

LAND USE AND LANDSCAPE CHANGE
ALONG THE DOMINICAN-HAITIAN BORDERLANDS

By

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A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA
1976



ACKNOWLEDGMENTS

Without the constant help and encouragement of my wife Ann this project would have been impossible. Her enthusiasm for the field work never faltered. She cheerfully walked the nineteen kilometers from Belladere to Lascahobas when the road was impassable by jeep. During our year in the field her rapport with the townspeople in both Elias Piña, Dominican Republic, and Belladere, Haiti, opened doors which I would never have known existed. In Haiti she was my French teacher and, on our many visits to government offices in Port-au-Prince (where good French is highly respected) she served as interpreter. Her ideas and suggestions for the study were invaluable. During the writing stage of the dissertation she helped with the typing, editing and revisions. And when the project seemed to weigh most heavily, she reminded me, ever so gently, that life's ultimate issues were not, after all, at stake. For all of these reasons she deserves a great deal of credit for any merit which is found in this dissertation.

I wish to express my appreciation to the dissertation committee--Dr. Gustavo A. Antonini, Chairman; Dr. David L. Niddrie, Dr. Raymond Crist, Dr. Richard A. Edwards and Dr. Clark I. Cross, Chairman of the Geography Department.

Dr. Antonini was most generous with his time and guidance from the first draft of the proposal, through the field work, to the editing of the final manuscript. Special thanks are due Dr. Niddrie for ideas which he stimulated in the classroom and for both substantive and stylistic suggestions for the manuscript.

Many friends in the Dominican Republic and Haiti deserve a note of thanks. Engineer José J. Hungría, Director of the Instituto Geográfico Universitario in Santo Domingo provided invaluable help and advice for the Dominican portion of the field study. In Port-au-Prince, Messrs. Julio Silva and Roland Roy of the Organization of American States were most helpful. My wife and I are also grateful to our many missionary friends who frequently gave us lodging. And finally, we are appreciative of the hospitality extended to us by the townspeople of Elias Piña and Belladere.

The field research was made financially possible by a grant from the Organization of American States. The National Science Foundation provided a supplementary grant for the purchase of a jeep, which was indispensable. In addition, the Tinker Foundation of New York provided assistantship funds for three months during the preparation stage and later for six months during the writing.

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Abstract of Dissertation Presented to the
Graduate Council of the University of Florida in Partial
Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

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June, 1976

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Major Department: Geography

This research project traces the evolution of the contrasting Haitian and Dominican landscapes along the borderlands of central Hispaniola. Primary emphasis is on the role of public policies as determinants of land use and settlement change.

Past landscapes are cartographically reconstructed based on information from historical documents, sequential aerial photography, and field interviewing. The resulting settlement and land-use maps are analyzed to explain the evolution of the frontier landscape.

The study region consists of a portion of the Artibonite River watershed in the Central Plain (Haiti)--San Juan Valley (Dominican Republic). Detailed field research was confined to the area immediately adjacent to the international border in the municipality of Elias Piña, Dominican Republic.

lic, and the commune of Belladere, Haiti. The region was selected for study because of the Dominican government's interest in expanding irrigation systems westward to the border and because of the interest on the part of the Haitian government in protecting the Artibonite watershed upstream from the large man-made reservoir, Lake Peligre.

Results of the study indicate that government policies from the early colonial period to the present have, indeed, played a significant role in the development of the contrasting frontier landscapes. The most far-reaching of these policies included the following: the early Spanish colonial policy of neglect for Hispaniola which led to the loss of the western third of the island to France; the Spanish policy of reserving the frontier for extensive cattle raising on large land grants as opposed to the Haitian policy of encouraging subsistence farming through the distribution of small landholdings; Haitian militarism during the first half of the nineteenth century which maintained the Dominican frontier in an underpopulated state and, in effect, retarded the processes of deforestation and soil depletion; and the Dominican frontier development programs of the Trujillo and Balaguer governments as contrasted to the Haitian government's general policy of laissez faire toward rural development.

In recent years mechanized agriculture, irrigation and modern communication and transportation have transformed the Dominican borderlands while the Haitian frontier has remained little changed and isolated from national life. Com-

mercial agriculture has become the dominant economic activity on the Dominican side while subsistence farming has remained the way of life for the great majority of Haitians.

Despite their differences, however, the Dominican and Haitian borderlands are facing the same problems of growing population pressure, declining soil fertility and shortening fallow. In Haiti, where soil depletion is more advanced, the fallow has been practically eliminated. Deprived of the fallow as a means of restoring soil fertility, the Haitian farmers have expanded their system of intercropping and developed additional techniques including hillside terracing, mulching, composting and contouring by which they are able to maintain their land in continuous production. Immediately across the border, however, where the forces of population pressure and soil depletion are less extreme the Dominican farmers have yet to resort to similar labor-demanding intensification techniques.

CHAPTER I
INTRODUCTION

Purpose and Scope

This study concerns man's impact on the landscape along the Haitian-Dominican border of Central Hispaniola. Evolving settlement and land use activities and their impact on the physical resource base of the region are evaluated for the period 1492 to 1974.

The border which separates Haiti and the Dominican Republic bisects a land of common physical resources, yet man's influence on the land has been so different from one side of the border to the other that striking contrasts have developed. Along many portions of the border the landscape changes abruptly from relatively dense forest on the Dominican side to deforested and virtually barren land on the Haitian side (Figure 1). The change is so marked that upon first glance it appears that the border must follow a physical feature such as a high ridge which might cause a sudden climatic change; however, this is not so. The differences in vegetation and soil erosion from one side of the border to the other are merely the results of man's activities on the land.



Figure 1: Aerial Photograph of the Border between Elias Piña, Dominican Republic, and Belladere, Haiti

Conceptually, the geographical contrasts along the border are viewed in this study not simply as the results of historic accidents, but rather as products of contrasting public policies which have differentially affected land use and settlement. These differing patterns of settlement and land use over time have altered the physical resource base and have led to the contrasting agricultural potentials apparent on the contemporary landscape. By relating historical changes in settlement and land use to specific public policies, this study demonstrates both the long and short-range effects of man's activities on the land. Such an approach is particularly useful as it illustrates empirically the inter-relatedness of factors influencing landscape change through time and thereby can provide a basis for planning future policies related to agricultural development in the region.

The historical-geographical approach used in the present study is termed "landscape evolution"; it is based on concepts first stated by Sauer and the University of California, Berkeley School of Geography, and more recently by Niddrie at the University of Manchester, Antonini at the University of Florida and Webb at Columbia University. Sauer, whose ample research reflects his appreciation of an historical perspective, based this approach on his conviction that an understanding of present settlement patterns

is possible only through a reconstruction of past landscapes.¹ Niddrie used a comparable historical approach in his study of land use in Tobago.² Webb termed such an historical perspective on settlement geography "landscape evolution" and noted that any present cultural landscape represents a selective accumulation of past determinants as well as contemporary influences.³ Antonini enlarged upon these concepts empirically and in quantitative terms by applying the "landscape evolution" concept to his historical interpretations of landscape change in the Dominican Republic.⁴

The landscape evolution approach is a conceptual framework which places the physical resource base within a dynamic continuum of interacting cultural processes termed "determinants." The present study includes such determinants as settlement patterns, farming practices and methods of land preparation. In order that the study may have practical future applications, emphasis is on specific

¹Carl O. Sauer, "Forward to Historical Geography," Annals of the Association of American Geographers 31 (1941):1-24.

²David L. Niddrie, Land Use and Population in Tobago, The World Land Use Survey, Monograph 3 (London: A. P. Taylor & Co., 1961).

³Kempton Webb, "Landscape Evolution: a Tool for Analyzing Population Resource Relationships," in Geography in a Crowding World, ed. Wilbur Zelinsky (New York: Oxford University Press, 1970), pp. 218-234.

⁴Gustavo A. Antonini, Processes and Patterns of Landscape Change in the Linea Noroeste, Dominican Republic (Ph.D. dissertation, Columbia University, 1968).
 _____, Katherine C. Ewel and Howard M. Tupper, Population and Energy: a Systems Analysis of Resource Utilization in the Dominican Republic (Gainesville: University Press of Florida, 1975).

cultural determinants and landscape features which are the product of both direct and latent public policies.

The study region, known as the San Juan Valley in the Dominican Republic and the Central Plain in Haiti, is an area of approximately 4,000 square kilometers located almost entirely within the Artibonite River drainage basin in Central Hispaniola⁵ (Figure 2). The primary criterion for selecting this region for study is its current importance to both the Haitian and Dominican governments. Haitian officials are concerned with the region because it forms a part of the Artibonite watershed immediately upstream from Lake Peligre, the large man-made reservoir which was completed in 1950. These officials, concerned with prolonging the life-span of the Peligre Hydroelectric Project, clearly see the need for controlling siltation in the lake by instituting soil control measures and land management programs upstream from the dam. The Dominican government's interest in the study region stems from its need to extend irrigation and to diversify agricultural production in the western portion of the adjacent San Juan Valley. Recently, Haitian and Dominican leaders have come to realize the importance of collaborative efforts for protecting their common physical resources within the borderlands. These

⁵"Artibonite" is the French spelling; "Artibonito" is the Spanish spelling. In this study the French spelling is used as it more closely approximates the English pronunciation.

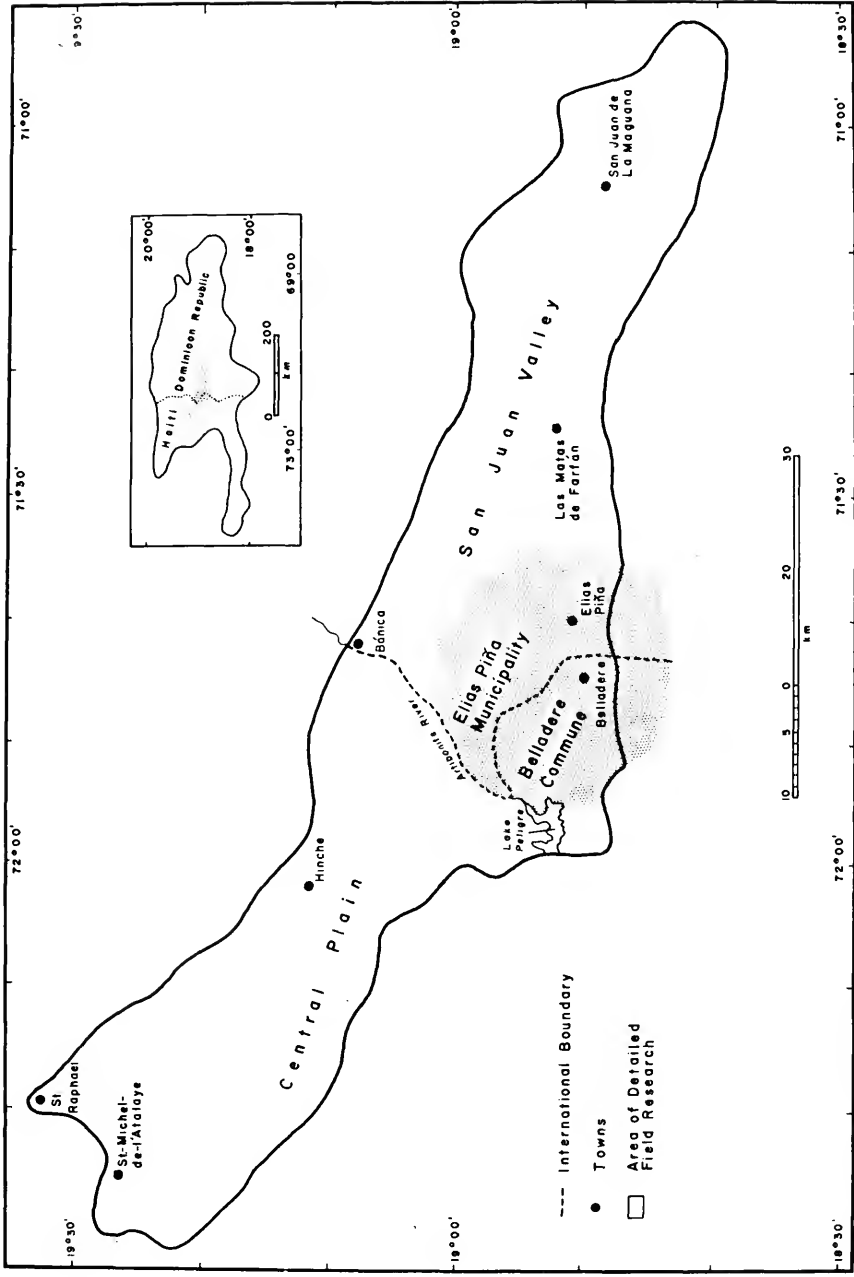


Figure 2: The Study Region

government officials have participated in unprecedented discussion of cooperative programs between the two governments.⁶

All in all, the unique cultural characteristics of the borderland, relaxed political relations between Haiti and the Dominican Republic, and the strong interest by both governments in fostering development within the region provided strong motivation to carry out the present study.

Historical Background

Descriptive, historical literature formed a cornerstone of the research in compiling land-use and settlement maps. From original records it was possible to define historical periods in the evolution of the present landscape and to represent each time period cartographically. The following periods are delineated: 1492 to 1789, the time of Spanish and French colonization; 1790 to 1899, the era of recurrent revolution and political strife; 1900 to 1961, the period of modernization and development; and 1962 to 1974, the contemporary period.

Events in Haiti were especially well documented during the French colonial period owing to the great importance of the colony's sugar production to the French economy. During the nineteenth century, scholars and

⁶Listín Diario (Santo Domingo), 5 August 1972.

curiosity seekers alike investigated the phenomenon of the first black republic and published their reports which were often more like travelogues than objective studies. Twentieth-century anthropologists, geographers and other social scientists, not to mention missionaries, social workers, and foreign technicians, have been attracted to Haiti for a variety of reasons and have published innumerable reports. In general, the Dominican Republic has been less researched. During the colonial period, the lack of interest was the result of the colony's small population and relative unimportance compared with Spain's other possessions in the New World. More recently, the Dominican Republic has simply lacked the sense of the exotic which attracts so much attention to Haiti.

Despite the mass of literature on the two countries, there is relatively little pertaining directly to the long-neglected central borderlands. An account of prequest cultures of Hispaniola is found in Krieger's essay on "The Aborigines of the Ancient Island of Hispaniola."⁷ Although containing no information on the western part of the island, the works of Las Casas and Oviedo are invaluable for an understanding of the early years of the Spanish colony.⁸

⁷Herbert W. Krieger, "The Aborigines of the Ancient Island of Hispaniola," Annual Report, 1929 (Washington: Smithsonian Institution, 1930), pp. 473-506.

⁸Bartolomé de las Casas, La apologética historia de las Indias, 13 vols. (Madrid: Nueva Biblioteca Autónoma Española, 1909).

González Fernández de Oviedo y Valdez, Historia general y natural de las Indias, 4 vols. (Madrid: Academia Real de la Historia, 1851-1855).

Several useful essays, parts of which deal with the study region, have been reprinted in volumes edited by the Dominican historian Rodríguez Demorizi; of particular value are the accounts of López de Velasco, Araujo y Rivera, and Alcocer, dealing with the Spanish colony in the sixteenth and seventeenth centuries.⁹

The work by Vassière contains valuable information on the French colony of Saint Domingue.¹⁰ The best account of the buccaneers, who played an important though indirect role in the development of the central part of the island from about 1630 to the 1690s, is found in the excellent work by Oexmelin.¹¹ Unquestionably the single most important source for any geographical study of eighteenth-century Hispaniola is the four-volume study by Moreau de Saint-Mery, two volumes of which are devoted to the Spanish colony and two to the French. As the central borderlands were entirely

⁹Juan López de Velasco, "Geografía de la isla española, 1574," in Relaciones geográficas de Santo Domingo, 2 vols., ed. Emilio Rodríguez Demorizi (Santo Domingo: Editora del Caribe, 1970), pp. 13-32.

Fernando Araujo y Rivera, "Descripción de la isla española o de Santo Domingo, 1699," in Relaciones históricas de Santo Domingo, 3 vols., ed. Emilio Rodríguez Demorizi (Ciudad Trujillo: Editora Montalvo, 1942-1957), 1:293-341.

Gerónimo Alcocer, "Relación sumaria, 1650," in Relaciones históricas de Santo Domingo, 3 vols., ed. Emilio Rodríguez Demorizi (Ciudad Trujillo: Editora Montalvo, 1942-1957), 1:197-268.

¹⁰Pierre de Vassière, Saint Domingue, la société et la vie créole sous l'ancien régime, 1629-1789 (Paris: Librairie Académique, 1909).

¹¹Alexandre-Olivier Oexmelin, Histoire des aventuriers flibustiers qui signalent dans les Indes, 4 vols. (Travoux: Par la Compagnie, 1744).

