Construction of irrigation and drainage canals is very necessary for an effective control of irrigation water.

The system of irrigating lowland rice in the province is mostly by gravity. There is no irrigation pump operated either by government or private entity.

One common problem in the province especially in the island of Sibuyan is flood that overflows the banks of most rivers and creeks during a heavy rain. Mountain ridges are so narrow and steep that water runoff easily accumulates and causes flood. As a result, stream bank erosion takes place which causes the widening of some rivers and creeks.

Water is essential for plant growth so that steps should be taken to prevent its loss. During droughty months, conservation of moisture is necessary for the use of plants. Impounding water on earthen dam for use during dry months will afford most farmers a double cropping of lowland rice. Areas bare of vegetative cover should be planted to cover crops or permanent trees. This cover crops will not only conserve moisture, but will also prevent erosion and increase soil fertility. Improving the physical condition of the soil will also increase its moisture holding capacity, thus prevent soil from being washed away during rainy season.

PRODUCTIVITY RATINGS OF THE SOILS OF ROMBLON PROVINCE

The productivity of a soil is its capacity to produce a specified crop or sequence of crops under a specified system of management. In this report, productivity rating is based on the average crop yield of a soil type in relation to national standards established. The yield is being obtained without the use of fertilizer or soil amendments. Yield predictions are arrived at in two principal ways, namely (1) through judgments based upon evidence afforded by actual yield data from

sample areas of the soil mapping units, and (2) through judgments based on comparisons of the characteristics of soils and basic knowledge of plant requirements.

Table 4 indicates the productivity ratings of the soils for the major crops grown in Romblon Province. The productivity ratings are developed mainly from estimates based upon observations and interviews supplemented by a few records and census data. The soil productivity rating or index for a given crop is expressed in terms of a standard index of 100. Thus, a productivity rating of 75 for a certain crop means that a soil is about three-fourth as productive relative to the national standard, or in terms of production, the soil can produce 45 cavans of palay of lowland rice where the national standard is 60 cavans of palay.

TABLE 4.—*Productivity ratings of the soils of Romblon.*[1]

Soil Type	Crop Productivity Index for[2]						
	Coconut 100=3,750 nuts	Lowland rice 100=60 cavans	Upland rice 100=20 cavans	Corn 100=17 cavans	Camote 100=8 tons	Cassava 100=15 tons	Banana 100=900 bunches
Lavlay sandy clay loam (945)	100	65	---	60	---	---	80
Mogpog clay loam (506)	100	95	---	70	---	---	120
Mogpog sandy loam (933)	90	70	---	60	---	---	70
España loam, stony phase (942)	40	---	30	30	50	50	60
España sandy clay loam (941)	50	---	60	70	70	70	80
Lonos loam (938)	80	---	60	50	70	70	80
Lonos sandy loam (937)	70	---	50	40	80	70	80
Odiongan clay loam (935)	108	---	70	80	90	80	90
Romblon clay (934)	70	---	50	40	70	60	70
Santa Fe loam (939)	60	---	50	40	60	60	70
Santa Fe sandy loam (940)	50	---	40	40	50	50	60
Tuguis clay (936)	112	---	80	90	100	90	100
Tupi loam (771)	110	---	50	50	60	60	70
Zamboanguita sandy loam (943)	90	---	70	60	70	70	90
Beach sand (118)	70	---	---	---	---	---	70

[1] Data on production of different crops are based on data furnished by farmers and agricultural extension workers.
[2] Indices are approximate average yields of the most productive soils in the Philippines.

TEXTURAL CLASSES OF THE SOILS OF ROMBLON PROVINCE

FIELD DETERMINATION OF SOIL TEXTURAL CLASS

The determination of the soil textural class is made in the field mainly by feeling the soil with the fingers. While this

requires skill and experience, accuracy can be had if the field scientist frequently checks his field textural classification against laboratory results.

Hereunder are definitions and descriptions of the basic soil textural classes in terms of field determination.

Sand.—Sand is loose and single-grained. The individual grains can readily be seen or felt. Squeezed in the hand when dry, individual particles will fall apart when the pressure is released. Squeezed when moist, the particles will form a cast, but will crumble when touched.

Sandy loam. Sandy loam contains much sand with enough silt and clay to make it somewhat coherent. The individual sand grains can be readily seen or felt. Squeezed when dry, the soil particles will form a cast which readily falls apart, but if squeezed when moist, a cast can be formed which will bear careful handling without breaking.

Loam.—Loam consists of relatively even mixture of different grades of sand, silt, and clay. It is mellow with a somewhat gritty feel, yet fairly smooth and slightly plastic. Squeezed when dry, the soil particles will form a cast that will bear careful handling, while the cast formed by squeezing the moist soil can be handled quite freely without breaking.

Silt loam.—Silt loam contains a moderate amount of the fine grades of sand and only a small amount of clay, over half of the particles being of the soil separate called "silt." When dry it may appear cloddy but the lumps can be readily broken, and when pulverized it feels soft and floury. When wet the soil readily runs together and puddles. Either dry or moist, the soil particles will form into a cast which can be freely handled without breaking. When moistened and squeezed between the fingers, it will not "ribbon" but will give a broken appearance.

Clay loam.—Clay loam is a fine-textured soil which usually breaks into clods or lumps that are hard when dry. When moist soil is pinched between the thumb and fingers, it will form a thin "ribbon" which breaks readily, barely sustaining its own weight. The moist soil is plastic and can be formed into a cast that will bear much handling. When kneaded in the hand it does not crumble readily but tends to form into a heavy compact mass.

Clay.—Clay is a fine-textured soil that usually forms very hard lumps or clods when dry, and is quite plastic and usually sticky when wet. When the moist soil is pinched between the thumb and fingers, it will form into a long, flexible "ribbon." Some fine clays very high in colloids are friable and lack plasticity under all conditions of moisture.

TABLE 5.—*Mechanical analysis of the surface soils of the different soil types in Romblon Province using the modified Bouyoucos method.*

Soil Mapping Number	Soil Mapping Unit	% Sand (2.0–0.05 mm.)	% Silt (0.05–0.002 mm.)	% Clay (below 0.002 mm.)
945	Laylay sandy clay loam	46.0	24.8	29.2
506	Mogpog clay loam	26.2	40.6	33.2
933	Mogpog sandy loam	56.4	30.8	12.8
942	Espana loam, stony phase	49.4	33.8	16.8
941	Espana sandy clay loam	46.0	23.4	30.6
938	Lonos loam	46.8	30.6	22.6
937	Lonos sandy loam	55.4	25.8	18.8
944	Malalag-Faraon complex	50.4	33.8	15.8
935	Odiongan clay loam	29.2	35.6	35.2
934	Romblon clay	31.4	26.8	41.8
939	Santa Fe loam	41.4	38.4	20.2
940	Santa Fe sandy loam	61.8	24.6	13.6
936	Tuguis clay	21.2	34.6	44.2
771	Tupi loam	50.0	36.8	13.2
943	Zamboanguita sandy loam	73.8	15.0	11.2

MECHANICAL ANALYSIS

Accuracy in the determination of textural classes of soils delineated during the soil survey is attained through mechanical analysis. Generally, field cassifications coincide with the results of the mechanical analysis. However, there are instances when field clasifications and laboratory classifications vary. Some soils exhibit clayey textures in the field. They are sticky and plastic when wet, hard and brittle when dry, but actually when analyzed, their clay contents are low. Under these circumstances, the field classifications are maintained except when their clay contents are so low that their final textural classifications are those established by the laboratory.

The soil separates are sand, silt, and clay. Sand includes particles from 2.0 millimeters to 0.05 millimeters in diameter, silt from 0.05 to 0.002 millimeters; and clay particles smaller

than 0.002 millimeters in diameter.[1] Particles larger than 2.0 millimeters such as gravels, pebbles, and cobbles are considered coarse skeleton. Class names such as sand, silt, silt loam, clay loam, clay, sandy loam, etc. are determined by the proportionate amount of the different separates present in the soil. A soil with an analysis of 30 per cent or more of clay fraction is considered a clay soil. Lately, however, this percentage was changed to 40, so that all soils containing 40 per cent or more of clay are classified as clay soils.

The modified Bouyoucos method was employed in the mechanical analysis wherein the conventional jar, hydrometer, and thermometer were used. Analysis was made without removing the organic matter from the soil.

LAND CAPABILITY CLASSIFICATION AND CONSERVATION GUIDE FOR THE SOILS ROMBLON

Land capability classification is a scheme of grouping soil types together for their proper utilization. Utilization, from the standpoint of agricultural as well as economic capabilities, implies any of or a combination of four general purposes, namely: (1) cropland, (2) pasture land, (3) forest land, and (4) land for wildlife or recreation. For cropping purposes the crop or set of crops are usually specified and the corresponding necessary soil management practices together with the supporting soil conservation measures are given.

The three major factors to consider in land capability classification are (1) the soil type, (2) the slope of the land, and (3) the degree of erosion. In the consideration of a given soil type, its physical and chemical properties, both of which consist of inherent and acquired characteristics, are fully evaluated in the field and in the laboratory. Land capability classes are further subdivided into subclasses by taking into account different soil problems. In the Philippines, the three major problems on soils are (a) erosion and runoff, (b) wetness and drainage, and (c) root zone and tillage limitations, such as shallowness, stoniness, droughtiness, and salinity. The subclasses are indicated by "e" for erosion and runoff; by "w" for wetness and drainage; and by "s" for root zone and tillage limitations.

[1] Previous to 1938, United States Department of

The different land capability classes are as follows:

CLASS A—Very good land; can be cultivated safely; requires only simple but good farm management practices.

CLASS B—Good land; can be cultivated safely; requires easily applied conservation practices.

CLASS C—Moderately good land; must be cultivated with caution; requires careful management and intensive conservation practices.

CLASS D—Fairly good land; must be cultivated with extra caution; requires careful management and complex conservation practices. Best suited to pasture or forest.

CLASS L—Level to nearly level land; too stony or very wet for cultivation. Suited to pasture or forest with good soil management.

CLASS M—Steep, very severely to excessively eroded or shallow for cultivation. Suited to pasture or forest with careful management.

CLASS N—Very steep, excessively eroded, shallow, rough, or dry for cultivation. Suited to pasture with very careful management and definite restrictions. Best suited to forest with very careful management.

CLASS X—Level land, wet most of the time, cannot be economically drained. Suited for farm ponds or for recreation.

CLASS Y—Very hilly and mountainous, barren and rugged. Should be reserved for recreation and wildlife.

LAND CAPABILITY CLASS B, SUBCLASS Bw

Nearly level, occurs in depressions. Occasional overflow is the problem. Requires protection from overflow. Observe easily applied conservation practices.

MOGPOG CLAY LOAM

Subclass Bw land is nearly level and occurs in depressions near large streams or on low bottom lands. Included under this subclass are wet lands that can be easily drained and those with a high water table. The soil is deep; the subsoil is heavy.

Poor external and internal drainage require some means to drain the excess water. Furthermore the area is subjected to occasional overflow.

Lowland rice is especially suited to this land. When properly drained, corn, sugar cane, legumes, and other row crops common in the area may be grown.

Protection from occasional overflow of nearby streams may be needed. Diversion ditches should be constructed for run-off coming from adjoining uplands. When drained and cultivated, lime and the right kind and quantity of fertilizer should be applied. The planting of soil-improving crops and the use of farm manure and compost must be observed.

LAND CAPABILITY CLASS B, SUBCLASS Bs

Nearly level. Low fertility, shallowness, droughtiness, slight alkalinity or salinity is/are the problems. Adopt special soil management practices and observe easily applied conservation practices.

Laylay sandy clay loam
Mogpog sandy loam

Subclass Bs is nearly level land with sandy loam or light textured subsoils.

This subclass is potentially good land but the soil is inherently low in fertility and its porous subsoil allows water to percolate rapidly thus making it somewhat droughty. Moreover, fertility loss through leaching is relatively high.

Fruit trees, vegetables, and other truck and special crops are best adapted to this land.

Special soil management practices and the observance of easily applied conservation practices are necessary. To enhance and maintain productivity the plant nutrient and organic matter contents of the soil should be always at their highest possible level. This means using a system of crop rotation which must include a legume at least once in every three or four years, the addition of farm manure or compost, and the application of mineral fertilizers. Increasing the organic matter content of the soil increases its water-holding capacity and also improves its tilth and fertility. Supplemental irrigation may be needed during the dry season for best growth of all crops.

LAND CAPABILITY CLASS C, SUBCLASS Ce

Moderately sloping, moderately to severely eroded. Erosion and fertility are the main problems. Observe erosion control measures, careful management and intensive conservation practices.

España loam, stony phase
España sandy clay loam
Odiongan clay loam
Tuguis clay
Zamboanguita sandy loam

Subclass Ce land is moderately sloping and is moderately to severely eroded. Its effective depth may extend to 90 centimeters or more.

The slope which ranges from 8 to 15 per cent accelerates erosion. In turn erosion depletes fertility.

Primarily, for this subclass a good cropping system should be planned. The crops grown and tillage methods affect soil conditions, and consequently runoff and soil erosion. Different combinations of erosion-prevention and water-control practices should be chosen with the crops to be grown. In general, crops common in the area as well as fruit trees could be cultivated. Close-growing crops with a legume in the rotation should be supported by practices that control runoff and minimize erosion the most important of which are contour tillage, strip cropping, cover cropping, grassed waterways, and terracing. In addition lime and fertilizer according to needs, should be applied; compost and farm manure should be incorporated into the soil; and green manuring must be observed regularly.