Spanish territory at the time of Saint-Mery's writing, the area of interest in this study is included in his volumes on the Spanish colony.¹² The primary source for information on the generally neglected subject of overland trade between the Spanish and French colonies is the eighteenth-century study by Raynal.¹³

Useful information about nineteenth-century Haiti is found in a series of books written by Europeans, some of whom went to Haiti to oversee investments, or to confirm the widespread accounts of the decline and chaos which had followed the expulsion of the French. Of particular note are the accounts by Harvey, Franklin, Brown, Candler, and Hazard.¹⁴ The little-known work by Thoby is of interest for any study of land use in Haiti.¹⁵

¹²M. L. E. Moreau de Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 2 vols., trans. William Cobbett (Philadelphia: By the Author, 1796).

¹³Guillaume Thomas François Raynal, A Philosophical and Political History of the Settlements of the Europeans in the East and West Indies, 10 vols., trans. J. Justamond (London: T. Cadel, 1776).

¹⁴William W. Harvey, Sketches of Haiti from the Expulsion of the French to the Death of Christophe (1821; reprint ed., London: Frank Cass and Co., 1971).

James Franklin, The Present State of Haiti (1828; reprint ed., London: Frank Cass and Co., 1971).

Jonathan Brown, The History and Present Condition of St. Domingo, 1837 (1837; reprint ed., London: Frank Cass and Co., 1972).

John Candler, Brief Notices of Hayti with its Condition, Resources and Prospects (London: Thomas Ward and Co., 1842).

Samuel Hazard, Santo Domingo, Past and Present: with a Glance at Haiti (New York: Harper & Brothers, 1873).

¹⁵Armand Thoby, La question agraire en Haiti (Port-au-Prince: n.p., 1888).

States Geological Survey under the direction of Woodring and Vaughan during the United States Marine occupations of the two countries.¹⁸ The more recent geological study of Haiti by Butterlin draws heavily on the work of Woodring.¹⁹ The recent Organization of American States natural resource inventories of both Haiti and the Dominican Republic have proved to be useful sources.²⁰

Three contemporary studies which have dealt with border areas of Hispaniola are Crist's article on the cultural dichotomy along the southern border, Wood's interpretation of land use and settlement in northern Haiti, and Antonini's historical study of northwestern Dominican Republic.²¹ No published study exists dealing concurrently with the central borderlands of both the Dominican Republic

¹⁸Wendell P. Woodring, John D. Brown and Wilbur S. Burbank, Geology of the Republic of Haiti (Port-au-Prince: Geological Survey of the Republic of Haiti, 1924).

Thomas Wayland Vaughan et al., A Geological Reconnaissance of the Dominican Republic (Washington, D.C.: United States Geological Survey, 1921).

¹⁹Jacques Butterlin, Géologie générale et régionale de la République d'Haïti (Paris: Institut des Hautes Etudes de l'Amérique Latine, 1960).

²⁰Organization of American States, Reconocimiento y evaluación de los recursos naturales de la República Dominicana (Washington, D.C.: Organization of American States, 1967).

Organization of American States, Haïti, mission d'assistance technique intégrée (Washington, D.C.: Organization of American States, 1972).

²¹Raymond E. Crist, "Cultural Dichotomy on the Island of Hispaniola," Economic Geography 18 (1952): 105-122.

Harold A. Wood, Northern Haiti: Land, Land Use and Settlement (Toronto: University of Toronto Press, 1963).

Antonini, Processes and Patterns of Landscape Change.

and Haiti. The logistics of such a study, particularly the difficulty for many years of obtaining freedom of passage back and forth across the border, have discouraged potential researchers. Relaxation of political tensions over the past four years has made the present study possible.

Field Methods

The area selected for detailed field study comprises the Dominican municipality of Elias Piña and the adjacent Haitian Commune of Belladere.²² Administrative units were chosen for comparison so that the study could benefit from census information on population and agriculture. Criteria for selecting the areas for comparative study were their adjoining locations, approximate equal area, and marked changes in land use from one side of the border to the other as indicated on aerial photographs.²³

Field research consisted of mapping land use and conducting structured interviews with both village elders and local farmers. Land-use mapping was carried out using compass traverse methods and the information verified on

²²The entire San Juan Valley-Central Plain was studied from a historical perspective with reconnaissance-level field work but the more detailed field research including aerial photographic interpretation, field mapping and interviewing was limited to a much smaller, representative region adjoining the border. Both the municipality and commune are roughly equivalent to a county in the United States.

²³The commune of Belladere covers an area of 300.37 square kilometers and the municipality of Elias Piña 357 square kilometers.

aerial photography taken in 1958, was plotted directly on the 1:50,000 scale topographic maps covering the region.

Interviews with older residents were designed to elicit responses describing changes in such landscape features as location of towns, types of crops grown, changes in agricultural methods, and changes in forest cover which have occurred within their period of memory. Only those people who were recognized leaders and who were old enough to remember at least as far back as the early years of the present century were interviewed. A minimum of two interviews was conducted in each of the fourteen rural sections (the smallest administrative unit) on the Dominican side of the border. On the Haitian side, the same total number of interviews was conducted (Appendix 1).

Interviews with local farmers were designed to elicit information on current agricultural practices and to verify land use patterns. Data obtained from these interviews along with information gleaned by direct observation was intended to complement and explain the information recorded on the twentieth-century land-use maps. The incorporation of such information assisted in completing the account of landscape evolution to the year 1974. Interviews based on a twenty-eight item questionnaire were conducted throughout Belladere (Appendix 1). A sample size of 1 percent of the heads of households, for a total of sixty-two interviews, was used basing household size on the

figure of five persons per house.²⁴ These interviews were based on a random sample on a uniform grid; the sample design was stratified by approximate population density in the region. Comparable data for Elias Piña were obtained from the Dominican Population Census of 1970 and the Dominican Agricultural Census of 1971.

Plan of Presentation

Following this introduction, Chapter II is concerned with the physical setting of central Hispaniola, its climate, landforms, and vegetation. Chapters III and IV deal with settlement and land use during the historical period from the discovery of the island to the beginning of the Haitian revolution in 1790, and then from the Haitian revolution to the end of the nineteenth century, respectively. Chapter V, based on oral history accounts, covers the period 1900 to 1961, the time of most rapid landscape change. Chapter VI deals with population and settlement trends from the death of the Dominican dictator Rafael Trujillo to 1974. These historical chapters are accompanied by land-use and settlement maps which, when examined sequentially, illustrate the changes which have occurred in the study region from one period to the next. Chapter VII relates contemporary agriculture and land use

²⁴Household size is based on figures from the Service of Malaria Eradication, Port-au-Prince.

on both sides of the border to present-day landscape conditions. Chapter VIII is a summary of the results of the study and concludes with general considerations regarding possible future changes within the region.

CHAPTER II
THE PHYSICAL SETTING

Location and Extent

The study region consists of the San Juan Valley in the Dominican Republic and its westward extension, the Central Plain of Haiti.¹ This northwest-southeast trending physiographic region, one of the largest interior plains of Hispaniola, covers about 2,000 square kilometers on each side of the border. The northern limit of the Valley-Plain is the south-facing escarpment of the Cordillera Central (Massif du Nord), the island's principal mountain range, while its southern boundary is the north-facing escarpment of the Sierra de Neiba (Montagnes Noires). To the east, the region narrows near the confluence of the San Juan and Yaque del Sur rivers where spurs from the Sierra de Neiba and the Cordillera Central extend out onto the valley floor.²

¹Moreau de Saint-Mery referred to the Haitian portion of the study region as the Plain of Guava. The name Central Plain was first used by William F. Jones in "A Geological Reconnaissance of Haiti," Journal of Geology 26 (1918):720.

²The eastern limit of the valley is sometimes said to be near the town of Padre las Casas further to the east. Although this additional area falls within the same drainage basin, its mountainous terrain precludes it from inclusion in the same physiographic region. The Central Plain-San Juan Valley is sometimes included with the Azua Plain as a single physical region. It appears, however, that the two are sufficiently separated physiographically to warrant separate classification.

The western limit is defined by outliers from the Massif du Nord and Montagnes Noires. As a whole, the study region varies in width from sixteen kilometers at Hinche to forty kilometers along the international border; it measures approximately 150 kilometers from east to west. Elevation above sea level ranges between 300 and 400 meters with a slight downward slope from west to east.

Climate

Topographic barriers, the Northeast Trade Winds and both the continental and Atlantic high-pressure systems are the primary climatic influences all of which combine to influence development of a bi-modal precipitation pattern in the study region. The seasons of highest rainfall, April to June and September to October, occur when the Trades are most laden with moisture and the two high-pressure systems have declined. The two dry seasons, from December to March and to a lesser extent, from July to August, occur as a result of the dominating influence of the high-pressure systems and relative lack of moisture in the Trade Winds. Rainfall in the study region is generally unreliable and varies greatly from year to year (Figure 3). The region is subject to frequent droughts.³

³Despite universal belief in the study region that drought is a recent phenomenon, precipitation figures for the past 35 years show no decline (Appendix 2). Colonial writings indicate that the San Juan Valley has long been subject to droughts: "In the Canton of San Juan they raise many animals, but the region is subject to severe droughts" (Saint-Mery, Topographic and Political Description of the Spanish Part of Saint Domingo, 1:259.)

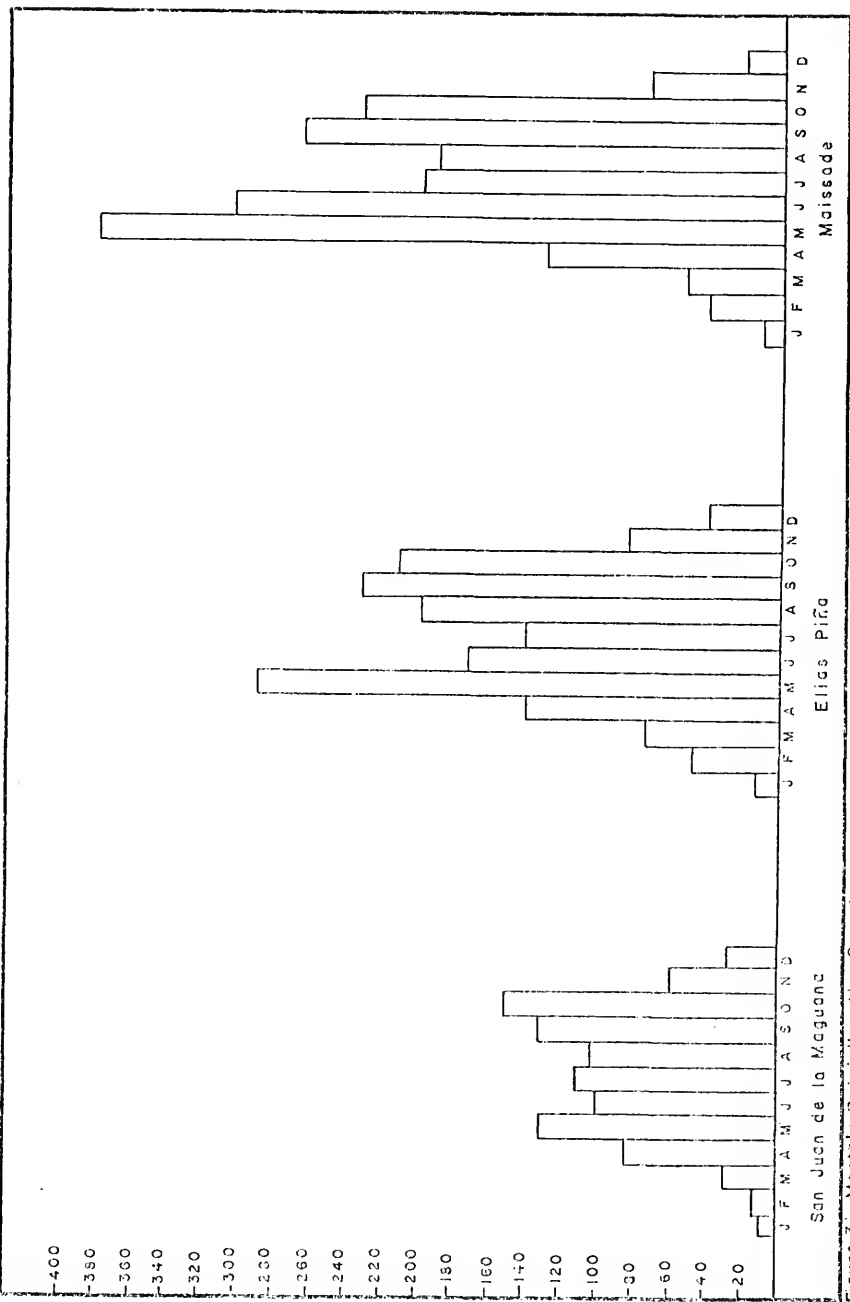


Figure 3: Monthly Rainfall in the San Juan Valley-Central Plain (in Millimeters)

The northwest-southeast trending mountain ranges act as a partial barrier to precipitation (Figure 4). As the mountains decrease in height from east to west, mean annual rainfall increases from 949 mm in San Juan de la Maguana to 1,633 mm in Elias Piña and 1,902 mm in Maissade.⁴

Temperatures in the study region show little seasonal variation. Mean monthly temperatures in San Juan de la Maguana are 26.4°C for August and 21.5°C for January. These temperatures increase slightly to the west. Mean monthly temperatures in Hinche are 28.8°C for August and 22.5°C in January.⁵ High temperatures are associated with high evapotranspiration rates which, along with high soil permeability, lead to the semi-arid conditions in much of the region.

Geomorphology and Natural Subregions

Geomorphic characteristics of the present landscape can be explained by an outline of events in the geologic history of the region. Indications are that during an earlier geologic era drainage of the entire Central Plain-San Juan Valley was in a southeastern direction through the

⁴Organization of American States, Reconocimiento y evaluación de los recursos naturales de la República Dominicana, p. 2.

Organization of American States, Haïti, mission d'assistance technique intégrée, p. 448.

⁵Organization of American States, Reconocimiento y evaluación de los recursos naturales de la República Dominicana, p. 437.

Organization of American States, Haïti, mission d'assistance technique intégrée, p. 463.

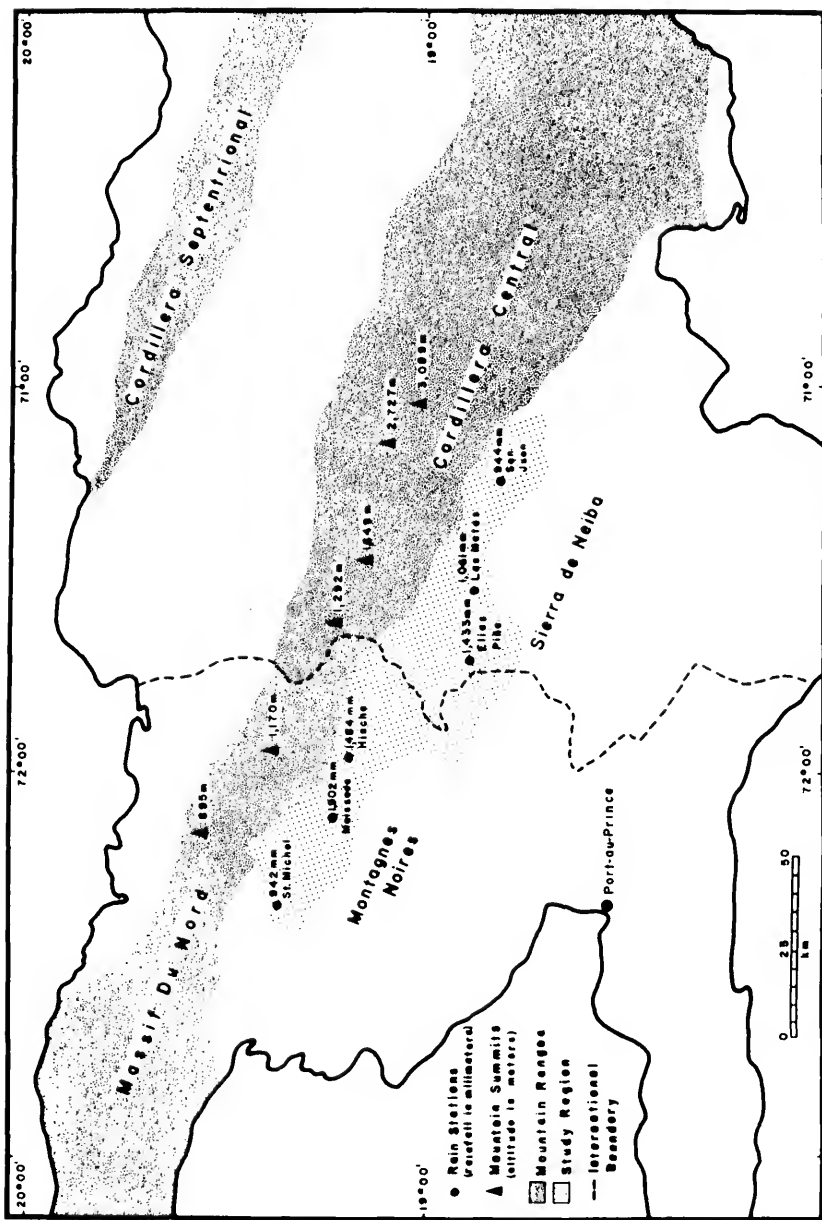


Figure 4: Topographic Barriers To Precipitation, San Juan Valley-Central Plain

present-day San Juan Valley and out to sea via the channel of what is today the Yaquedel Sur River. During that time, Pliocene sediments were laid down throughout the length of the San Juan Valley.⁶ With the change in course of the Artibonite River, most of these sediments were eroded away leaving only remnants. The accordant summits of these Pliocene erosion remnants gradually decrease in altitude from west to east constituting evidence of the previous drainage system.⁷ The San Juan Valley owes its relatively high fertility to this earlier southeastward drainage system.