Land Capability Class D, Subclass De

Strongly sloping, severely to very severely eroded. Erosion and fertility are the main problems and the number of years for cultivation limited. Observe erosion control measures; very careful soil management specially good crop rotation, and complex conservation practices if land is to be cultivated. Suited for pasture or forest.

España sandy clay loam
Lonos loam
Lonos sandy loam
Odiongan clay loam
Sta. Fe loam
Sta. Fe sandy loam
Tuguis clay
Tupi loam
Zamboanguita sandy loam

Subclass De is strongly sloping and is severely to very severely eroded land. The topsoil is generally thin; the subsoil is usually heavy and slowly permeable.

The slope, which ranges from 15 to 25 per cent, and the heavy and slowly permeable subsoil induce moderate to excessive runoff. Consequently the danger of soil erosion is increased. The topsoil being thin, accelerated erosion on this land will be very critical both on the standpoint of effective soil depth and fertility. The lack of soil depth for good root penetration and water intake and storage are added problems to cope with.

To farm this land safely very careful and good soil management practices should be observed. Subclass De land has definite restrictions and the choice of use is reduced. Planting of row crops is not advisable. When close growing crops are planted a well planned rotation should be followed, planting should be along the contour, and before full growth is attained by the plants mulching is necessary. On the higher slopes a system of properly laid out terraces should be constructed with suitable outlets installed in the absence of natural outlets. Terrace outlets must have vegetative cover, preferably grass, at all times. If grass is not well established, reseeding and fertilizing should be done. All hazards induced by tillage and runoff should be properly appraised and supporting conservation practices instituted accordingly.

When used for orchards contour planting should be observed and a good stand of leguminous cover crop should be maintained. Deep-rooted legumes improve subsoil structure. They keep the subsoil porous for water, roots, and air to get through readily.

Where erosion on a moderately deep soil is not severe, gullies should be smoothened and then seeded to grass or legumes. The soil should be limed and fertilized to give the grass or legume a good start; the legume seeds will need inoculation.

It is best suited to pasture or forest.

Land Capability Class D, Subclass Ds

Nearly level to gently sloping, slightly eroded. Very low fertility, very rapid permeability and low moisture holding capacity, strongly alkaline or high salt content, formation of dunes is/are the problem/s. Adopt special soil management practices and observe complex conservation practices if land is to be cultivated.

Beach sand

Subclass Ds is nearly level to gently sloping land and is slightly eroded. The surface soil is shallow with sandy to loamy texture; the subsoil is highly permeable.

Relatively, subclass Ds land may be less sloping than subclass Cs land, but for root zone and tillage limitations, the former has more acute problems than the latter. Thus, Ds land is comparatively of lower fertility, or has a more rapid

permeability and lower moisture holding capacity, or has a higher salt content than Cs land. Moreover, the formation of dunes through wind action is more likely to happen on land under subclass Ds.

If planted to clean culture crops soil under this subclass require intensive conservation measures. This subclass may be devoted to vegetables or to truck farming and to root crops provided water supply is adequate and additional measures are taken to increase the water holding capacity of the soil.

Increasing the organic matter content of the soil by the application of compost and farm manure and the observance of green manuring are necessary. Other vegetative soil conservation measures to be instituted in conjunction with clean culture cultivation are contour and buffer strip cropping, cover cropping and mulching. Where sand dunes are likely to form vegetative and mechanical means to stabilize the shifting sand must be adopted.

It is not likely that soils under this subclass will need any lime but should it be deemed necessary, lime may be added only after the soil is analyzed. Commercial fertilizers needed would be more of nitrogenous fertilizer for leafy vegetables and ammonium phosphate or complete fertilizers, as soil analysis may show, for the fruiting vegetables.

Land Capability Class M

Steep, very severely to excessively eroded, or shallow for cultivation. Suited to pasture or forest with careful management.

Lonos loam
Lonos sandy loam
Romblon clay
Sta. Fe loam
Sta. Fe sandy loam
Tupi loam
Zamboanguita sandy loam

Class M is steep and is very severely to excessively eroded, or shallow land. Stones or gravels may be present.

The slope, which ranges from 25 to 40 per cent, and the generally shallow soil make this land unfit for seasonal cultivation. Where climatic conditions are favorable orchards of citrus, coffee, etc., may be developed provided the trees are planted along the contour and a good cover crop is raised to prevent soil erosion.

Land under this capability class is best suited to pasture or forest. When devoted to pasture careful management should be observed. To grow legumes or grass for grazing the soil should be well prepared. Lime and fertilizers, as needed, should be applied to give the young legumes or grass a good start. Newly developed pastures should not be grazed heavily; the use of those already established should be controlled and rotated. Stock ponds should be constructed wherever possible. Diversion terraces around the heads of active gullies should be installed. Gullies that are about to develop should be smoothened and sodded.

For forest purposes, trees should be protected from fires; *kaingin* cultivation must be prevented; bare spaces should be planted to trees like *ipil-ipil*.

Land Capability Class N

Very steep, excessively eroded, shallow, rough or dry for cultivation. Suited to pasture with very careful management and definite restrictions. Best suited to forest with very careful management and restrictions.

Romblon clay
Mountain soils, undifferentiated
Malalag-Faraon complex

Class N is very steep and is excessively eroded land. The soil is very shallow and dry; the land is rugged and broken by many large gullies.

The slope, which is 40 per cent or over, and excessive erosion make this land not suitable for cultivation.

Land under this capability class could be utilized for pasture provided very careful management is observed and definite restrictions imposed. Where grasses grow, grazing must be controlled or restricted to a few heads of animals per hectare and grazing areas rotated regularly. The pasture will need liberal application of fertilizers and lime; reseeding is necessary.

This land is best suited to forest. However, very careful management and restrictions must be observed. The establishment of permanent vegetation, like *ipil-ipil*, is recommended especially in gullied places. *Kaingin* farming must be stopped by all means.

Land Capability Class X

Level land; wet most of the time and cannot be economically drained. Can be used for farm ponds or for recreation.

Hydrosol

Class X is level or slightly depressed land and because of its location and elevation sea water or fresh water finds passage into the area. In some places the water may flow or drain back to its source with the receding tide while in others the water stagnates. Lands along the shore or very near the sea and at the mouths of rivers and creeks which are accessible to sea water are usually covered by mangroves or nipa palms. Inland areas occupied by fresh water, on the other hand, are covered by grasses. In general, land covered by sea or fresh water part or most of the time is known as a hydrosol area.

This land is suitable for salt beds, fishponds, farm ponds, or recreation as the case maybe.

TABLE 6.—*Land capability classes/subclasses of the different soils of Romblon Province.*

Soil Mapping Number	Soil Mapping Unit	Possible Soil Unit[1] (Slope-Erosion Class)	Capability Class/subclasses
506	Mogpog clay loam	a-0	Bw
945	Laylay sandy clay loam	a-0	Bs
933	Mogpog sandy loam		
942	España loam, stony phase	b-2	Ce
941	España sandy clay loam	c-2	De
938	Lonos loam	d-2	
937	Lonos sandy loam		
935	Odiongan clay loam		
939	Sta. Fe loam		
940	Sta. Fe sandy loam		
936	Tuguis clay		
771	Tupi loam		
943	Zamboanguita sandy loam		
118	Beach sand	a-0	Ds
934	Romblon clay	a-3	M
		e-3	N
45	Mountain soils, undifferentiated	----------	N
944	Malalag-Faraon complex		
1	Hydrosol	a-0	X

[1] The slope-erosion units are the possible conditions that may exist in each soil type. Any other unit with an erosion class more than the one specified above will be classed under the next capability class. Thus, Tuguis clay with a c-2 slope-erosion class has a Ce land capability subclass. The same soil type with a c-3 slope-erosion class has a De land capability subclass.

In the construction of fishponds or salt beds the trees and palms are cut except a strip along the shore line wide enough to protect the site from the souring action of waves. For fishponds the site should be dug no less than a meter deep. Afterwards, the water should be fertilized to produce a good growth of algae, the food for most fish.

II. SOIL EROSION SURVEY

INTRODUCTION

A reconnaissance soil erosion survey of Romblon was con ducted simultaneously with the reconnaissance soil classifica tion of the province. The purpose of the survey is to asses or determine (1) the extent of soil types of the province, (2) the cause or causes affecting erosion, (3) its effects on agri culture, and finally, (4) to suggest possible means to chec or minimize soil wastage.

Soil erosion begins when man first clear and cultivate th land. When it rains, water runoff is formed in the cultivate undulating fields carrying away particles of soil down to th streams, creeks, rivers and ultimately to the sea. Thus, wate is considered as principal agent of soil erosion.

SOIL EROSION DEFINED

Soil erosion is defined as the process of soil detachment an transportation by either wind or water. There are two kind of erosion, namely, normal or geologic and accelerated erosion

Normal or geologic erosion.—Normal or geologic erosio takes place in a natural or undisturbed condition under th canopy of forest, grass, ground litter, and in undergroun network of binding roots. Geologic erosion is a slow process the removal of the soil by either water or wind is balance by the formation of soil from the parent material underneath This kind of erosion is beneficial in the sense that there is constant renewal of the fertility of the soil.

Accelerated erosion.—Accelerated erosion is the proces brought about by man's activities on the land, thereby dis turbing the equilibrium between soil building and soil removal This kind of erosion is destructive as it removes soil par ticles very much faster than the formation of soils from th material underneath. The loss of the surface soil whic contains most of the fertility means also the decline in cro yields. Soil erosion in the Philippines is caused mainly b water. The different kinds of accelerated soil erosion are sheet, rill, gully, and stream bank erosion.

Sheet erosion.—This is the washing away of the upper part of the soil in a more or less uniform depth in the croplands. It occurs when farmers cultivate their sloping lands without employing any means of controlling the flow of the surface water or runoff. At the beginning, this kind of erosion is slow and is not noticeable but is most destructive.

Rill erosion.—This kind of erosion is the washing off of the soil by the formation of tiny incisions of a few inches depth and width which run down the slopes of an unprotected cultivated land. This is attributed to the method of planning and arranging the furrows along the slope of the land. Such rills may be erased by ordinary plowing. If uncheck, this type of erosion marks the beginning of the formation of gully erosion.

Gully erosion.—This kind of erosion occurs on paths of concentrated runoff down a slope and the cutting of deep narrow strips on the surface of the land. Gullies occur both on alluvial plains as well as on uplands. On a plain where drainage outlets are not protected, the edges of the plain are gradually eroded which consequently form into deep vertical cuts. These gullies, if not checked gradually destroy the plain. On uplands, gullying occurs mostly on slopes where runoff continually drain. This happens when farmers plow their fields up and down the slopes. Some gullies are small, but others are so big that farm animals cannot cross. Gullies grow bigger each year if not smoothened at the beginning.

Stream bank erosion.—This kind of erosion occurs along the banks of streams and rivers. It is very destructive particularly on such lands where the substrata are coarse or medium-textured. The flowing water undermines the lower part of the river or stream bank particularly along its outer curve thus causing the upper part to fall by its own weight.

METHODS OF SOIL EROSION SURVEY USED

The primary purpose of the soil erosion survey is to determine the degree of erosion in the different soils of the province, that is, the extent to which removal of the surface soil or subsoil has progressed as well as the amount of gullying with special reference to its effects on the cultivation of the land.

The present depths of the different soil types under cultivation in the province were compared to the depths of the virgin soils or soils with normal profiles. The depths of the different soils with normal profiles were established after various determinations over a wide area by boring with the soil auger, studying road cuts, pits, open wells, and stream banks.

Variations in the depth of soil as caused by erosion together with the presence of gullies are considered in mapping the different erosion classes. The depth and frequency of occurrence of gullies are noted as these affect the cultivation of the land. The classification of the different degrees of soil erosion used in the survey are as follows:

Erosion Class	Degree of Erosion	Description
0	No apparent erosion; no gullies	No apparent erosion; no gullies
1	Slight erosion	Less than 1/4 of original surface soil eroded; occasional crossable gullies present.
2	Moderate erosion	From 1/4 to 3/4 of original surface soil eroded.
3	Severe erosion	From 3/4 of original surface soil to 1/4 of subsoil eroded.
4	Very severe erosion	All of the surface soil to 3/4 of the subsoil eroded.
5	Excessive erosion	All of the surface soil and over 3/4 of subsoil eroded.
W	Normal erosion	Balance between soil erosion and soil formation is maintained.
—	Erosion, undifferentiated	Erosion conditions change as often as floods occur.

The extent as well as the degree of soil erosion will increase each year unless control measures are instituted and practiced.

EXTENT OF SOIL EROSION

The relief of Romblon Province is generally rolling, hilly and mountainous. On account of the limited lowland areas for cultivated crops, farmers have extended their farm operations to the higher slopes and mountainsides without practicing erosion control measures. As a result, excessive washing away of the soil has taken place in some areas to the extent that more than 3/4 of the subsoil has been carried away by runoff. The extent of erosion in the different areas are indicated more

clearly in the accompanying soil erosion map. As shown in Table 7, out of the total area surveyed, about 11,968.7 hectares or 8.8 per cent have no apparent erosion. Slight erosion wherein less than 1/4 of the original surface soil has been eroded has affected about 6,093.1 hectares, or 4.5 per cent of the total area surveyed. Moderate erosion which removed about 1/4 to less than 3/4 of the original surface soil has affected about 19,890.6 hectares or 14.6 per cent of the total area surveyed. About 79,374.6 hectares or 58.6 per cent have been severely eroded to such an extent that all of the surface soils and about 1/2 to 3/4 of the subsoil have been removed. Gullies are apparent in some places. Erosion on the mountain soils, undifferentiated which are thickly forested is considered normal, that is, the soil removal is balanced by the soil formation from the parent materials underneath. This type of erosion covers about 15,937.0 hectares or 11.7 per cent of the total area of the province.