The diversion of the Artibonite River from its eastward course to its present channel has not yet been explained but stream piracy by a southwest-flowing stream in the Artibonite Valley was probably involved. By a process of headward erosion, the smaller stream eventually captured the waters of the Artibonite and diverted them through the Montagnes Noires.⁸ The principal effect of this change in drainage was the lowering of the base level thereby increasing the rate of down-cutting in the entire drainage basin, particularly in that part of the region nearest the Artibonite. Less resistant Pliocene and Miocene sediments were removed leaving remnants of the resistant

⁶Woodring, Brown and Burbank, Geology of the Republic of Haiti, p. 381.

⁷Ibid.

⁸Ibid., p. 382.

Harold A. Wood, "Stream Piracy in the Central Plateau of Hispaniola," The Canadian Geographer 8 (1956):46-54.

Miocene conglomerate which account for the rugged terrain in the central portion of the region. The eastern portion of the San Juan Valley continued to be drained in a southeastward direction and therefore was spared the increased stream erosion which produced the hilly topography further to the west.

The study region currently contains two separate watersheds with the western two-thirds draining in a southwest direction through the Artibonite River and the eastern portion draining to the southeast by means of the San Juan and Yaque del Sur Rivers (Figure 5). The drainage divide, consisting of a ten-meter-high gravel bench, is located three kilometers east of the town of Pedro Corto. The principal tributaries of the Artibonite are the Macasia River in the San Juan Valley and the Guayamouc River in the Central Plain. Other than the above-mentioned rivers, the only streams providing a perennial water supply adequate for irrigation are the Mijo and El Llano rivers of the San Juan Valley and the Honde Vert River in the Central Plain. Groundwater is of little potential use owing to its high salinity.

Woodring described the Central Plain-San Juan Valley as a southeast plunging syncline broken by occasional secondary synclinal and anticlinal folds.⁹ Throughout the region, rocks dip in toward the center of the Valley-Plain at about ten to fifteen degrees. Sedimentary rocks underlie

⁹Woodring, Brown and Burbank, Geology of the Republic of Haiti, p. 161.

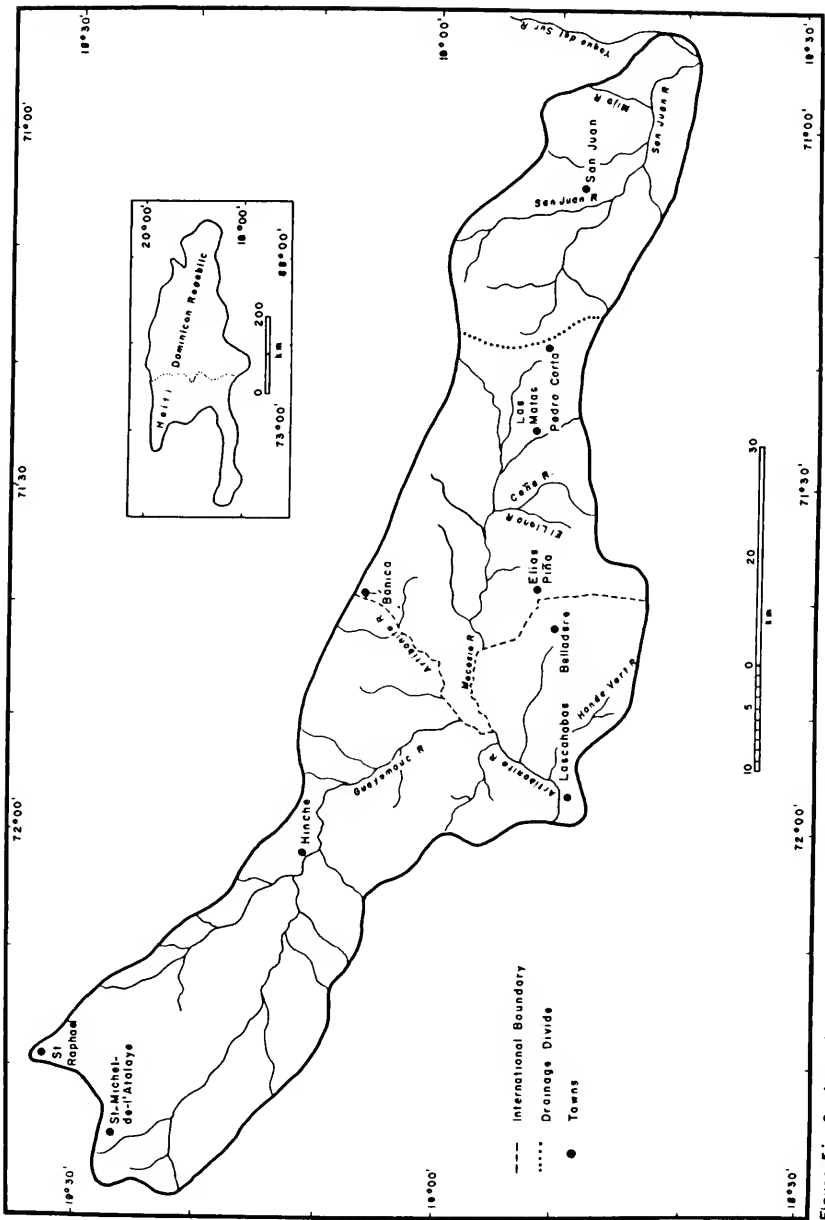


Figure 5: Surface Drainage, San Juan Valley-Central Plain

the entire region with the exception of a limited zone of basalts and andesites which emerge onto the valley floor from the mountains north of Las Matas de Farfán. The underlying sedimentary strata vary in age from Eocene to Recent. Rocks of Eocene age are limited to the limestone mountains to the south of Elias Piña. Oligocene limestones are found in the same mountains as well as in the northern and southern borders of the syncline. Miocene strata consisting of limestones, sandstones, schists, clays and conglomerates are the most common types of country rocks found within the study region. Pliocene sediments, consisting principally of unconsolidated sands and gravels, underlie the vicinity of Elias Piña. Rocks of Recent age compose the gravel terrace found in the eastern end of the San Juan Valley.¹⁰

The study region may be divided into four natural subregions based upon landforms and surficial lithology (Figure 6). Subregion I consists of alluvial plains and terraces. In Haiti, narrow floodplains adjoin the present-day rivers, while to the east in the San Juan Valley, alluvial soils and related landforms are found both near the Haitian border at Elias Piña and El Llano, and in the extreme east on the high gravel terrace near San Juan de la

¹⁰Organization of American States, Reconocimiento y evaluación de los recursos naturales de la República Dominicana, Mapas.

Organization of American States, Haïti, mission d'assistance technique intégrée, Cartes.

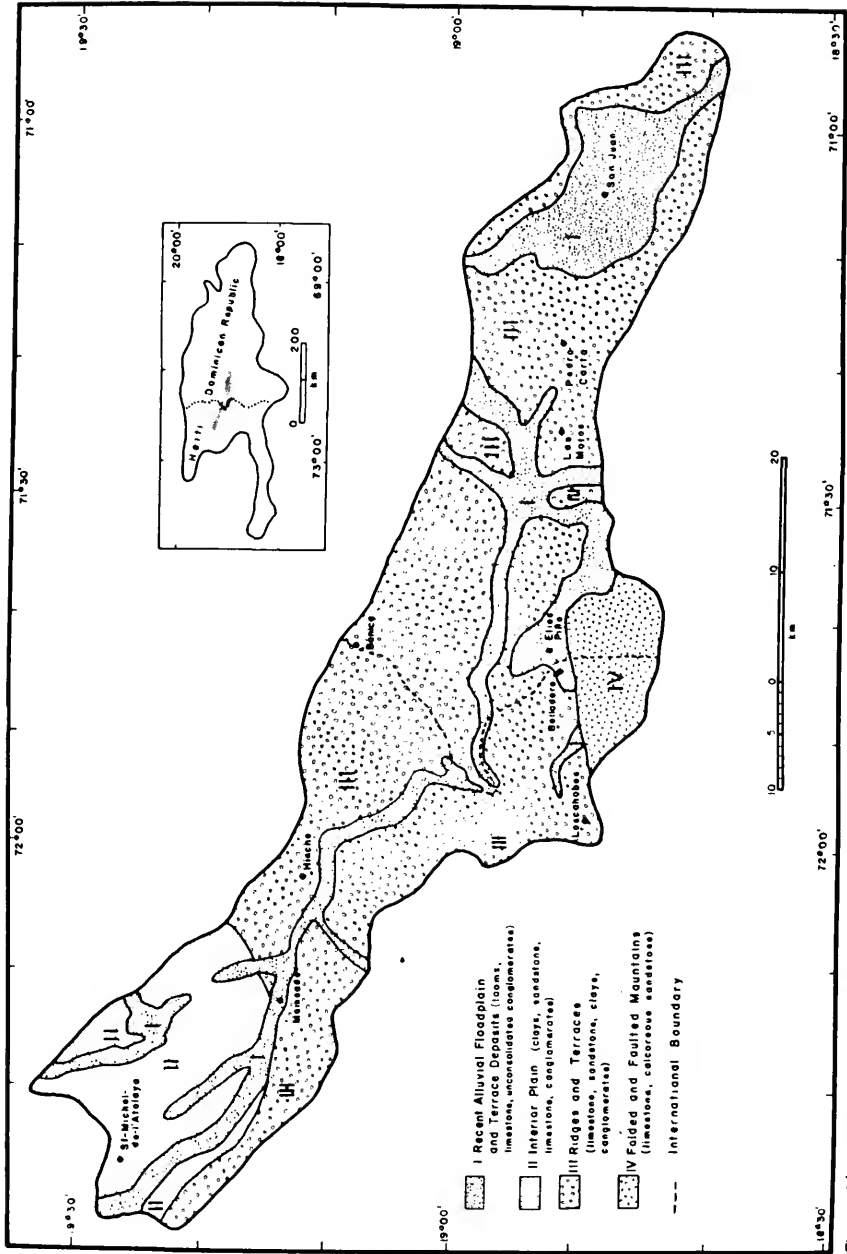


Figure 6: Natural Subregions, San Juan Valley-Central Plain

Maguana. Subregion I has deep, dark brown calcareous soils of high potential productivity. An impermeable strata underlying the soils near San Juan de la Maguana provides the pedologic conditions suitable for intensive irrigated rice production. Near El Llano, to the west, reduced water retention and increased soil permeability make irrigated rice cultivation a marginal endeavor.

Subregion II is a slightly undulating interior plain with stream-derived Pliocene gravels and silts resting on Miocene sedimentary rocks. Loamy soils broken by occasional patches of sand characterize this subregion. These soils are considered cultivable, but without irrigation they are not highly productive. The intermittent nature of the streams restricts the use of surface water for irrigation.

Subregion III covers most of the Valley-Plain; it is an area of ridge and terrace topography which becomes increasingly rugged in the vicinity of the Artibonite River. Local relative relief varies from five to thirty meters near Hinche in the central west. Around Belladere relative relief increases to 150 meters; in this area stream dissection has caused advanced erosion and has created a badlands topography. Soils in Subregion III are generally clayey in texture and vary from light to dark brown in color. Deforestation and continued cultivation have had a degenerative effect on the soils. The steeper slopes and summits have been denuded of their forest cover and soils have been eroded in many places exposing the underlying

rocks. Subsistence farming is the principal land use on the gentler slopes and on the colluvial slopewash of the gullies and depressions. As a rule, lack of soil moisture is the primary limitation to agricultural productivity in this subregion.

Subregion IV consists of folded and faulted mountains. At higher elevations, limestone outcrops often form a weathered, honeycomb pattern. This karst topography includes sinkholes and caverns. A most spectacular karst feature is the underground course of the Honde Vert River which emerges onto the plain from a cavern at the base of the escarpment near the Haitian town of Croix Fer about eight kilometers northwest of Belladere Town.

A permeable limestone country rock and higher amounts of rainfall due to orographic lifting have produced soils favorable for forest growth. Although fertile in an undisturbed state, the shallow soils are subject to rapid erosion where the vegetative cover is removed. On the Dominican side there still exist forested areas which, when initially cleared, are highly productive for food crops. On the Haitian side, however, the region is very sparsely forested with the remaining trees being used as a shade canopy for coffee growing. The most abrupt contrasts in natural vegetation between Haiti and the Dominican Republic consequently are found in this mountainous subregion.

Natural Vegetation

Four natural vegetation zones occur within the study region: open grassland; mixed grassland and thorn scrub; thorn scrub; and mixed coniferous-deciduous forest (Figure 9). It should be noted that this zonation is not always as abrupt as it appears on the map; in most instances there is some mixing of vegetation types in the transition from one zone to the next.

Zone I consists of open grassland located in the northwest portion of the Central Plain. It is one of the most extensive areas of this vegetation type on the island. The grassland is broken only by occasional narrow bands of scrub and small trees along the stream banks. Large trees are rare. Historical descriptions indicate that this grassland has remained relatively unchanged since early Spanish settlement.

In Zone II, the grassland becomes mixed with low thorn scrub. Among the characteristic scrub varieties are the tabac cimaron (Buddleja domingensis), guásimo (Guazuma ulmifolia), and the cactacea raqueta (Euphorbia lactea).¹¹As recently as the 1930s, mesquite or bayahonda (Prosopis juliflora) was the most common scrub, but it has been largely eliminated as a consequence of charcoal making. Principal

¹¹In describing the vegetation on the Haitian side, the Creole terms are used; for vegetation on the Dominican side, the Spanish is used. The Latin equivalent is given only the first time the term is used.

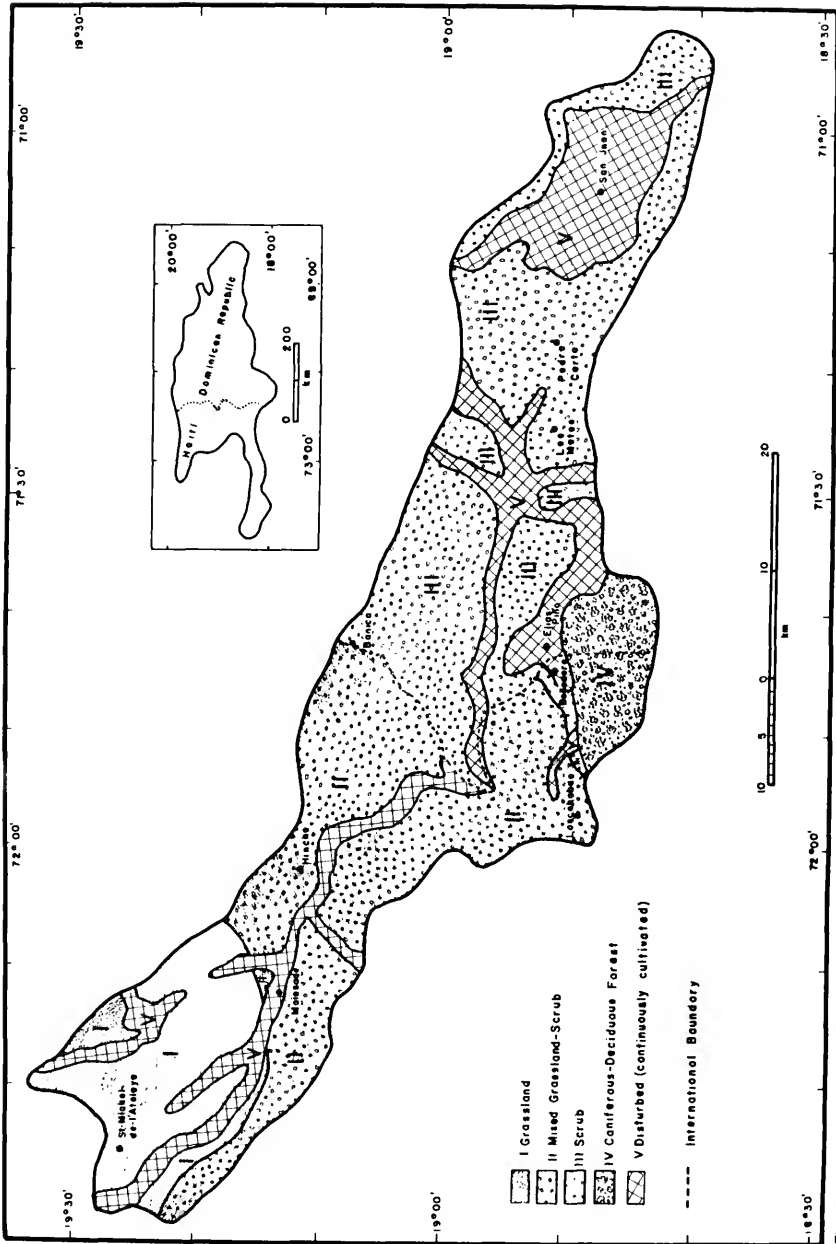


Figure 7: Natural Vegetation, San Juan Valley-Central Plain

grasses are the madame michel (Themeda quadrivalvis), zeb à coté (Panicum elepliantipes) and zeb guinée (Panicum maximum). Of these, the six-foot-high madame michel is the most characteristic and, because it is extremely coarse, the least valuable for grazing. Madame michel is dominant in the most rugged terrain and is considered an indicator of poor soil. It was relatively uncommon early in the present century before soil erosion became acute.