TABLE 7.—*Character and extent of soil erosion, depth of soil loss, area and per cent of the different erosion classes in Romblon Province.*

Erosion Class	Degree of Erosion	Average depth of surface soil of virgin lands in cm.	Average depth of surface soil on cropland in cm.	Depth of soil loss in cm.	Average amount of original surface soil washed	Area (Ha.)	Per Cent
0	No apparent erosion	30	30	0	0	11,968.7	8.8
1	Slight erosion	30	25	5	Less than 1/4	6,093.1	4.5
2	Moderate erosion	25	13	12	From 1/4 to 3/4	19,890.6	14.6
3	Severe erosion	20	5	15	From 3/4 and over	60,577.8	44.7
4	Very severe erosion	15	0	15	All surface soil	18,796.8	13.9
5	Excessive erosion	15	0	15	All surface soil		
W	Normal erosion		×		Soil erosion is balanced by soil formation.	15,937.0	11.7
	Unclassified					2,329.0	1.8
	Total					135,593.0	100.0

FACTORS AFFECTING SOIL EROSION

Soil erosion occurs when water runs over the surface of a sloping unprotected land. This water running over the surface is called runoff. The rate of soil erosion will depend upon the velocity of surface runoff. The volume of runoff as well as its speed depends upon the soil type, slope of the land, vegetative cover, and intensity of rainfall in the area.

SOIL

The soil possesses certain physical characteristics which influence its erodibility. Under similar conditions of climate, relief and vegetative cover, there are marked differences in the erodibility of different soils. In some cases, sandy loam soils are more susceptible to erosion than clay loam soils.

Porosity and permeability are important factors in the formation of runoff. The higher the absorbing quality of the soil or infiltration of water into the soil, the less runoff will be formed. Different soil types differ in porosity and permeability. Also soils rich in organic matter are porous and will absorb more water readily than those poor in it.

SLOPE

Slope has a great influence in soil erosion. Runoff flows faster on a steeper slope than on one with a lesser grade. Taking other erosion factors equal, soil loss is greatest where runoff is fastest. Furthermore, on farm lands with the same grades of slopes one with a longer slope will erode more than one with shorter slope. This is so because as runoff acquires momentum, its cutting power as well as the soil carrying capacity is increased considerably. A slope unprotected by vegetation or some mechanical devices to decrease the velocity of runoff suffers heavily during a heavy rainfall.

VEGETATION

The vegetative cover of an area contributes much to its resistance to erosion. In the heavily wooded portions, the rate of soil loss is balanced by the formation of soil underneath. On cultivated farms, the crops offer very little protection from soil erosion. Crops that cover the ground well give more protection than clean tilled row crops. Land on slopes which is bare of vegetative cover suffers heavily from soil erosion.

INTENSITY OF RAINFALL

Rainfall intensity is a factor in soil erosion. A region with a uniform distribution of rainfall throughout the year will have less soil erosion than an area where the same amount of rainfall occurs in a shorter period. In the former area, enough time is given for the water to infiltrate into the soil, while in the case of the latter, the intensity of rainfall is great, hence

the amount of runoff which cause soil erosion is correspondingly greater.

Fig. 11.—*Kaingin* system of farming contributed much to soil erosion in the province.

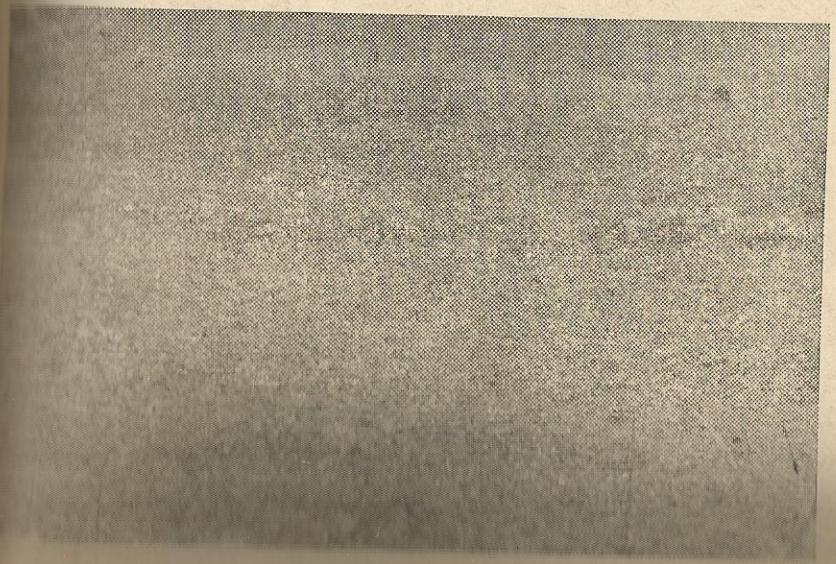

Fig. 12.—A bare land which typifies the physical effect of soil erosion.

FACTORS PROMOTING SOIL EROSION

System of farming.—In the province of Romblon, most of the farms are rolling and hilly as coastal plains and valleys are few and narrow. These are planted to upland rice, corn, root crops which are mostly erosion-promoting crops. Erosion is aggravated further by the common practice of plowing up and down and the slopes. No means of protection is being employed in farming these sloping lands.

Crop rotation in the province is seldom practiced. Rice and corn are planted on the same farm year after year. A well planned system of crop rotation with a legume crop should be done in order to improve the physical condition of the soil and thereby, minimize soil erosion.

Kaingin system of farming.—This is another factor that contributes to the destruction of soil and forest resources. *Kaingin* clearings are usually made on steep slopes. The trees and other vegetations are cut down and burned leaving the area entirely bare. When it rains, runoff is formed which carries down considerable amount of surface soil. As a result, rills and sometimes gullies are formed after a heavy rain.

EROSION IN THE DIFFERENT AREAS

As discussed in the first part of this report, the soils of Romblon Province are grouped into three types, namely (1) soils of the plain, (2) soils of the upland, hills and mountains, and (3) miscellaneous land types. The soils of the plain are alluvial materials deposited from the nearby upland and hills. The relief is nearly level with slopes up to 3 per cent. Soil erosion on this group of soils ranges from no apparent erosion to slight and moderate sheet erosion. Soils which are heavy, sticky and compact are less affected by erosion than those whose surface and subsoil are loose and friable. The soils of the upland, hills and mountains are derived from the weathering of igneous, sedimentary and metamorphic rocks in place. The soils are usually shallow and a slight erosion is easily noticeable. On account of their relief which is rolling, hilly and mountainous, soil erosion ranges from moderate to severe. That is, soil erosion has taken place to the extent

that about 1/4 of the original surface soil to more than 3/4 of the subsoil has been eroded. In the case of mountain soils, undifferentiated which are thickly forested, soil erosion is considered normal. In other words, there is a balance between soil erosion and soil formation from the parent rocks underneath.

The degree of erosion by which the different soils of the province have been subjected to are as follows:

Soil Mapping Unit	*Degree of Erosion*
Mogpog clay loam Mogpog sandy loam Laylay sandy clay loam Beach sand Hydrosol	Erosion 0, no apparent erosion
Laylay sandy clay loam Beach sand Zamboanguita sandy loam Lonos loam Lonos sandy loam Odiongan clay loam Tupi loam	Erosion 1, slight erosion Less than 1/4 to 3/4 of the original surface soil eroded.
Tuguis clay Odiongan clay loam Zamboanguita sandy loam España sandy clay loam España loam, stony phase Tupi loam Malalag-Faraon complex Romblon clay	Erosion 2, moderate erosion From 1/4 to 3/4 of the original surface soil eroded.
Tuguis clay Odiongan clay loam Zamboanguita sandy loam España sandy clay loam España loam, stony phase Tupi loam Lonos sandy loam Lonos loam Romblon clay Santa Fe sandy loam Santa Fe loam	Erosion 3, severe erosion From 3/4 of the original surface soil to 1/4 of the subsoil eroded.
Romblon clay Tupi loam Malalag-Faraon complex	Erosion class 4, very severe erosion—all the surface soil to 3/4 of the subsoil eroded.
Mountain soils, undifferentiated	Normal erosion—There is a balance between soil erosion and soil formation.

EFFECTS OF SOIL EROSION

Soil erosion has an exhausting influence on agriculture. Previously, very little concern was given to its adverse effects. It was only recently that we become aware of the fact that erosion if left uncontrolled will eventually deplete our agricultural lands of their productivity, thereby affecting the nation's economic stability and prosperity.

PHYSICAL EFFECTS

Where erosion exists, the first to suffer is the land which is gradually robbed of its surface soil or furrow slice. This means that not only the inherent fertility of the soil is lost but costly commercial fertilizers added are wasted as well. Much more, if the furrow slice shall be comprised less of the surface soil and more of the subsoil which is usually less fertile, there will be greater difficulty in maintaining a satisfactory physical condition of the soil. Moreover, eroded soil materials, such as sand and gravel, have at times covered entire fields of newly cultivated crops causing so much loss in seeding and interference in subsequent cultivation. The objectives of any scheme of soil management, however good, is therefore seriously interfered with. One appreciable effect of soil erosion is the silting up of reservoirs which reduces their storage capacity and adding greatly to the expense of their upkeep. Gullying and stream bank cutting of agricultural lands seriously impair the productive capacity of the farm and the farmer's income suffers an appreciable loss. Likewise, highways near or parallel to stream or river courses suffer from stream bank cutting and those along the hills and mountains suffer from landslides thereby the means of transportation is seriously impeded.

ECONOMIC AND CULTURAL EFFECTS

The adverse effects of accelerated or man-made soil erosion are much too obvious that they need not be over emphasized. Unfortunately, however, most people take the existence of soil for granted in the manner that almost everyone always indifferently regards the existence of the air we breathe. Whereas our supply of the latter has never been doubted, the certainty of our enjoying the bounty of the former cannot last forever unless we recognize the imminent dangers of soil erosion.

Soil conditions have much to do to shape the pattern of a nation's existence. While we begin by trying to analyze their effects from an agricultural point of view, we ultimately arrive at their economic and social effects as well. This is so because agricultural, economic and social conditions are closely interrelated so much so that it is quite difficult to separate them too sharply. Erodibility being one of many soil conditions, should ever be borne in mind as much as fertility.

We know that food, shelter, and clothing, man's basic needs, all emanate from the soil. Soil lost to us if taken in terms of the economic value of production of these basic needs surely would amount to enormous figures. The high cost of living may then be partially understood.

We know that while soil loss mounts, there is no sign that population also declines. The tendency is when population increases, people tend to overwork the soil. Overworking the soil inevitably results in decline of productivity. Soil erosion then commences and if unchecked, the people simply abandon the affected area and move to other places. This may happen once or more than once within a generation. What has started as an agricultural problem also becomes an economic and social problem.

We know that industry, especially the manufacture of consumer goods, is dependent on the supply of various raw materials. By and large, these raw materials are produced from the soil. Industry, therefore, directly and indirectly is affected by soil erosion. In turn when factories shut down or curtail operations, men lose their jobs and another social problem is added.

Soil erosion, therefore, is not the individual farmer's problem alone. While it affects his capacity to provide for his family's wants and meet his social obligations, erosion eventually becomes a community's, a province's and finally a nation's agricultural, economic, and social concern.

METHODS OF EROSION CONTROL

There are two general ways of erosion control in croplands; namely, (1) vegetative measures, and (2) mechanical means. Vegetative measures are simpler and easier to apply, while mechanical means usually require engineering aids, tools, and

machinery. The former is usually employed on land that are nearly level to gently rolling, while the latter is adapted to rolling and undulating land. Sometimes both means are employed simultaneously, or one in support of the other depending upon attendant circumstances.

VEGETATIVE MEASURES

Control of erosion by vegetative means deals with the use of plants following the normal farm operations and use of ordinary implements and machinery.

Cover cropping.—Vegetative cover is the first protection against runoff and erosion. Cover crops are usually planted after the harvest of row tilled or seasonal crops. There are also permanent cover crops which are mostly planted in orchards. When planting cover crops mulches of dead stems, leaves, or straw are necessary since cover crops offer protection only after they have attained considerable growth.

Strip cropping.—This vegetative method of erosion control is the alternate cultivation of clean tilled crops on one strip and dense close growing crops on the next strip. These alternate strips break up a relatively large sloping field into small narrow bands lying across the slope. They serve to check the momentum of runoff and to filter out the soil particles. The subsequent loss of the speed of runoff allows rain water to seep into the soil rather than readily flow down the slope. Soil and water are thus conserved.

Buffer strip cropping.—Buffer strips are established bands usually on the contour, two or three meters wide, planted to perennial grass or other erosion-resisting vegetation. They are arranged in regular alternation with relatively wider strips of row tilled crops. Buffer strips are adapted to land with slopes up to eight per cent. When the slope is long, a combination of vegetative and some mechanical means may be necessary. Grasses such as Guinea grass, Napier, Browntop, Bermuda grass, and *Ipil-ipil* (periodically trimmed to about a foot high) are recommended.

Grassed waterways.—Waterways in soils work are either natural or man-made depressions on sloping areas which serve as passageways for water that goes through a farm from adjacent land or accumulating on it due to rain. They are important in any scheme of soil and water conservation.