Zone II, unlike Zone I, was once forested; most of the deforestation has in fact occurred within memory of the older residents of the region. Common trees in the past were the pine or bois pin (Pinus occidentalis), mango (Mangifera indica), candelón (Acaia scleroxylon), campeche (Haematoxylon campechianum), bois cayman (Lonchocarpus ehrenbergii), bois de chen (Catalpa longissima), bois cabrit (Croton sidifolius), and guayacán (Guajacum officinalis). Today, the mango is by far the most common, having been spared because of its value as a food source. Most of the other trees can be found only in very small quantities. Several varieties, including casser hache (Aiayphus rhodoxylon), taverno (Lysiloma latisliqua) and bois de chen have disappeared entirely. In some parts of Zone II only occasional solitary pine trees stand amidst the scrub and grasses as reminders of the former forest cover (Figure 8).

The division between Zones II and III corresponds closely to the international boundary as the mixed scrub-savanna of the Haitian side abruptly changes to simply scrub



Figure 8: Scattered Pine Trees near Belladere

growth in Dominican territory. According to older Dominican informants, this dichotomy is of relatively recent origin; many parts of Zone III, particularly in the less fertile hilly terrain, were savanna-covered as recently as the 1920s. The disappearance of grassland on the Dominican side is the result of normal ecological succession under prolonged grazing and slash-burn cultivation. The contrast between Zone II and Zone III can be explained by the fact that much of the scrub on the Haitian landscape is continually cut back allowing the grasses to dominate.

Present-day scrub varieties in Zone III include bayahonda, tabaco cimarrón, and guásimo. Of these, the bayahonda is the most characteristic. The raqueta and cayuco (Cereus hystrix) are the most common cactaceae in this zone.

Formerly, the low-lying alluvial soils of Zone III were covered with montería or deciduous forest. Common trees in the past were the mango, caoba (Swietenia mahagoni), chácara (Cassia grandis), almácigo (Bursera simaruba), palo burro (Andira jamaicensis), jobo (Spondias purpurea), capá (Petitia domingensis), roble (Catalpa longililiqua), cedro (Cedrela odorata), and nogal (Juglans jamaicensis). Of these the cedro and nogal have entirely disappeared and the roble, chácara, caoba, capá and cajuil have become extremely rare. The remaining forest stands are found on the river banks where they have long been protected by law. Characteristic varieties on the present landscape are the mango, candelón, and guayacán.

Zone IV is a mixed coniferous-deciduous forest located in the south-central mountains of the study region. The most characteristic indicator of this zone is the pine; most lowland hardwoods are found here as well. Deforestation on the Haitian side has been extreme, but fortunately, coffee production has necessitated leaving a minimum number of trees for shade. Saw mills operating on the Dominican side during the early 1960s made inroads on the forest cover, but as clear-cutting was not practiced, the forest was not extensively damaged. The most destructive agent has been man, clearing off fields by burning.

Physical Features and Land Use

Lithology and geologic structure lead to distinctive landforms which, when acted upon by climate, produce characteristic vegetation zones. The use of the land, in turn, is dependent upon all of these factors. This may be illustrated in a systematic fashion by showing the interrelationships among geology, natural subregions, natural vegetation zones and land use in the study region (Figure 9).

It will be noted that the natural vegetation and land-use portions of the diagram show cross-border differences. The ridge-terrace terrain of natural subregion III, for example, yields vegetation which, because of interference by man, has developed quite differently in Haiti

| | | | | |
|---|------------------------------|-------------------------|-------------------------------------|--|
| Land Use Characteristics | Subsistence Agriculture | Subsistence Agriculture | Subsistence Agriculture | Coffee Production, Subsistence Agriculture |
| Natural Vegetation Zones | Commercial Agriculture | Commercial Agriculture | Commercial, Subsistence Agriculture | Subsistence Agriculture |
| Natural Subregions | Disturbed | Disturbed | Grassland | Grassland-Scrub |
| Geologic Units | Alluvial Plains And Terraces | Interior Plain | Ridges And Terraces | Complex Mountains |
| <p style="text-align: center;"> Pliocene-Recent (Unconsolidated Sands, Gravels) Miocene (Limestone, Sandstone, Clays, Conglomerata) Eocene-Oligocene (Limestones) </p> | | | | |

Figure 9: Interrelationships among Geology, Natural Subregions, Vegetation and Land Use

and in the Dominican Republic respectively. Similarly, the forested mountain zone is used on the Dominican side for subsistence agriculture and on the Haitian side for commercial coffee production. The designation "disturbed" in column I of the diagram indicates that the natural vegetation of the alluvial plains and terraces has been largely eliminated throughout the region. This is accounted for by the fact that the land is used for intensive agriculture and is in continual cultivation.

CHAPTER III
THE ERA OF SPANISH AND FRENCH COLONIZATION: 1492-1789

Events in the central borderlands during the period 1492 to 1789 were shaped primarily by the decline of the Spanish colony, the rise of the cattle trade along the western frontier, and the development of the French colony of Saint Domingue on the western third of the island. After a brief period of economic prosperity lasting until approximately 1530, the Spanish colony of Hispaniola declined rapidly owing to the exhaustion of its gold deposits and the decimation of the Indian labor supply.¹ Beginning in the 1530s and lasting throughout much of the period from 1492 to 1789, the colony suffered a steady loss of population to Spain's more prosperous possessions in Cuba, Peru and Mexico. With the growing importance of Spain's other colonies, Hispaniola fell into neglect and was relegated

¹The aborigines called the island Hayti or Quisqueya. Columbus named the entire island Española and this name was used until 1536. From 1536 until 1697, the island was called Santo Domingo. Then, with the ceding of the western part to France in 1697, the island was variously called Santo Domingo, Hispaniola or Saint Domingue. The name Hispaniola was used by some writers as early as the fifteenth century. In this study, to avoid confusion, the word Hispaniola will be used throughout.

to the role of a rest station for Spanish ships en route to Cuba or the American continent.

Many of the Spanish colonists who remained on Hispaniola turned to livestock raising as a less labor-intensive endeavor than mining, and this new industry rapidly became the economic mainstay of the colony. Stray cattle from the Spanish herds provided a livelihood for the buccaneers, groups of foreign adventurers, predominantly French in origin, who had taken refuge on Tortuga Island off the northwestern coast of Hispaniola in the early 1630s (Figure 10). French influence in western Hispaniola increased to such an extent that by the Treaty of Ryswick (1697) Spain ceded to France the western third of the island. From its beginning in 1697 until the Haitian Revolution of the 1790s, the French colony of Saint Domingue influenced events in the study region through growth of the sugar plantation economy and the development of overland trade between the two colonies.

Early Settlement

At the time of the Spanish Conquest in 1492, there were an estimated 1,200,000 aboriginal inhabitants on the island of Hispaniola, most of them living near the coasts.²

²Sauer quotes Peter Martyr as setting the number of aborigines at 1,200,000. (Carl Sauer, The Early Spanish Main [Berkeley and Los Angeles: University of California Press, 1966], p. 202.)

Sherborn F. Cook and Woodrow Borah, "The Aboriginal Population of Hispaniola," Essays in Population History (Berkeley: University of California Press, 1971), 1:376-410.

According to the early chroniclers, the central part of the island was sparsely populated and there is no evidence that the landscape had been significantly altered by man before the arrival of the Europeans.³

Earliest Spanish settlements on Hispaniola were concentrated in the gold-mining areas on the northern slopes of the central mountain chain in the Cibao Valley. The founding of the capital city of Santo Domingo on the more protected southern coast reduced the dominance of the northern settlements. The central portion of the island, however, remained of little importance during the early years of settlement and was known primarily as a link in the royal road or camino real which connected the northern and southern coasts.⁴

The first Spanish settlements in the study region were San Juan de la Maguana, Bánica and Hinchá (originally named Guaba, Nueva Guaba or Nueva Guayaba), all founded as frontier outposts in 1503 by Diego de Velasquez.⁵ Al-

³The following remarks by las Casas are typical of the early descriptions of the landscape of the island: "This land is a marvel to see because of its beauty and freshness and joy, fertility for all the crops which are produced here as well as for all of those from Castile," (Bartolomé de las Casas, La apologética historia sumaria [Edmundo O'Gorman, ed., Mexico: Universidad Nacional Autónoma de México, 1957], p. 31).

⁴One of the few colonial maps which shows the camino real is found in the following atlas:

M. L. E. Moreau de Saint-Mery, Recueil de vues des lieux principaux de la colonie française de Saint Domingue (Paris: M. Ponce, 1791).

⁵Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:253.

though none of the three settlements was listed among the cities and towns (ciudades y villas) existing in 1505-1506, they were relatively prosperous in the early years of the sixteenth century.⁶ San Juan de la Maguana owed its prosperity to the establishment of several sugar mills in the region in the 1550s.⁷ All three of the first settlements were listed in 1588 as parish seats; however, by that time they were declining along with the rest of the Spanish colony. López de Velasco, in 1574, listed San Juan de la Maguana among the depopulated towns of the colony.⁸

Settlement in the study region was greatly reduced by an edict from the Spanish Crown in 1603 and 1604 ordering the evacuation of a large portion of the western and north-western parts of the island in order to combat contraband. With broad authorization to destroy all suspected centers of illegal trade, colonial officials forced the evacuation of most of the Central Plain.⁹ Only Bánica remained as an isolated settlement in the San Juan Valley throughout the seventeenth century.

⁶Antonio Sánchez Valverde, Idea del valor de la isla Española (Ciudad Trujillo: Editora Montalvo, 1947), p. 94.

⁷Mervyn Ratekin, "The Early Sugar Industry in Española," Hispanic American Historical Review 34 (February 1954): 13.

⁸López de Velasco, "Geografía de la isla Española, 1574," 1:25.

⁹The principal centers of contraband were the northwest sea ports of Monte Cristi and Puerto Plata and the western town of Santa Maria de la Vera Paz, located on the site of Port-au-Prince. These towns were evacuated in 1604 and most of their inhabitants either emigrated to Cuba or formed the new towns of Monte Plata and Bayaguana near Santo Domingo city. In order to complete the evacuation of the Central Plain the following Royal Order of March 10,

Settlement of the study region proceeded at a much more rapid pace in the eighteenth century owing primarily to the establishment of the French colony of Saint Domingue in the western third of the island. After ceding the western territory to France in 1697, the Spanish government attempted to prevent further spread of French settlement by establishing new towns and outposts in the frontier region. As trade between the two colonies increased, frontier towns were founded as commercial centers. Hinchá was reestablished as a cattle raising center in the early 1700s and by 1724 it reportedly had a population of 4,500 persons.¹⁰ San Juan de la Maguana was resettled in the early 1700s as a center where the surrounding ranching population might gather for religious services.¹¹ The towns of Las Matas de Farfán and Pedro Corto were established in the late 1770s as ecclesiastical dependencies (ermitas or oratorios) in order to give the scattered population access to Mass.¹² Bánica, due to the attraction of its thermal baths, grew in population throughout the 1700s and was well known as a health spa.¹³

1605 was issued: "... that in order to eliminate the settlements of the smugglers which were not included in the original orders, do the same with all the rest, . . . so that not a trace will remain which might encourage our enemies to return to populate or fortify the region." (Emilio Rodríguez Demorizi, "Las devastaciones de 1605 y 1606," 2:123.)

¹⁰Saint-Mery, A Topographical and Political Description of the Spanish Part of Santo Domingo, 1:249.

¹¹Ibid., 1:253.

¹²Ibid.

¹³"The springs are surrounded by about 40 houses for the use of the persons who go there to take the baths the majority of whom are French." (Danial Lescallier, "Iti-

Early population counts illustrate the growth of settlement in the region during the eighteenth century. In the 1780s, the parish of San Juan de la Maguana reportedly had a population of 6,000; Bánica, along with its ecclesiastical dependencies of Las Matas de Farfán, Pedro Corto and Las Cahobas, had 9,000 inhabitants.¹⁴ The population of the area including Hinchá, San Miguel de la Atalaya and San Rafael was estimated at 12,000 in 1785.¹⁵ Moreau de Saint-Mery estimated the total population of the Central Plain and San Juan Valley in the 1780s to be 25,000.¹⁶

Ascendancy of the French

The evacuation of the western and northwestern parts of Hispaniola provided the opportunity for the French to extend their influence and to eventually gain possession of the western third of the island. French influence in western Hispaniola began in 1629 when a group of French and English adventurers established themselves as cattle hunters

nario de un viaje por la parte Española de la isla de Santo Domingo," in Relaciones geográficas de Santo Domingo, ed. Emilio Rodríguez Demorizi [Santo Domingo: Editora del Caribe, 1970], p. 136.)

So important were the baths to the French that during border negotiations in 1776, the French insisted that free access to Bánica be included as a clause in any border treaty. (Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:262.)

¹⁴Antonio del Monte y Tejada, Historia de Santo Domingo, 3 vols. (Santo Domingo: García Hermanos, 1890), 3:91.

¹⁵Sánchez Valverde, Idea del valor de la isla Española, p. 150.

¹⁶Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:279.

on the northwest coast of the island and began selling smoked meat to traders en route from Spain to the American mainland. They became known as boucaniers or buccaneers, a word derived from boucan which referred to the type of fire or wooden frame which they used for curing meat.¹⁷ By the middle of the seventeenth century the buccaneers had spread inland throughout the western portion of the island in search of stray cattle from the Spanish colony.¹⁸ A visitor to the island in 1678 wrote that, "... from Cape Lobos, which is in the middle of the island to Cape Tiburon which is in the far western extreme, one sees no other people but hunters."¹⁹

By 1650, the Spanish government considered the buccaneers such a danger that residents of the Spanish colony were prohibited from traveling to the west and northwest without government permission.²⁰ The Spanish sent numerous campaigns against the buccaneers but none was successful as they had become dispersed throughout the western interior of the island. In an effort to deprive them of their livelihood and thus drive them from the island, the Spanish sent troops to exterminate the wild cattle. This, however, had the unexpected effect of forcing the buccaneers to

¹⁷In present-day Haitian Creole the word boucan means a brush fire which the Haitian peasants use to burn the dried vegetation in their garden plots.

¹⁸Alcocer, "Relación sumaria, 1650," p. 209.

¹⁹Oexmelin, Histoire des aventuriers flibustiers qui se sont signalez dans les Indes, 1:70.

²⁰Alcocer, "Relación sumaria, 1650," p. 209.

establish agricultural communities. With the beginning of agriculture, the permanence of the new settlers was assured.²¹

Although the original groups of French and English buccaneers had been joined by adventurers of Dutch and Portuguese extraction, by the mid 1600s the French had become dominant. In 1665, the French government, recognizing the agricultural potential of the region, began sending administrators to govern the unofficial colony and, after gradually extending its influence France gained legal possession of the western third of the island through the Treaty of Ryswick in 1697.²²

The French colony of Saint Domingue rapidly developed into France's most valuable overseas possession. In 1699, long before the colony reached its height, no fewer than forty frigates traveled between Saint Domingue and France, while during the same period the Spanish colony of Santo Domingo was visited by an average of only one Spanish ship every three years.²³ By 1790, the population of Saint

²¹Raynal, A Philosophical and Political History of the Settlements of the Europeans in the East and West Indies, 3:289.

²²Tolentino Rojas, Historia de la división territorial, 1492-1943, p. 35.