Naturally located depressions serve the purpose best. Man-made canals strategically laid are also necessary for more efficient discharge of runoff. The establishment of a dense vegetative cover over all waterways is imperative. Grasses readily adaptable to the area should be used, but whenever practicable those species which form a dense turf are preferable. Inasmuch as waterways are supposed to carry heavy flows during certain periods they should be designed to handle maximum runoff from the heaviest rainfall occuring in the locality once in about eight to ten years. Grassed waterways are essential wherever excess runoff accumulates such as in strip cropped fields.

MECHANICAL MEASURES

On steep slopes vegetative measures offer inadequate protection for the soil. Mechanical means of erosion control are therefore essential in conjunction with the vegetative phase.

Contour tillage.—Contour tillage is plowing and planting on the contour. This is an erosion control measure which is most effective on two to eight per cent slopes and less than 100 meters long. Ridges formed by the tillage implements retard the downhill flow of water. These ridges serve adequately when rainfalls are intense or heavy. Contouring is not enough protection especially when slopes are not uniform and above eight per cent, when the fields are already eroded, or when subsoils are clayey and compact. In these cases excess runoff may break through the ridges thus necessitating the adoption of other mechanical conservation measures like terracing.

Terracing.—Terraces are mechanical measures of soil conservation and are differentiated into three types; namely, (1) absorptive, (2) bench, and (3) drainage.

Absorptive terrace or ridge type is designed for moisture conservation. It is adapted to gentler slopes and absorptive soils.

Bench terrace is constructed on the contour. It has a steep drop and adapted to steeper slopes.

Drainage terrace or broad channel type is designed to conduct water from a field at low velocity.

As used in this text, terrace may denote a ridge type or a combination of ridge and channel type.

Terraces are built across a slope. They are either level or graded depending upon the purpose for which they are made. Graded terraces lead runoff from the field at nonerosive velocities. Level terraces impound most of the water giving it time to soak into the soil. Where the average annual rainfall is less than 30 inches, level terraces are recommended. Dimensions of terraces are also of utmost importance. They should be large enough to avoid overtopping. Usually the runoff which may be expected from the heaviest rain occurring on an average of once in 10 years is used as a basis. Their shape is generally based on the farming equipment used.

Terrace construction requires technical skill, financing, and special implements and machinery. Aside from these considerations, one must realize that all slopes and all soils cannot be successfully or economically terraced. Sandy, stony, and shallow soils, fields dotted by humps or mounds, or slopes that change planes and steepness every 30 meters are impractical to build terraces on.

Diversion ditches.—Diversion ditches or diversion terraces are built to intercept the runoff from drainage areas. They are usually large than field terraces. They are designed to protect cultivated fields from hillside runoff by providing for a passageway of the water away from the fields to other nearby areas where it is spread or dispersed. Where adjacent slopes generate runoff towards a terraced area, diversion ditches carry the water away from the terrace system, or if towards a gully diverting the water assists in controlling its further enlargement.

OTHER ASPECTS OF EROSION CONTROL

Whereas erosion depletes the soil of its inherent fertility, low fertility also brings about soil eroson. Infertile soils invariably mean poor vegetation, thus more surface soil is exposed to direct rain and wind action. Therefore, soils of low fertility when tilled are highly erodible. In this case proper and adequate fertilization can minimize erosion.

The regular application of farm manures and the practice of green manuring increase the soil's organic matter content. Organic matter, aside from enhancing soil fertility, also improves tilth and maintains if not improve soil structure. Stable and favorable soil structure means higher porosity and better permeability. When soils are porous and permeable plant root penetration is improved. All of these favorable physical conditions when attained promote the soil's water absorbing and water holding capacities or in other words surface runoff is minimized.

Crop rotation should essentially be a part of every farm program. A well planned scheme of crop rotation, aside from providing a practical means of utilizing green manures and fertilizers, counteracting possible development of toxic substances, and improving crop quality and increasing yields, also minimizes or helps control erosion. This farm practice keeps the soil in suitable physical condition, helps maintain the supply of organic matter and nitrogen in the soil, provides vegetative cover, and changes the location of the feeding ranges of roots.

The physical effects of liming such as the promotion of soil granulation of fine textured soils and the modification and improvement of the structure of coarse textured soils thus making them lighter to work on subsequently contribute much to erosion control.

An efficient system of soil management in support to vegetative and mechanical measures is, indeed, necessary to combat soil erosion. The different practices followed or adopted should form a farm program that as a unit could fit the kind of soil or kinds of soils within a farm so that the end attained is the combined beneficial effects of the many interesting processes involved. Each farmer, therefore, should first appraise the erosion hazards of his farm, then plan a cropping system and supporting conservation practices to reduce or offset the erosion hazards.

GLOSSARY OF COMMON ECONOMIC PLANTS FOUND IN ROMBLON PROVINCE

Common Name	*Scientific Name*	*Family*
Abaca	*Musa textilis* Nee.	Musaceae
Agingay	*Rottboellia exaltata* Linn.	Gramineae
Agoho	*Casuarina equisetifolia* Linn.	Casuarinaceae
Akle	*Albizzia acle* (Blanco) Merr.	Leguminosae
Alugbati	*Basella rubra* Linn.	Basellaceae
Ampalaya	*Momordica charantia* Linn.	Cucurbitaceae
Api-api	*Avicennia officinalis* Linn.	Verbenaceae
Apitong	*Dipterocarpus grandiflorus* Blanco	Dipterocarpaceae
Arrowroot	*Maranta arundinaceae* Linn.	Marantaceae
Atis	*Anona squamosa* Linn.	Anonaceae
Avocado	*Persea americana* Mill.	Lauraceae
Bakauan	*Rhizophora mucronata* Linn.	Rhizophoraceae
Balimbing	*Averrhoa carambola* Linn.	Oxalidaceae
Balete	*Ficus benjamina* Linn.	Moraceae
Bamboo	*Bambusa spinosa* Roxb.	Gramineae
Banaba	*Lagerstroemia speciosa* (Linn.) Pers.	Lythraceae
Banana	*Musa sapientum* Linn.	Musaceae
Bangkal	*Nauclea orientalis* Linn.	Rubiaceae
Batao	*Dolichos lablab* Linn.	Leguminosae
Binayoyo	*Antidesma ghaesembilla* Gaertn.	Euphorbiaceae
Binunga	*Macaranga tanarius* (Linn.) Muell.-Arg.	Euphorbiaceae
Boho	*Schizostachyum lumampao* (Blanco) Merr.	Gramineae
Breadfruit	*Artocarpus communis* Forst.	Moraceae
Buri	*Corypha elata* Roxb.	Palmae
Cabbage	*Brassica oleracea* var *capitata* Linn.	Cruciferae
Cacao	*Theobroma cacao* Linn.	Sterculiaceae
Cadios	*Cajanus cajan* (Linn.) Millsp.	Leguminosae
Caimito	*Chrysophyllum cainito* Linn.	Sapotaceae
Calopogonium	*Calopogonium muconoides* Desv.	Leguminosae
Cashew	*Anacardium occidentale* Linn.	Anacardiaceae
Cassava	*Manihot esculenta* Grantz.	Euphorbiaceae
Chico	*Achras sapota* Linn.	Sapotaceae
Coconut	*Cocos nucifera* Linn.	Palmae
Coffee	*Coffea sp.* Linn.	Rubiaceae
Cowpea	*Vigna sinensis* (Linn.) Savi.	Leguminosae
Cotton	*Gossypium hirsutum* Linn.	Malvaceae
Cogon	*Imperata cylindrica* (Linn.) Beauv.	Gramineae
Corn	*Zea mays* Linn.	Gramineae
Cucumber	*Cucumis sativus* Linn.	Cucurbitaceae

Common Name	*Scientific Name*	*Family*
Dao	*Dracontomelum dao* (Blanco) Merr. and Rolfe	Anacardiaceae
Derris	*Derris elliptica* (Roxb.) Benth	Leguminosae
Dita	*Alstonia scholaris* (Linn.) R. Br.	Apocynaceae
Duhat	*Eugenia cumini* (Linn.) Drice	Myrtaceae
Eggplant	*Solanum melongena* Linn.	Solanaceae
Gabi	*Colocassia esculenta* (Linn.) Schott. and Endl.	Araceae
Garlic	*Allium sativum* Linn.	Liliaceae
Ginger	*Zingiber officinale* Rosc.	Zingiberaceae
Guava	*Psidium guajava* Linn.	Myrtaceae
Guayabano	*Anona muricata* Linn.	Anonaceae
Guijo	*Shorea guiso* (Blanco) Blume Mus.	Dipterocarpaceae
Ipil-ipil	*Leucaena glauca* (Lin.) Benth.	Leguminosae
Jackfruit	*Artocarpus heterophyllus* Lam.	Moraceae
Jute	*Corchorus capsularis* Linn.	Tiliaceae
Kakauati	*Gliricidia sepium* (Jacq.) Steud.	Leguminosae
Kalamansi	*Citrus mitis* Blanco	Rutaceae
Kamachile	*Pithecolobium dulce* (Roxb.) Benth.	Leguminosae
Kamansi	*Artocarpus camansi* Blanco	Moraceae
Kamias	*Averrhoa bilimbi* Linn.	Oxalidaceae
Kapok	*Ceiba pentandra* (Linn.) Gaerth.	Bombacaceae
Katurai	*Sesbania grandiflora* (Linn.) Pers.	Leguminosae
Kondol	*Benincasa hispida* (Thunb.) Cogn.	Cucurbitaceae
Kudzu	*Pueraria javanica* Benth.	Leguminosae
Lanzones	*Lansium domesticum* Correa	Meliaceae
Lemon	*Citrus limonia* Osbeck Reise Ostind	Rutaceae
Lettuce	*Lactuca sativa* Linn.	Compositae
Lumbang	*Aleurites moluccana* (Linn.) Wild.	Euphorbiaceae
Makopa	*Syzygium samarangense* (Blume) Merr. and Perry	Myrtaceae
Malungay	*Moringa oleifera* Lam.	Anacardiaceae
Mango	*Mangifera indica* Linn.	Moringaceae
Marang	*Artocarpus odoratissima* Blanco	Moraceae
Molave	*Vitex parviflora* Juss.	Verbenaceae
Mungo	*Phaseolus aureus* Roxb.	Leguminosae
Mustard	*Brassica integrifolia* (West) Schulz.	Cruciferae
Nangka	*Artocarpus heterophyllus* Lam.	Moraceae
Narra	*Pterocarpus indicus* Willd.	Leguminosae
Nipa	*Nypa fruticans* Wurmb.	Palmae
Onion	*Allium cepa* Linn.	Liliaceae
Orange	*Citrus aurantium* Linn.	Rutaceae
Palosapis	*Anisoptera thurifera* (Blco.) Blume	Dipterocarpaceae
Pandan	*Pandamus tectorius* Solander	Pandanaceae
Papaya	*Carica papaya* Linn.	Caricaceae
Patani	*Phaseolus lunatus* Linn.	Leguminosae
Patola	*Luffa cylindrica* (Linn.) M. Roem.	Cucurbitaceae
Peanut	*Arachis hypogaea* Linn.	Leguminosae
Pechay	*Brassica chinensis* Linn.	Cruciferae

Pineapple	*Ananas comosus* (Linn.) Merr.	Bromeliaceae
Pummelo	*Citrus maxima* (Burm.) Merr.	Rutaceae
Radish	*Raphanus sativus* Linn.	Cruciferae
Rattan	*Calamus spp.* Linn.	Palmae
Rice	*Oryza sativa* Linn.	Gramineae
Rimas	*Artocarpus communis* Forst.	Moraceae
Sampaloc	*Tamarindus indica* Linn.	Leguminosae
Santol	*Sandoricum koetjape* (Burm. f.) Merr.	Myrtaceae
Seguidilla	*Psophocarpus tetragonolobus* (Linn.) DC. Prodr.	Leguminosae
Sincamas	*Pachyrrhizus erosus* (Linn.) Urb.	Leguminosae
Sineguelas	*Spondias purpurea* Linn.	Anacardiaceae
Sitao	*Vigna sesquipedalis* Fruw.	Leguminosae
Soybean	*Glycine max* (Linn.) Merr.	Leguminosae
Squash	*Cucurbita maxima* Duchesne	Cucurbitaceae
Sugar cane	*Saccharum officinarum* Linn.	Gramineae
Sweet potato	*Ipomoea batatas* Linn.	Convolvulaceae
Talahib	*Saccharum spontaneum* Linn.	Gramineae
Talisay	*Terminalia catappa* Linn.	Combretaceae
Tambo	*Phragmites vulgaris* (Linn.) Trin.	Gramineae
Tangile	*Shorea polysperma* (Blanco) Merr.	Dipterocarpaceae
Tobacco	*Nicotiana tabacum* Linn.	Solanaceae
Tomato	*Lycopersicum esculentum* Mill.	Solanaceae
Tugui	*Dioscorea esculenta* (Leur.) Burkill	Dioscoreaceae
Ubi	*Dioscorea alata* Linn.	Dioscoreaceae
Upo	*Lagenaria leucantha* (Ducg.) Rusby	Cucurbitaceae
Waling-waling	*Vanda sanderiana* Reichb.	Orchidaceae
Watermelon	*Citrullus vulgaris* Schrad.	Cucurbitaceae
White lauan	*Pentacme contorta* (Vidal) Merr. & Rolfe.	Dipterocarpaceae
Yakal	*Shorea gisok* Forw.	Dipterocarpaceae

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