France, the Netherlands, England and Spain signed the Treaty of Ryswick on September 20, 1697, ending the War of the Palatinate between England and France, and in so doing, acknowledged William II as King of England and Anne as his successor, restored the conquests of England and France in America and allowed France to retain Alsace in Europe.

²³Raynal, A Philosophical and Political History of the Europeans in the East and West Indies, 3:22.

Domingue had risen to 534,000 (480,000 black slaves, 24,000 free mulattoes, and 30,000 whites); in the same year, the population of the Spanish colony was about 125,000 (110,000 whites and 15,000 black slaves).²⁴

The population centers of Saint Domingue, located primarily on the coastal plains which were appropriate for plantation agriculture, had little direct influence on the interior. By the late 1700s, however, the borderlands were settled in part by escaped slaves or maroons from the French sugar plantations. It was estimated in 1751 that over 3,000 maroons inhabited the mountains of the interior.²⁵ Although they were scattered throughout the mountains, most of the escaped slaves lived in the vicinity of the present-day Dominican towns of Neiba and San José de Ocoa. Because of their contraband activities and other lawlessness, they were

²⁴Brian Edwards, An Historical Survey of the French Colony of St. Domingo (London: J. Stockdale, 1797), p. 2. Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:49.

Vaissière gives the following population figures for San Domingo in 1789: 30,000 whites, 450,000 blacks. (Pierre de Vaissière, Saint Domingue, la société et la vie créole sous l'ancien régime, 1629-1789 [Paris: Librairie Académique, 1909], p. 153.)

²⁵Theodore Lothrop Stoddard, The French Revolution in San Domingo (Boston and New York: Riverside Press, 1914), p. 63.

Yran Debbash, "Le marronage: essai sur la désertion de l'esclave antillais," L'Année Sociologique 3 (1961):1-112, (1962):117-195.

Gabriel Debien, "Les esclaves marrons à Saint Domingue en 1764," Jamaican Historical Review 142 (1961):9-20.

Richard Price, ed., Maroon Societies: Rebel Slave Communities in the Americas (New York: Anchor Press, 1973), pp. 135-429.

considered a menace by the French government and were frequently pursued and dispersed by military force. Although not specifically documented, it is most likely that some of these maroons took refuge in the hills and canyons of the central borderlands. Whatever their origins, settlers from the French colony were by the late 1700s the predominant influence in the western end of the Central Plain. In the 1780s Moreau de Saint-Mery noted about the towns of San Rafael and San Miguel de la Atalaya that, "... the Spanish racial features which originally occupied those lands have disappeared without leaving a trace in the region."²⁶

Throughout the eighteenth century it was the practice of each outgoing Spanish colonial governor to make a reconnaissance of the border to ascertain if there had been any French incursions during his administration. Often, however, this precaution was neglected and there resulted a gradual spill-over of settlers from the French to the Spanish side of the border. Thus began the illegal migrations to the Spanish territory, a process which was to continue into the twentieth century and become the chief source of friction between the two island nations.

The Treaty of Ryswick did not precisely demarcate the boundary between the two colonies. The new border was to follow the division between Spanish and French possessions

²⁶Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:255.

as they existed at the time of the signing. This was interpreted by the French as granting them the territory up to the Guayubín River, located about thirty-five kilometers within the territory of present-day Dominican Republic. The Spanish, however, insisted that the presence of long-established cattle ranches in that region made it part of the Spanish colony.²⁷ The disputed territory was the site of frequent violence until the signing in 1777 of the Treaty of Aranjuez, shifting the boundary line westward to a mutually agreeable position (Figure 10). Under the terms of both treaties, however, it was clear that the entire Central Plain was Spanish territory.

The Livestock Trade

The livestock trade, which supported the buccaneers and thereby led indirectly to the division of the island into two separate colonies, had its beginning soon after the Spanish conquest. The Spanish Crown granted repartimientos de indios, or the rights to the use of Indian laborers, for livestock raising as well as for mining.²⁸ By 1504, cattle raising had become an important economic enterprise, and colonists as well as many Spaniards who never expected to leave the mother country were soliciting

²⁷Monte y Tejada, Historia de Santo Domingo, 1:255.

²⁸Ibid., 2:33.

royal land grants or mercedes for cattle ranching.²⁹ The early cattle ranchers shipped cowhides to Spain and provided cured meat for outfitting Spanish exploration ships.

Early cattle grazing was limited to the mining areas of the Cibao Valley and the vicinity of the settlement of Santo Domingo. The San Juan Valley became a livestock producing region only after a government expedition of 1508 reported on its high grazing potential.³⁰ Rapid growth of the cattle trade occurred in the 1530s and 1540s as it replaced mining as the chief economic enterprise of the island. With the decline of the Indian population, cattle grazing offered the advantage of requiring relatively little labor. By the mid 1600s, the San Juan Valley was one of the major livestock regions of Hispaniola noted especially for its horses, mules and herds of wild and semi-wild cattle.³¹ Cattle herding was on an extensive basis. Large numbers of cattle strayed from the Spanish herds across the Central Plain and throughout the western part of the island, thus providing an easy prey for the buccaneers.³²

²⁹Ibid.

³⁰Ibid., 2:81.

³¹Alcocer, "Relación sumaria, 1650," 1:203.

³²Numerous colorful and intriguing descriptions of the early livestock herders have been preserved. It was reported that some of the herders owned their animals and others worked on a share basis, keeping a percentage of the new calves. Many lived on hog ranches and relied on trained dogs to guard the animals by day and return them to corrals at night.

"Their common exercise is to fight with wild animals, killing bulls with lances to get hides, domesticating wild horses and mules and killing hogs for meat. This type of life makes the people almost inhuman and rough, very few

With the founding of the French colony and the establishment of a growing plantation economy, there developed a reliable and expanding market for Spanish Santo Domingo's cattle and animal products. The French converted even their few grazing areas into cultivated zones.³³ As a result, the economy of the Spanish colony became increasingly dependent upon the livestock trade located along the western frontier. In return for horses, cattle (both for slaughter and for work), smoked beef, bacon and hides, the Spanish received such items of European manufacture as stockings, hats, linens, guns, hardware, and clothing.³⁴ In effect, an economic interdependence developed between the two territories.

There can be no doubt as to the importance of the livestock trade to the colony of Santo Domingo. Describing the Central Plain and San Juan Valley in the 1770s, Moreau de Saint-Mery wrote the following: "All that we have traversed and described from St. Raphael to the little Yaque (Yaque del Sur River) ... is at present for no other use than for breeding and raising cattle, intended in great part

of them plant even a small garden. Only those who have slaves plant any crops at all They live in the woods and fields in a barbarous manner in places which they call *bugios*." (Araujo y Rivera, "Descripción de la isla Española o de Santo Domingo, 1699," 1:305.)

³³Monte y Tejada, *Historia de Santo Domingo*, 3:67.

³⁴Raynal, *A Philosophical and Political History of the Settlements of the Europeans in the East and West Indies*, 4:239.

for the provisioning of the French colony"³⁵ Sánchez Valverde, in 1785, urged the Spanish government to support the cattle industry noting that it had been "... from the time of the beginning of our decline the only support for Española."³⁶

Coincident with the development of the livestock trade was the evolution of hatos or grazing ranches as the most prevalent type of landholding in the central borderlands. Livestock ranches were dedicated to the raising of horses and cattle on the open range. Moreau de Saint-Mery described the hatos simply as, "... immense possessions ... where horses and cattle are raised with little care."³⁷ In addition to grazing land, the hatos often included small subsistence agricultural plots, woodlands for supplying timber, palm groves for providing shade and food for the animals, and streams for watering the stock. Given the isolation of the study region, each hato had to be as self-sufficient as possible. It has been estimated that by the year 1650, one-third of the island was covered by hatos.³⁸

The Landscape: 1789

In the late 1700s, Lescallier traveled through the San Juan Valley and recorded his impressions of the land-

³⁵Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:279.

³⁶Sánchez Valverde, Idea del valor de la isla Española, p. 85.

³⁷Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:65.

³⁸Monte y Tejada, Historia de Santo Domingo, 3:17.

scape. He noted that San Juan de la Maguana was, "... quite important because of the large number of cattle and horses which grazed on the natural grasses of its beautiful savannahs."³⁹ He further observed that the eastern end of the valley was completely devoid of forest cover. There was no evidence of any type of cultivation. To the west of San Juan near Pedro Corto, the grasslands were gradually replaced by scrub (Figure 11). The aridity increased to such a point between Las Matas and Bánica that the landscape became "... a confusion of small, sandy and arid hills which formed a region so sad and monotonous as to make one disgusted."⁴⁰

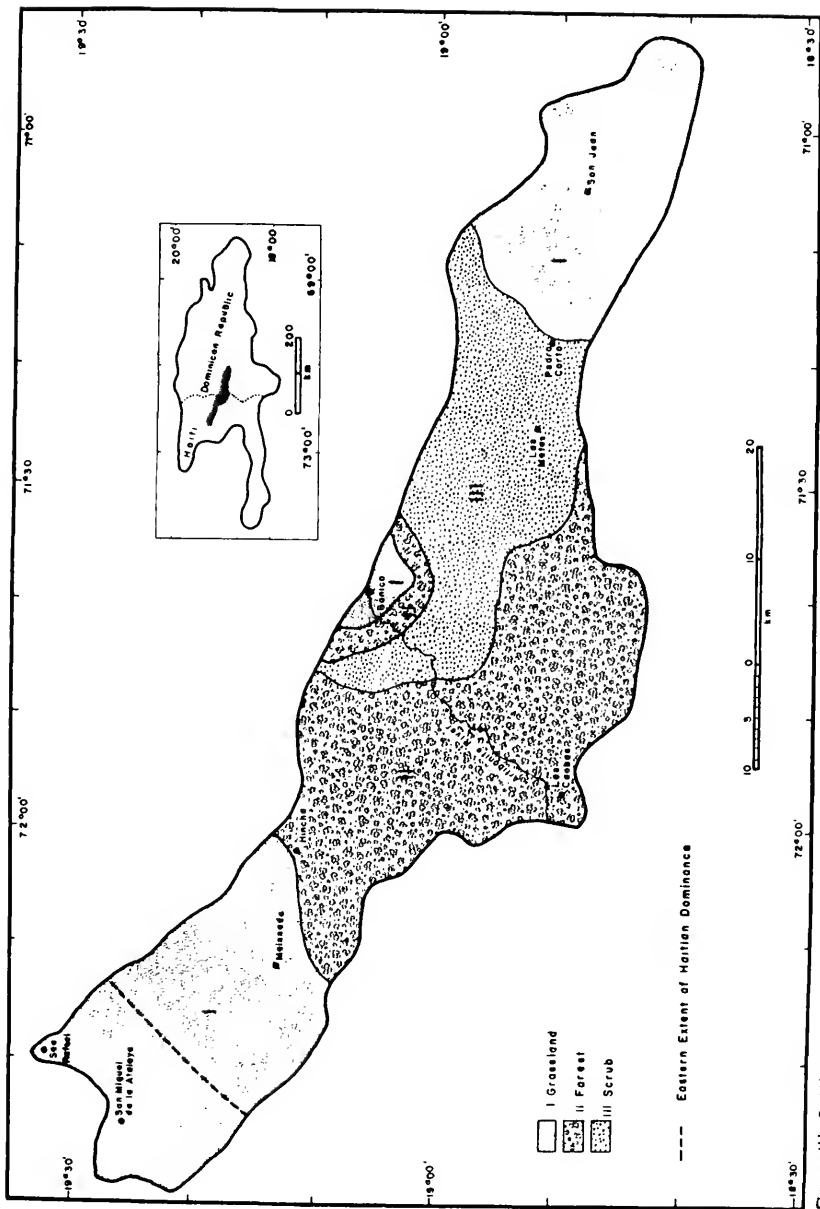
The town of Bánica was described in the 1780s as surrounded by a very small savanna which, in turn was surrounded by a high forest.⁴¹ Because of its aridity and poor soil, the region was considered less desirable for livestock than the grasslands of San Juan or those further to the west.

Descriptions of the Central Plain in the late 1700s mentioned the wide savanna stretching southeastward from San Miguel de la Atalaya. At a point between Maissade and Hinche, where the topography becomes more rugged and the floodplain gravels and silt of the valley floor give

³⁹Lescallier, "Itinario de un viaje por la parte Española de la isla de Santo Domingo," 1:136.

⁴⁰Ibid., 1:137.

⁴¹Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:65.



way to limestone hills and ridges, a sparse forest of hardwoods and pines became evident and extended eastward into Spanish territory. These woodlands were interspersed with grasslands which provided excellent forage for the open-range cattle. Heavily forested areas were limited to riverbanks and to the margins of the Plain.

Government Policies as Key Landscape Determinants

Government policies played a major role in the evolution of settlement and land use in the study region from 1492 to 1789. Although many of these policies were never intended to affect the borderlands, their effects were so far reaching that they have produced a long-lasting imprint.

Many of the Spanish colonial policies hampered the development of Hispaniola and contributed to its decline. Mercantilistic trade restrictions forbade trade with all but Spanish ships and limited commerce to the Spanish port of Seville.⁴² Ironically, it was in protecting their shipping monopoly in the Caribbean that the Spanish first routed the buccaneers from their illegal trade center on St. Kitts Island, from which place they fled to Tortuga Island and colonized northwest Hispaniola. Early population growth was inhibited by laws limiting immigration to

⁴²This was not entirely consistent. For example, between the years 1548 and 1555 the port of Puerto Plata was also used by Spanish ships. (Rodríguez Demorizi, "Las devastaciones de 1605 y 1606," 2:111.)

the Spanish province of Castile. Concentration on mining and the failure to develop a yeoman farmer class left the island's economy ill-prepared to survive the precipitous decline of the Indian labor supply. Although a principal cause of the extermination of the Indians was the introduction of European diseases, the callous Spanish labor policies also played an important role. The economic decline of the Spanish colony and the discovery of silver on the American mainland led to a general policy of laissez-faire by the Spanish government. Given the much greater potential of Mexico and Peru and the declining capacities of Spain to manage its expanding empire, the neglect of Hispaniola was inevitable. The result was the loss of western Hispaniola to the French.

Perhaps the policy which most directly affected the evolution of settlement in the study region was the evacuation of western and northwestern Hispaniola by the Spanish. Although the Spanish government recognized its mistake and reestablished the major towns in the eighteenth century, the over-all effects of the 1603-1604 depopulation edicts were long-lasting; the depopulated landscape of the San Juan Valley encouraged the expansion of French settlement. The evacuation of the Central Plain was responsible for the almost complete disappearance of Spanish influence in the study region.

Efforts by the Spanish government to drive out the buccaneers through a policy of exterminating the wild cattle

had the reverse effect and forced the French cattle hunters to begin relying on agriculture for a livelihood. This change to sedentary agriculture ensured the permanence of the buccaneers and attracted the attention of the French government to the agricultural possibilities of the island. The western territories had been of little value to the Spanish and constant clashes with the French usurpers had been a drain on the colonial economy. Growth of the new colony of Saint Domingue, however, soon surpassed even French expectations; after the late 1700s, settlers from the expanding French colony began to dominate the central borderlands. From that time onward, events in the study region were shaped by the juxtaposition of the two cultures.

Reliance on the livestock trade of the western frontier as the mainstay of the Spanish colonial economy set a precedent which was to continue in the study region throughout the succeeding nineteenth century. Open-range grazing continued throughout this period and little changed from past colonial practices. The exchange of cattle and animal products by the Spanish colonists for European manufactured goods from French Saint Domingue was a commercial pattern which remained virtually unchanged into the twentieth century. Livestock ranching encouraged dispersed settlement which came to characterize the region. The Spanish preference for herding or grazing--the tradition of the caballero--to the neglect of cultivation, was well established by the eighteenth century in the San Juan Valley

and has continued as is evidenced by the presence of large cattle ranches in the most fertile parts of the valley floor to the present day.

French policies were also important in shaping landscape development in the study region. Government encouragement of early buccaneer activities in the western part of Hispaniola led eventually to the establishment of the French colony of Saint Domingue.

The French colonial policy of focusing entirely on sugar production to the neglect of livestock raising had two effects on the borderlands. First, it greatly encouraged the frontier livestock industry of the Spanish colony. And second, by centering population entirely on the coastal plains, the French left the interior unexploited and available as refuge for the maroons.

The dispersed settlement pattern characteristic of the study region had its beginning not only with extensive cattle raising, as described above, but also with the flight of blacks from the harsh slave policies of the French.⁴³ Even those maroon bands located on the Spanish side of the border were composed almost entirely of escaped slaves from the French plantations rather than from Spanish establish-

⁴³According to Edwards, slavery was more severe in the French colonies than in either the British or Spanish colonies because the slaves were considered public property. As such, they were subject to the authority not only of their immediate master, but of any white. (Edwards, An Historical Survey of the French Colony of St. Domingo, p. 11.)

ments. Slavery in Saint Domingue was much more severe than in the Spanish colony where the slave was often a cattle herder and was given considerable freedom of movement. The severity of slavery in Saint Domingue--an official policy established only after long debate as to the relative economic advantages of mild and harsh treatment of slaves--led to the early dispersion of population into the most remote recesses and instilled in the Haitian peasant a preference for the dispersed rural settlement pattern which characterizes the landscape to the present day.

CHAPTER IV
THE HAITIAN REVOLUTION AND ITS AFTERMATH: 1790-1899

The period 1790 to 1899 on Hispaniola was marked by a complex series of political events, frequent changes of sovereignty and invasions by foreign powers (Appendix 3). Events in the study region were forged primarily by the Haitian Revolution which began in 1790 and by its aftermath of militarism and political turmoil.¹ The revolution brought about a new social order and a new system of landholding which radically altered the landscape of the Central Plain and indirectly that of the San Juan Valley throughout this historical period.

The Haitian Revolution was a complex social phenomenon the details of which go far beyond the scope of this study. In the fourteen years between the initial slave uprising in 1790 and the Haitian declaration of independence in 1804, the blacks of Haiti either killed or expelled most of the white plantation families, repelled an invading British army, briefly occupied Santo Domingo and withstood an attempt by Napoleon Bonaparte to regain the colony for France. The state of upheaval continued during the greater part of

¹For a well-researched study of the Haitian Revolution see Stoddard, The French Revolution in San Domingo.

the nineteenth century as the new Haitian Republic, under constant alert for a possible return of the French, attempted to ensure its independence and buttress its defenses against outside intervention. During much of the period, Haiti carried out a policy of aggression against the colony of Santo Domingo, launching repeated invasions from 1801 to 1856. This period of continued hostility set the stage for the second half of the century during which time the study region was the site of frequent border incidents and served as a refuge for bandits and revolutionaries from both nations.

Dispersion of the Haitian Population

The Haitian Revolution and its succeeding repercussions fostered migrations from the coastal plantations to the interior mountains and plains. Great numbers of newly freed slaves did not return to their home plantations after the initial uprising. Others returned only to find that the destruction of many of the irrigation systems during the revolt had left the plantations less capable of supporting dense populations.

Migrations continued under the first two Haitian rulers, L'Ouverture and Dessalines. Both rulers maintained a plantation system based on obligatory labor in an effort to restore the economy to the prosperity enjoyed under the French. All rural inhabitants were required to work on

plantations, generally those of their former masters, and were allowed very little freedom of movement. Although under L'Ouverture the severe measures succeeded to some extent in increasing agricultural production, production fell drastically during the rule of Dessalines.²

Many rural Haitians refused to accept a return to servitude and escaped to the interior where they became subsistence farmers. An early traveler wrote the following: "From the very harsh proceedings of Dessalines a great number left their homes and fled to the eastern part of the island and there lived in the woods and recesses of the mountains until they heard of his death."³ Another observer noted that the refugees, "... like the maroons of the neighboring islands, selected the most retired spots they could find in the mountains, where they fixed their residence, till the fear of discovery or the desire of change induced them to remove to other spots equally remote and secluded."⁴ Further migrations occurred as a result of

²For agricultural production figures during the early years of the Republic, see James C. Leyburn, The Haitian People (New Haven and London: Yale University Press, 1966), p. 320.

³Franklin, The Present State of Haiti, p. 325.

⁴Had the rule of Dessalines not been cut short after only three years, he might have achieved a yet more thorough dispersion of the population. His long-range plan was to relocate inland the coastal towns and villages, including Port-au-Prince and Cap Haitien, so that the Haitian economy would have been based on sugar, coffee, and cotton produced in the interior and marketed by special brokers who would have been the only ones to have contact with the outsiders. (Harvey, Sketches of Haiti from the Expulsion of the French to the Death of Christophe, p. 267.)

the forced labor system of Christophe who ruled in the northern part of Haiti after the death of Dessalines in 1806. Interior settlement during these early years of Haitian independence followed the same dispersed pattern begun by the maroons during the time of the French colony.

Beginning with the rule of Petion (1806-1818), settlement of the interior received government support. Petion and his successor Boyer (1818-1843) set a precedent for subsequent Haitian rulers, by distributing land throughout the interior as gifts to supporters and to soldiers in lieu of salary. In this manner new lands were opened to agriculture and, by mid-nineteenth century, all but the most uninhabitable regions were occupied.

Livestock Ranching and Border Trade

Livestock ranching along the frontier and the overland trade which had developed between the French and Spanish colonies were both almost eliminated during the period of Haitian invasions between 1801 and 1855.⁵ The invading forces lived off the spoils of the land by requiring each village to supply food and animals. The principal towns of the study region were repeatedly razed and the livestock

⁵Haitian strategy generally called for a two-pronged attack with one army invading through the Cibao Valley and the other through the Central Plain and San Juan Valley. Early invasions occurred in 1801 under L'Ouverture and in 1805 under Dessalines. Haitian forces occupied the entire island from 1822 to 1844; after being expelled from Santo Domingo in 1844, they again invaded in 1849, 1851, and 1855.

slaughtered by the Haitian armies both on the advance and retreat.⁶

The majority of the cattle ranchers or hateros either emigrated to other colonies or withdrew to the relative safety of Santo Domingo City. The hatos were abandoned and the cattle were allowed once again to revert to a wild state.⁷ Travelers to the island in the 1820's, during the Haitian occupation, reported that overland trade had all but disappeared.⁸

The spread of Haitian settlement eastward and the efforts of the occupation government to encourage miscegenation and spread Haitian influence on the island had its greatest effect on the cattle-raising areas of the borderlands where a blending of skin color, language and customs gradually began to dilute ethnic differences. Cattle herding by the 1830s was no longer limited to those

⁶The town of Comendador (later renamed Elias Piña) was the site of intensive fighting in 1845. In 1849, San Juan de la Maguana and Las Matas de Farfán were burned by retreating Haitian armies under President Solouque. Fighting occurred again in San Juan and Las Matas in 1851 and 1855. The final defeat of the Haitians came at the Battle of San Tomé situated to the west of San Juan in December, 1855.

⁷It was estimated that the invasions of 1801 and 1805 cost the Spanish colony 30,000 head of cattle, including breeding stock. (José Francisco de Heredia y Mieses, "Informe presentado al muy ilustrísimo ayuntamiento de Santo Domingo, capital de la isla Española, en 1822." In Invasiones haitianas de 1801, 1805, y 1822. Edited by Emilio Rodríguez Demorizi. Ciudad Trujillo: Editora del Caribe, 1955, p. 161.

⁸Many cattle were slaughtered during this period to provide meat for the slaves in Cuba. Such jerked meat was known in Cuba as tasajo. (Franklin, The Present State of Haiti, p. 297.)

of Spanish descent. A contemporary observer commented on the black cattle herdsmen of the frontier and described their way of life in the following manner: "In the vast solitudes of the interior the former (herdsmen) reside continually on horseback, with a lasso at their side, and a small case of cigars and a bottle of aguardiente at their saddle bow. The flesh of their cattle serves them for food, and the hides are sent to the different towns upon the coast to be exchanged for their favorite luxuries."⁹ With the abandonment of the hatos, frontier cattle ranching had reverted to a state only slightly more refined than the cattle hunting of the buccaneers. In overall terms the borderlands had retrogressed. A North American passing through the region in the 1830s noted that, "... a traveler can get nothing to eat because there is nothing to spare."¹⁰

Population Decline

The Haitian Revolution and the invasions that followed had a serious effect on the population of both Haiti and Santo Domingo. The Haitian population decreased by an estimated 100,000 persons between the years 1791 and 1805.¹¹ In order to increase the agricultural labor force, Dessalines and Christophe encouraged the return of blacks who had fled

⁹Brown, The History and Present Condition of Santo Domingo, p. 288.

¹⁰Ibid., p. 286.

¹¹Harvey, Sketches of Haiti from the Expulsion of the French to the Death of Christophe, p. 234.

with their masters to other islands or to Mexico and offered a reward to ship captains for each black whom they brought back to Haiti.¹² Free blacks from the United States were encouraged to immigrate and an unknown number did so.¹³

The colony of Santo Domingo lost a much greater percentage of its population. Mass emigration began with the first Haitian invasions of 1801 and 1805, the majority of emigrants fleeing to Venezuela, Colombia, Puerto Rico and, especially, to Cuba.¹⁴ During the French rule in Santo Domingo, exiles were encouraged to return by a guarantee of secure land titles. After a short time the properties of those who did not return were confiscated.¹⁵ An account written in 1812 of the depopulated condition of

¹²Ibid.

¹³The best source on black immigration from the United States is Ludwell L. Montague, Haiti and the United States, 1714-1938 (Durham, North Carolina: Duke University Press, 1940).

¹⁴The Cuban critic Manuel de la Cruz wrote about "those sons of the neighboring island of Santo Domingo who, upon immigrating to our country in the last years of the eighteenth century, were for some areas, particularly for Camagüey and Oriente, virtual civilizers." (Pedro Henríquez Ureña, "La cultura y las letras coloniales en Santo Domingo," Obra Crítica (Mexico and Buenos Aires: Fondo de Cultura Económica, 1960), p. 363.)

¹⁵The following was written in 1810 about the effects of the French occupation: "The grazing grounds were depopulated and laid waste, the dwellings suffered to decay, the negroes sent to other islands to be sold, the church plate melted down and the poor Spaniard bent under the rod of oppression." (William Walton, Present State of the Spanish Colonies, including a Particular Report of Hispaniola, 2 vols. [London: Longman, Hurst, Rees, Orme and Brown, 1810], 1:198.)

Santo Domingo noted simply that, "All of the Spanish population decided to emigrate to other lands, and the only ones who did not leave were those who absolutely could not do so."¹⁶ The exiles took with them their capital and many of those who later returned left their savings safely in foreign countries.¹⁷ Emigration continued during the Haitian occupation as the occupying government forced out large property owners in order to confiscate their holdings. Many exiles returned to Santo Domingo after 1844 only to flee again in the face of later invasions.¹⁸

Overall population figures for the colony of Santo Domingo indirectly indicate conditions in the San Juan Valley. For the colony as a whole, population fell from an estimated 125,000 in 1789 to about 63,000 in 1819.¹⁹ The

¹⁶Heredia y Mieses, "Informe presentado al muy ilustrísimo ayuntamiento de Santo Domingo, capital de la isla Española, en 1822," p. 162.

¹⁷"The island lost the greater part of its civilized and hard-working population, and almost all of the capital which circulated in the colony and encouraged its industries was lost with them." Ibid.

¹⁸The following is from a dispatch by Jonathan Elliot to United States Secretary of State Buchanan during the Haitian Invasion of 1848: "The Haitian Army are close upon us. Almost all of the foremost merchants have packed up their goods and shipped them to the neighboring islands before leaving with their families. The town is filled with women and children from the country and famine is to be apprehended The President has told me that it is his intention to set fire to the place in case they cannot hold out against the Haitians." (Sumner Wells, Naboth's Vineyard: The Dominican Republic, 1844-1924, 2 vols. [Mamaroneck, New York: Paul P. Appel, 1966], 1:89.)

¹⁹Saint-Mery, A Topographical and Political Description of the Spanish Part of Saint Domingo, 1:3.

The figures for 1819 are from the census of 1819 as reported in Harmannus Hoetink, "Materiales para el estudio

number had risen to 130,000 by 1841 as a result of immigration of Haitians during the occupation.²⁰ By 1863, the population had climbed to an estimated 207,700, indicating a rapid growth after the last of the Haitian invasions or perhaps an indication that emigration had been less massive during the later invasions than during the earlier hostilities.²¹ The San Juan Valley, unprotected and in the direct path of the invasions, was practically abandoned by mid-nineteenth century. By the 1860s, however, a process of resettlement had begun.

Haitian Dominance in the Central Plain

As a result of the Haitian Revolution and subsequent invasions, Haiti gained possession of the entire Central Plain. As noted earlier, Haitian influence was evident in the extreme western portion of the plain as early as the 1780s. By 1794, the Haitians were in control of San Miguel de Atalaya and San Rafael, and by 1809, the two towns were entirely Haitian.²² In 1821, the Central Plain was included

de la República Dominicana en la segunda mitad del siglo XIX," Caribbean Studies, vol. 5, no. 3 (1965):3.

²⁰Candler, Brief Notices of Hayti with its Conditions, Resources and Prospects, p. 132.

²¹Estimate made by an ecclesiastical tribunal, reported in Hoetink, "Materiales para el estudio de la República Dominicana en la segunda mitad del siglo XIX," Caribbean Studies, vol. 5, no. 3 (1965):3.

²²The following letter written by a Spanish resident of the area in 1794 confirms the early Haitian influence: "The negroes are in charge of San Rafael and San Miguel; those places are desolated; they go without opposition in

in a new division of the Republic of Haiti.²³ When the Haitian armies were driven from Santo Domingo in 1844, they remained in control of the towns of Hincha, Las Cahobas, San Miguel de la Atalaya and San Rafael, and a wide area of the Central Plain which had been entirely within Spanish territory under both the Treaty of Ryswick in 1697 and the Treaty of Aranjuez in 1777.²⁴

Preoccupation with internal political turmoil during the latter half of the nineteenth century prevented the Dominican government from launching the kind of protest which might have dislodged the Haitian settlers.²⁵ By the last

the mountains and could well take over Hincha, Bánica...." From a letter written by Don Esteban Polomares to Marqués de Casa Calvo, reprinted in El Sol, 8 March 1972.

²³Moisés García Mella, La cuestión de límites (Santo Domingo: n.p., 1923), p. 44.

²⁴Haitian claims to the Central Plain were based on the contention that when the area was first occupied by the Haitians, the entire island was united under French rule (Toussaint had maintained nominal allegiance to France) and that previous border treaties were, therefore, nullified. A more persuasive argument was that the region had been abandoned by the Spanish colonists. Authorities in Santo Domingo, however, insisted that the Central Plain towns of Hincha, Las Cahobas, San Rafael and San Miguel had regularly sent representatives to the constituent assemblies in Santo Domingo, thus proving their loyalty to the Spanish colony and indicating that they were never abandoned. In addition, in 1867, the two countries signed an agreement which read in part, "A special treaty will be worked out later to demarcate the limits of both countries. Meanwhile, they will maintain their current possessions." The Dominican point of view was that by signing this treaty the Haitian government was conceding that the boundary was only temporary. (García Mella, La cuestión de límites, pp. 11 and 49.)

²⁵After gaining its independence from Haiti in 1844, the former Spanish colony went through a period of extreme political vacillation and was finally annexed again to Spain in 1861. After five years, however, independence was

decades of the century, it had become clear that this frontier territory would remain under Haitian rule. The problem then became one of arriving at a settlement which would recognize the Haitian hegemony over the region but at the same time would provide adequate indemnity to the Dominican government. Attempts at arbitration in the closing years of the century failed to arrive at such a solution.

The eastern fringe of Haitian settlement did not end in the Central Plain but continued eastward into the San Juan Valley as well. In 1885, Bonó warned that the frontier was, "exposed to a perpetual and progressive invasion of foreigners (Haitians) which is daily reducing the influence of the Dominicans who, unarmed and exhausted, will disappear completely from that region."²⁶ In response to this warning, Billini suggested that the Haitian influx be stopped based on the same grounds used by the United States for limiting Asian immigration.²⁷

Haitian immigration to the Dominican Republic increased between 1875 and 1900 as a result of the modernization of the sugar industry. The war in Cuba had encouraged

once again achieved. In this study, to avoid confusion, the name Dominican Republic will be used for the country after it regained independence in 1865.

²⁶Emilio Rodríguez Demorizi, ed., Papeles de Pedro F. Bonó (Santo Domingo: Editora del Caribe, 1964), p. 251.

²⁷Hoetink, "Materiales para el estudio de la República Dominicana en la segunda mitad del siglo XIX," Caribbean Studies, vol. 7, no. 3 (1967):17.

many Cuban sugar growers to settle in Santo Domingo and they had brought with them their technical know-how and capital. As had already happened in Cuba and Puerto Rico, the traditional animal-powered sugar mills were replaced by modern factories or ingenios which required great amounts of seasonal labor. Because of the lack of roads, organized transport of Haitian cane workers was by ship; however, increasingly Haitian job hunters began making the overland trek across the border to the Dominican sugar fields. Many of these seasonal cane cutters established subsistence farms along the frontier. In this manner Haitian influence continued to spread eastward.

As the central borderlands became increasingly Haitian in culture during the nineteenth century, a most important fact became evident which was to greatly influence the course of future events in the region. The borderlands were located closer to the population centers of Haiti than to those of the Dominican Republic. Port-au-Prince, located only two days by horseback from the western end of the San Juan Valley, became much better known to valley residents than their own capital city of Santo Domingo which was five to six days' journey away. Until good roads were built linking the San Juan Valley with Santo Domingo City, frontier commerce would be directed much more to Port-au-Prince and Cap Haitien than to Dominican population centers.

Types of Landholdings and Land Tenure

The Haitian Revolution brought about significant changes in landholding patterns. After initial attempts to maintain the plantation system, Haitian presidents, beginning with Petion in 1806, followed a policy of distributing state lands in plots as small as six hectares.²⁸ Petion made such grants primarily as payment for military service.²⁹ Following Petion, Boyer offered to all farmers clear title to lands which they had in cultivation.³⁰ As a single farmer was capable of cultivating only one or two hectares at a time, these land grants were very small. Later presidents, particularly Saget (1870-1874) and Solomon (1879-1888), distributed plots as small as four hectares.³¹

The rationale for the abrupt change from a plantation system to an emphasis on small properties was three-fold. Ownership of land was thought to promote loyalty to the government and to instil in the people a love of country.

²⁸"Haiti abounds with these small proprietors, their patches of land, with their huts upon them, are generally situated in the mountains, in the recesses, or on the most elevated parts, on spots, as the poet has described, 'The most inaccessible by the shepherds trod'." (Franklin, The Present State of Haiti, p. 345.)

²⁹Petion authorized the following land grants: 35 carreaux to battalion leaders; 30 carreaux to captains; 25 carreaux to lieutenants; 20 carreaux to sub-lieutenants; 5 carreaux to common solders (one carreau = 1.29 hectares). (Thoby, La cuestión agraire en Haïti, p. 9.)

³⁰Frank Marino Hernández, La inmigración haitiana (Santo Domingo: Ediciones Sargazo, 1973), p. 15.

³¹Raymond Renaud, La régime foncier en Haïti (Paris: F. Loviton & Co., 1934), p. 42.

In addition, it was believed that public lands were being abused and that by putting these lands in the hands of the people as proprietors they would be maintained and preserved.³² Finally, dividing the land into small parcels was viewed as insurance against a return to a foreign-dominated plantation economy.

It has been estimated that between 1807 and 1843 Petion and Boyer created over 8,000 new landholdings of six hectares each.³³ A contemporary observer estimated the number of small properties in 1841, without giving the individual size, to be 46,610 and stated that one out of three heads of family was a landowner.³⁴ The same writer noted that, "land was given on mountain passes, where no cultivation had ever before been carried on," an ominous portent of the future effects of such land distribution.³⁵

Under the system of equal inheritance, adopted from the French Napoleonic Code, landholdings were increasingly divided by each subsequent generation. Further fragmentation occurred as a result of a law stipulating that illegitimate children were entitled to a much smaller percentage of the inheritance than were legitimate children.³⁶

³²The following is from a Senate speech by Petion, April 26, 1814: "... to augment the number of landowners is to give a real and solid existence to the fatherland." (Thoby, *La question agraire en Haïti*, p. 8.)

³³Renaud, *La régime foncier en Haïti*, p. 93.

³⁴Candler, *Brief Notices of Hayti with its Conditions, Resources and Prospects*, p. 122.

³⁵*Ibid.*

³⁶Renaud, *La régime foncier en Haïti*, p. 147.

With each generation the landholding system became more confused, and although a nation-wide cadastral survey was proposed as early as 1870, it was never carried out.³⁷

By the late nineteenth century, Haiti was known as a land of the small proprietor. Little if any arable land remained unused. The study region, along with the rest of the country, had been divided into ever smaller private properties. As late as 1861 in a publication designed to attract immigration by former slaves from the United States, it was stated that large tracts of state-owned land were still available in the Central Plain near Las Cahobas.³⁸ By the turn of the century, however, state lands were rare, and most of those that could be found were occupied by squatters.

By the late nineteenth century the landholding pattern of the Dominican Republic was only slightly less chaotic than that of Haiti. Beginning in the seventeenth century, hatos, as well as other properties, had been passed from generation to generation in the form of communal lands or terrenos comuneros.³⁹ Under this system of inheritance, rather than receiving a specific portion of an estate, each

³⁷In addition to the small size of the holdings, there were other complicating factors which made it difficult to trace titles or prove ownership. Illegitimate children often took their mothers' names rather than their fathers'. Very often men transmitted their first names rather than their last names to their children. It is said that family names were often forgotten after several generations. (Renaud, Le régime foncier en Haïti, pp. 146-147.)

³⁸James Redpath, A Guide to Haiti (1861; reprint ed., Westport, Connecticut: Negro University Press, 1970), p. 112.

³⁹Monte y Tejada, Historia de Santo Domingo, p. 19.

heir was given a share of the property known as a peso de posesión which entitled the owner to use any portion of the land not already occupied. Several factors led to the system of communal lands, among them the scarcity of surveyors and the high cost of surveying. The principal reason, however, was the difficulty of dividing a large hato into smaller units while still retaining the necessary constituent parts of grasslands, timberlands and water in each of the smaller land parcels.⁴⁰

By the eighteenth century many hatos had evolved into communal lands with numerous owners or shareholders. With each generation land titles and boundary lines, many of which were ill-defined in the beginning, became more vague. Land titles were further confused as non-family members were allowed to purchase shares of communal lands. In the central borderlands, however, owing to the abundance of land and the sparseness of population, the chaotic landholding pattern caused fewer problems than in the more populous areas of the island.

The Church and the State were the largest landholders during the nineteenth century in the Dominican Republic. The State acquired large tracts when, after the expulsion of the Haitians in 1844, all lands expropriated by the occupation forces were transferred to the new government.⁴¹

⁴⁰Hazard, Santo Domingo, Past and Present with a Glance at Hayti, p. 483.

⁴¹Harmannus Hoetink, El Pueblo Dominicano: 1850-1900 (Santiago, Dominican Republic: Universidad Católica Madre y Maestra, 1971), p. 20.

Another type of landholding, the ejido, was the property of the municipal governments or ayuntamientos, and it was often rented to individual farmers. The traditional hato, a few of which covered as much as 400 hectares, remained the most important economic form of landholding and the one that covered the largest area. Numerically, however, the most common type of landholding by the 1870s was the small property.⁴² By the late nineteenth century, therefore, although extensive cattle ranching still characterized the landscape of the San Juan Valley, small landholdings devoted to subsistence farming and sugar cane growing, were becoming activities of increasing importance in the Dominican borderlands region.

The Landscape: 1899

Owing to political problems and frequent border incidents along the frontier during the late nineteenth century, there are relatively few detailed descriptions of land use and settlement during that period. The American geologist, Gabb, was unable to work in the San Juan Valley in the 1870s because of the disturbed political condition and was able to report only that President Báez had described the region as covered with lush grasses. The United States

⁴²U.S. Commission of Inquiry to Santo Domingo, Informe de la Comisión de Investigación de los Estados Unidos en Santo Domingo en 1871 (Ciudad Trujillo: Editora Montalvo, 1960), p. 469.

Commission of Inquiry which was sent to Santo Domingo in 1871 avoided the frontier region because of Haitian outlaw bands. Contemporary Dominican geographers treated the region very briefly and described it as used primarily for livestock raising. As mentioned earlier, it is known that subsistence farming had been introduced into the region changing the principal land use from simply grazing to mixed grazing and agriculture. There is no evidence, however, of significant changes in the patterns of land cover in the San Juan Valley between 1789 and 1899.

In contrast to the Dominican side of the frontier, the Central Plain of Haiti had undergone widespread landscape change. Rapid population growth had led to the deforestation of a large portion of the region (Figure 12). Much of the woodlands zone which had stretched from near Maissade eastward to the Dominican border had been converted to scrub or grassland mixed with sparse forest growth.⁴³ As on the Dominican side of the border, the principal land use on the Haitian side was mixed grazing and subsistence agriculture with each subsistence plot carefully fenced against the freely-ranging cattle.

⁴³Woodring, Brown and Burbank, Geology of the Republic of Haiti, p. 64.

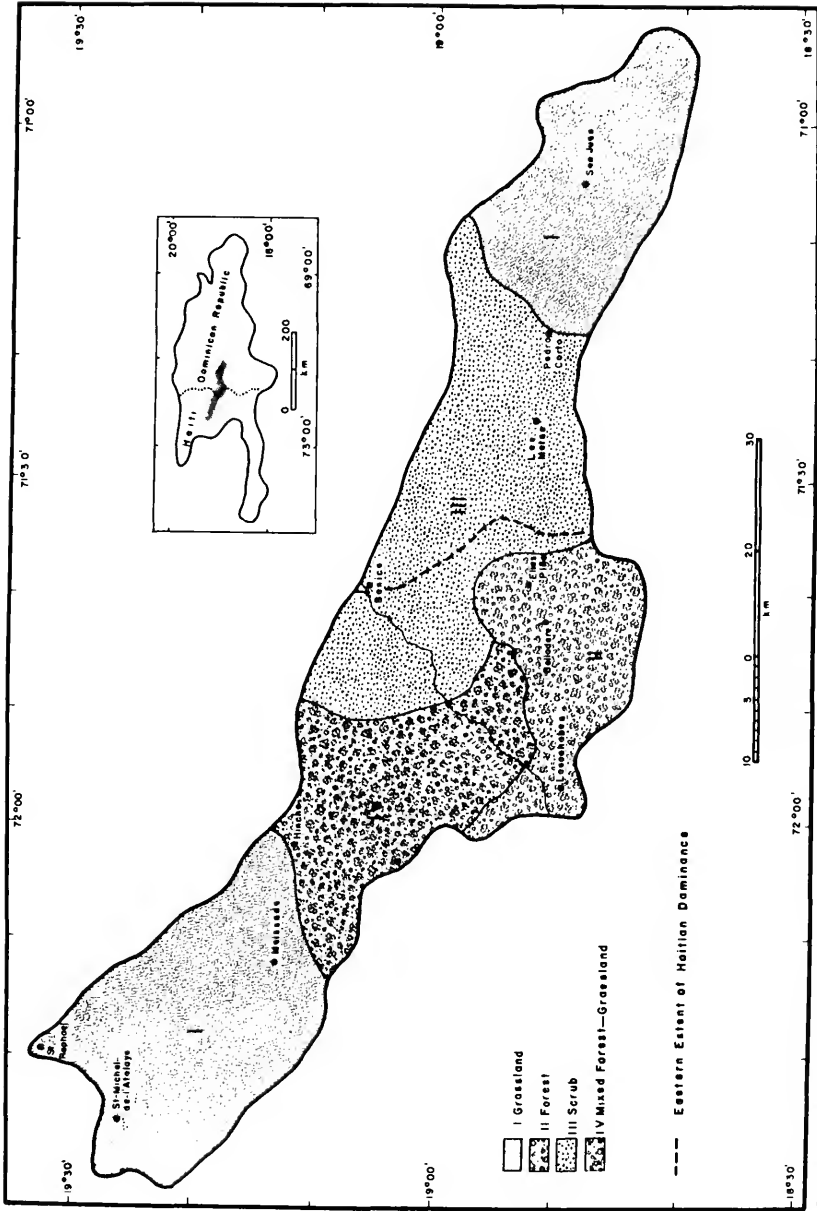


Figure 12: Settlement And Land Cover, San Juan Valley-Central Plain: 1899

Government Policies as Key Landscape Determinants

Government policies from 1790 to 1899 had long-ranging effects on the contrasting patterns of land use and settlement in the central border region. Most policies were related to the Haitian Revolution and the period of Haitian aggression. Events during that time produced the physical and cultural changes which continued to affect the borderlands inhabitants throughout succeeding periods.

Although the Haitian Revolution cannot be attributed to any single cause, its sanguinary nature and the complete rejection of the plantation system were unquestionably related to the severity of French colonial policies. Just as flight from slavery gave rise to the early maroon activities in the borderlands, so too flight from possible return to the plantation system led to further settlement of the interior and the gradual dominance of Haitian culture within the Central Plain.

Dispersion of settlement was further stimulated by the forced labor policies of the three Haitian rulers L'Ouverture, Dessalines and Christophe. Succeeding rulers, beginning with Petion, legitimized settlement of the interior by distributing small landholdings throughout the new nation.

Dominican government policies, particularly regarding conscription into the army, encouraged dispersed settlement patterns to the east. Under the conscription laws of the

late nineteenth century, all unmarried men over fifteen years of age were subject to military service. According to one contemporary observer, efforts to avoid military service led to the abandonment of agricultural land near population centers as "the inhabitants built their dwellings dispersed and in the most impenetrable regions."⁴⁴

Evolution of the small property as the dominant form of rural landholding set Haiti apart from most other countries of the Western Hemisphere including the Dominican Republic. Small holdings proliferated in the Central Plain and most were used for subsistence farming under a slash-and-burn system of land preparation. The combination of very small holdings, primitive methods, precipitous terrain and government neglect promoted deforestation and accelerating soil erosion which has characterized the landscape to the present time.

The San Juan Valley was spared such depletion of its natural resources because of its more level terrain, sparse population and emphasis on large-scale ranching as opposed to small-scale subsistence farming. The origin of the large landholdings can be traced to the Spanish land grant policy. Perpetuation of the large property system was encouraged indirectly during the Haitian occupation by the Rural Code obligating all non-landed peasants to attach

⁴⁴Emilio Rodríguez Demorizi, Hostos en Santo Domingo, 2 vols. (Ciudad Trujillo: Imp. J. R. García, 1939), 1:285.

themselves to large or medium-sized agricultural properties as salaried laborers. The law had little effect on landholdings in Haiti where the small property was already dominant, but in the former Spanish colony it significantly retarded the development of a system of small landholdings. It was only in the late nineteenth century that small holdings grew in number and subsistence farms began to encroach on the open range. The development of large landholdings within the San Juan Valley, as opposed to the small holdings of the Central Plain, was of utmost importance in the evolution of land use and settlement patterns in the study region.

The aggressive policies of the early Haitian governments contributed to the continued decline of the Spanish colony by causing large-scale out-migrations. In effect, the San Juan Valley, in its depopulated and under-utilized condition, was held in reserve. The processes of deforestation and soil erosion, which were beginning to occur in the more heavily settled Haitian areas, were delayed on the eastern side of the frontier.

The eastward movement of Haitian settlement and the Haitianization policy, by which the occupation forces attempted to thoroughly miscegenate the two peoples, created a racial, cultural and linguistic assemblage which was especially well-defined and long-lasting along the frontier. With the evacuation of the San Juan Valley by a large number

of the Spanish-speaking settlers, the spread of Haitian influence was unopposed. After the Haitian occupation of the Central Plain, such Spanish place names as Hinchá and San Miguel de la Atalaya along with dozens of others were altered to more closely approximate their French or Creole pronunciation, as in "Hinche" and "Saint-Michel-de-l'Atalaye." With the exception of the Spanish-derived place names, Spanish influence all but disappeared from the region.

Haitian aggressions and particularly the Haitianization policy during the 1822-1844 occupation, left a legacy of distrust and animosity, especially in the Dominican attitudes toward the Haitians. This attitude has seriously affected border relations from that time onward. All efforts at cooperation between the two sides, whether on a national or local scale, have had to contend with such antecedent, negative attitudes.

Agricultural development in Haiti was severely retarded by the militaristic policies of the early Haitian governments. Money which might have been used to support agriculture was spent for arms to supply a large army.⁴⁵ Conscription of males between the ages of sixteen and sixty took thousands of farmers away from their fields. An observer in the 1830s noted the following: "While columns of

⁴⁵Brown, The History and Present Condition of Santo Domingo, p. 268.

ragged soldiers are traversing the country in battle array, agriculture lies desolate and cultivated tracts grow up into a waste of thicket."⁴⁶ Throughout the nineteenth century agriculture was allowed to develop with little or no government direction or control. A policy of inaction toward the farm sector was thus established.

⁴⁶Observers in the nineteenth century noted the apparent haphazard approach to agriculture of the Haitian peasant. "There is nothing regular in his system; it is an anomaly, a strange incongruous method of proceeding having no tendency either to improve the soil or benefit himself He considers not whether one field is better adapted for the production of canes than another but plants indiscriminately in bad or good soil, in heavy or light; in fact he knows not whether it ought to be planted in canes or cotton, or it would be wise to allow it to become common pasture."

The same author commented that coffee trees were no longer tended but were allowed to grow wild, a condition which has continued to the present day. (Franklin, The Present State of Haiti, p. 351.)

CHAPTER V
MODERNIZATION AND DEVELOPMENT: 1900-1961

The period of relative political tranquility which began with the Dominican ruler Heureaux (1880-1899), continued during the early years of the present century and encouraged a rapid influx of settlers along both sides of the frontier. In the early years of this century, farming gradually replaced ranching as the principal economic activity. By the late 1930s the cash cropping of rice and peanuts had become dominant along the valley near Elias Piña.

In Belladere, on the other hand, subsistence agriculture continued to dominate farming activities in the lowlands, while commercial coffee production became established in the mountain zone. Among the factors which influenced the evolution of these land-use patterns were the final demarcation of the boundary, the expulsion of the illegal Haitian aliens from Dominican territory, the frontier policies of the Trujillo government, and the short-lived frontier project of the Haitian government. The influence of the Dominican dictator, Rafael Trujillo, was so pervasive during the 1930 to 1961 period, that the end of

his regime marked a turning point in the development of the borderlands region.

Settlement of the Border Dispute

Frontier problems, particularly the question of legal control over the Central Plain, remained unresolved during the first three decades of the present century despite arbitration by the Pope (1895 and 1901) and by the World Court in 1911. Open warfare was narrowly averted during the Dominican revolutions of 1911 and 1912 when revolutionaries used the disputed territory as a refuge. The United States arbitrated the matter in 1912, declaring valid the boundary line as it existed in 1905, that is, roughly the limit to which the Haitians had withdrawn in 1844. Both nations accepted this temporary settlement until such time as a mutually agreeable boundary could be determined.

In 1929, after long negotiations, Dominican and Haitian officials reached agreement on a new international boundary. The treaty recognized Haitian hegemony over the Central Plain but called for the return of Macasia, an area of about sixty square kilometers, to the Dominican Republic. Although both governments agreed to the treaty, the joint commission which attempted to demarcate the new boundary in the field was unable to reach agreement on several critical points. At the same time, public opinion in Port-au-Prince was strongly against the treaty because it was known that

Haitian engineers had been equipped with inadequate maps of the border region (Figure 13).

The two governments arrived at a final settlement in the "Protocol of 1935" which demarcated the border as it stands at present. All of the Dominican demands were met and Macasia became Dominican territory. Yet in practical terms there was no immediate change; the border remained open and overland trade continued as before. The new border agreement caused no displacement of people from one side of the border to the other.

Although both Haiti and the Dominican Republic ratified the protocol agreement, succeeding Haitian governments have been dissatisfied with the results. The official position of the Duvalier government has been that Haiti was unrightfully deprived of 60,000 hectares of national territory.¹

Trujillo's Dominicanization Policies

Haitian influence spread unchecked into the San Juan Valley until the late 1930s. Haitian Creole became the lingua franca within the valley; indeed, in the town of Elias Piña there were relatively few native Spanish speakers. Older residents affirm that Elias Piña had become, in effect, a Haitian village.

¹Francois Duvalier, Oeuvres essentielles: éléments d'une doctrine, 2 vols. (Port-au-Prince: Presse Nationale, 1968), 1:460.

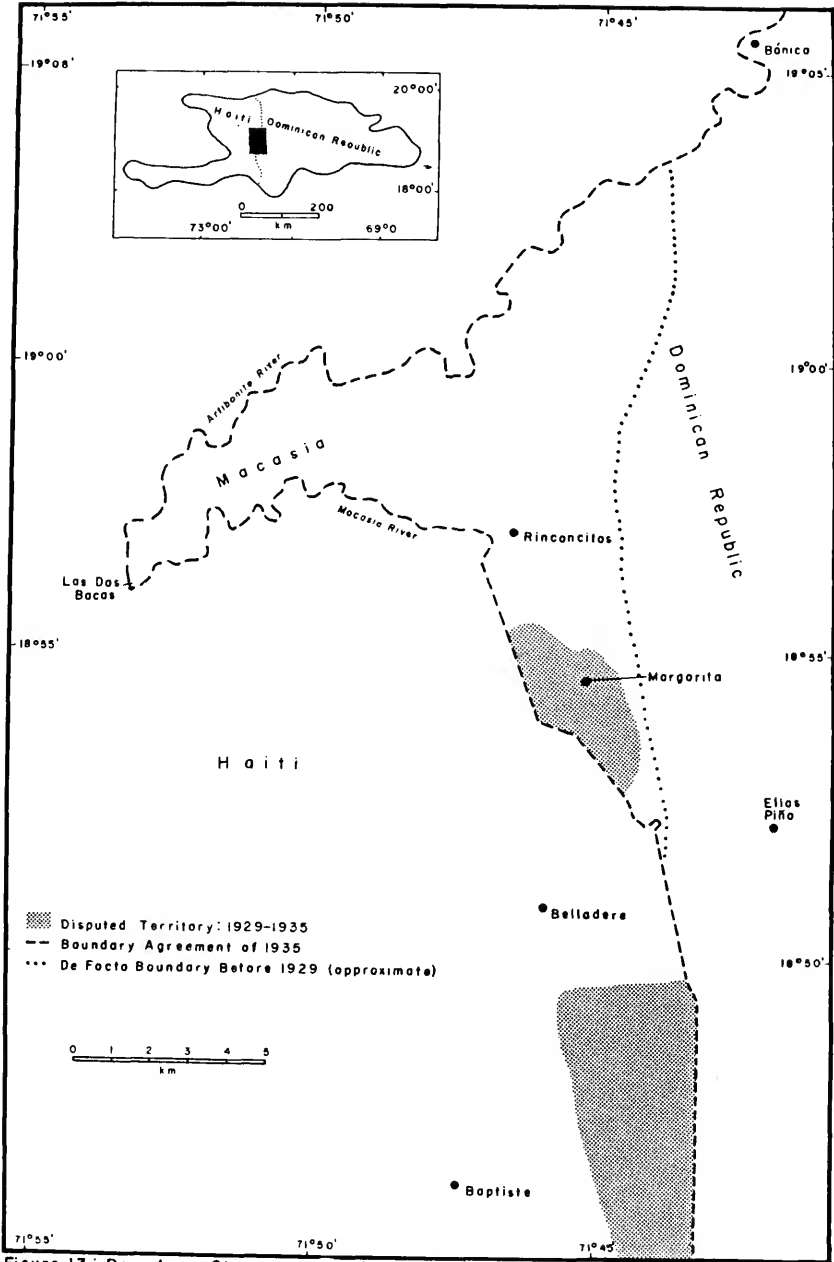


Figure 13: Boundary Changes And Disputed Territory: 1929-1935

With the spread of Haitian settlement, concern grew among Dominican leaders. In 1900, Hostos proposed that the government erect a living wall of colonists along the frontier to prevent further Haitian incursions.² The Dominican Congress passed a law in 1907 allocating funds to encourage white colonization along the frontier.³ In 1925, the Dominican government created a commission to select sites for agricultural colonies; in its report the commission wrote the following: "The purpose of populating the frontier is found in the necessity of containing the steady advance of the Haitian population into our own territory."⁴

In an effort to counteract Haitian influence along the frontier, the Trujillo government elicited the aid of the Catholic Church. In 1936 the Society of Jesus cooperated in the founding of the Misión Fronteriza, a program which sponsored numerous chapels and elementary schools in the border region and was aimed at spreading Christianity and Dominican culture.⁵ Regardless of the program's success, the number of Haitians in Dominican territory continued to increase.

A second attempt by Trujillo at stopping Haitian incursions into the Republic took the form of a ruthless

²Manuel A. Machado Báez, La dominicanización fronteriza (Ciudad Trujillo: Empresora Dominicana, 1955), p. 230.

³Ibid.

⁴Ibid., p. 231.

⁵Antonio L. de Santa Ana, Misión fronteriza (Dajabon, Dominican Republic: By the Author, 1957), p. 21.

purge. Without warning, in October of 1937, Dominican military forces killed an estimated 10,000 to 20,000 Haitians illegally residing within the Dominican borders.⁶ Many thousands of Haitians fled back into Haiti. In October, 1937, the border was closed.⁷

The massacre of 1937 was only one phase of a six-year effort to expel the Haitians from the Dominican borderlands. Officially the program called for the Dominican government to deport the illegal aliens only after paying an indemnity for improvements the Haitians had made on their lands. It is impossible to know how frequently Dominican officials followed this procedure. Between 1937 and 1944, however, many thousands of Haitians crossed the border into Haiti. After having been ignored for 300 years, the border became a barrier to further migration.

⁶Robert Crassweller, Trujillo, Life and Times of a Caribbean Dictator (New York: The MacMillan Company, 1966), pp. 149-164.

The following explanation for the massacre was given by an elderly Dominican of mixed Dominican and Haitian parentage: "Trujillo made a horseback tour of the frontier, and when he saw that the Haitians were doing better than the Dominicans (cuando el vió que los Haitianos eran más caballeros que los Dominicanos) he decided to get rid of them."

⁷Local accounts of the expulsion of the Haitians vary, apparently according to whether or not the informant was involved. Some contend that it was entirely peaceful and orderly; others say that it was a bloodbath. The Dominican government paid an indemnity of \$750,000 to Haiti for damages. With this money the Haitian government founded three agricultural colonies designed to prevent further migrations into the Dominican Republic. They soon failed.

The expulsion of the Haitians and the closing of the border had both immediate and long-range effects in Elias Piña and Belladere. The immediate effects felt by Dominicans were that many lost herds which had been allowed to range in Haitian territory. In addition, with inexpensive Haitian products no longer available, the Dominicans' buying power was reduced by about 50 percent. The loss of Haitian laborers, furthermore, seriously hurt the agricultural economy of Elias Piña. Where Dominican farmers had begun to specialize in sugar cane growing to the neglect of food crops, loss of the Haitian farmers resulted in food shortages. Of greater economic importance, the displacement of the Haitians and the closing of the border ended legal over-land trade and reduced cattle exports to Haiti to a small amount of contraband. On the other hand, expulsion of the Haitians made available a great deal of land to the Dominican farmers.

In Belladere, an immediate result of the massacre was a massive influx of new settlers seeking vacant land. Some refugees merely returned to family lands that they left twenty years before when they fled from outlaw bands, known as cacos, into the Dominican Republic. Other refugees, Dominican by birth but Haitian by descent, were strangers in Haiti. Within a short time following the massacre, most remaining agricultural land in Belladere was occupied. The sudden increase in population prompted radical changes in farming by shortening the fallow period and transforming

agriculture in the more fertile areas from a slash-and-burn system to continual cultivation. This more intensive use of the land led to accelerated deforestation and soil erosion.

The massacre of 1937 had long-lasting effects on relations between the Dominicans and Haitians. Before 1937, inhabitants of the frontier region generally had ignored the boundary line. Family unions between Haitians and Dominicans were common; both lived in the same communities. Communal work groups, combites, often consisted of neighbors from both sides of the border.⁸ This interchange ended in 1937 when the Dominican government outlawed all types of cross-border contacts.

In an effort to erase Haitian influence, the Dominican government outlawed the speaking of Creole and discouraged the construction of Haitian-style houses. School attendance became mandatory and Dominican history and civics were stressed. To add legal sanction against further Haitian immigration, a law of 1938 placed a \$500 head tax on all non-Caucasian immigrants settling in the Dominican Republic. In place of the tolerance which had developed from close contact between the two peoples, a sense of mistrust developed in subsequent generations of Dominicans who derived

⁸The following comment is from a Dominican farmer near Las Dos Bocas: "Before 1937 everyone lived as one people. Then after the border was closed we lost a lot of animals and now if an animal strays across the border or is stolen by a Haitian we can't even go looking for it. For that reason I think it was better before they closed the border."

their knowledge of the neighboring country solely through hearsay and polemical textbooks.

In 1942, Trujillo institutionalized frontier development under a broad-sweeping "dominicanization" plan. Under this plan, the Dominican government modernized the town of Elias Piña by construction of public buildings, a hospital and schools, and by provision of a complete array of public utilities. In an effort to bring Dominican culture to the frontier, the government commissioned music teachers and sponsored a town band. A fortress-like building, the "Trujillo mansion," was constructed for use on the president's rare visits to Elias Piña (Figure 14).

Estimé and Development of the Haitian Frontier

In November, 1943, the Haitian President, Lescot, accused Trujillo of threatening the peace through the Dominicanization plan. In answer to this accusation, Trujillo defended his policies and challenged the Haitian government to develop its frontier as well.⁹ The Haitian

⁹In his public answer to Lescot, Trujillo hinted that the Haitian president had been involved in the massacre of 1937. "That work [the nationalization program] involves no danger for Haiti; on the contrary it will help to avoid future incidents which could create problems like those which you and I helped to solve, in a satisfactory manner, in 1937.... So peaceful and full of noble Christian aspirations is the Dominicanization of the frontier that I say to you, my dear President Lescot, that I would be very happy if you would undertake along the Haitian frontier a labor of equal vigor, with the same peaceful and civilized purpose." (La frontera de la República Dominicana con Haití [Ciudad Trujillo: Editorial la Nación, 1946], p. 134.)



Figure 14: Trujillo Mansion in Elias Piña

President, Estimé (1945-1950), accepted the challenge and sponsored a program of border development clearly modeled after the Dominican example.¹⁰ Estimé's strategy called for the development of towns along the entire length of the border, construction of connecting roads, and provision of government aid for agriculture.

The construction of Belladere Town became the primary and somewhat quixotic work of the Estimé regime. In explaining the purpose of his project, Estimé wrote the following: "We not only expect to make of Belladere a frontier-type town, but we also expect to make it a model rural community which can be multiplied throughout Haiti."¹¹ A further motive was that of discouraging rural-urban migrations: "In constructing towns such as Belladere in the interior of the country and close to agricultural colonies, I hope that the farmers will be persuaded to stay on their lands."¹² Unfortunately, Estimé's foresight was not shared by his successors.

The town of Belladere was designed to be the commercial hub of the central borderlands in Haiti. It was to serve as a stop-over on the main road between Port-au-Prince and Santo Domingo during the relatively relaxed political

¹⁰It is widely believed that the immediate impetus to develop the Haitian border came during a meeting between Presidents Trujillo and Estimé in Elias Piña and Belladere when the Haitian president was shamed by the poor appearance of the Haitian border town compared to Elias Piña.

¹¹Haiti Journal, 18 December 1946.

¹²Haiti Journal, 29 November 1948.

period of the late 1940s and early 1950s. At that time the 109-kilometer highway from Port-au-Prince to Belladere was one of the best in Haiti, requiring only three hours of driving time. The Estimé government invested large sums in constructing elaborate public buildings, paving the streets and providing all of the public utilities of a modern town.¹³ The "Club Hotel" of Belladere, built to rival the Hotel in Elias Piña, was one of the finest in Haiti at that time¹⁴ (Figure 15).

After its completion in 1948, Belladere flourished for several years as a popular weekend resort for the wealthy from Port-au-Prince. Relaxed border relations permitted the town to develop into a trade center. The general merchandise and clothing store, known as "The Bazaar," attracted Haitians from the surrounding region and Dominicans from as far east as San Juan de la Maguana. The government hotel was the center of cultural life in the region attracting guests from Port-au-Prince and wealthy Dominicans from the San Juan Valley. Belladere vied with Elias Piña as a model border town. In 1950, after meetings

¹³Officially, the costs were between two and four million dollars, all but \$600,000 coming from "donations" by wealthy Haitian businessmen. (Haiti Journal, 29 October 1948.)

¹⁴The following describes the grand opening of the hotel: "... the grand ball began at 10:00 P.M. with the palace orchestra and with jazz for the young people. This great event will go down in the annals of a nation as a complete success." (Haiti Journal, 3 November 1948.)



Figure 15: Club Hotel in Belladere

between Presidents Magloire and Trujillo in the two towns, Trujillo reportedly was so chagrined at the inferiority of construction at Elias Pinã that he ordered all wattle-and-daub buildings near the center of town replaced with modern stucco houses.

Along with developing Belladere Town as a marketing and commercial center, the Haitian government established an agricultural colony in the southern mountain zone. The colony of Baptiste was located nineteen kilometers southeast of Belladere Town at an elevation of 1,080 meters above sea level. This mountain region had been gradually settled during the nineteenth century and, by the early 1900s, was relatively prosperous with its economy based on subsistence farming and small-scale coffee production. The Estimé government chose this site for development in 1946 because, as the center of rapid in-migration from the lowlands, it was experiencing accelerating deforestation and erosion problems. Government planners hoped that long-range technical assistance could alleviate these problems and that the region would become an important coffee-producing zone.

Baptiste colony consisted of a small, neatly-arranged village, with well-built public buildings, a limited number of private homes for colonists and a central plaza. A thirty-eight-hectare state-owned coffee orchard served as a demonstration project in which individual colonists were assigned farm plots for cultivation under supervision of government agronomists. In addition, the government dis-

tributed five-hectare plots of coffee land to the colonists and constructed an all-weather road from Baptiste to Belladere to facilitate marketing. The advantages offered by the colony attracted settlers from throughout the borderlands, particularly from the eroded lowlands to the north of Belladere Town and from the arid zones of Mal Passe and Grand Bois to the south.

The end of the Estimé region in 1950 signaled the beginning of decline for Belladere and Baptiste. Magloire, Estimé's immediate successor, continued to support minimal government facilities, but he invested no additional revenues for services and improvements. The Duvalier government, which came to power in 1957, had other priorities entirely and relegated Belladere and Baptiste to their former status within an isolated agricultural zone. By 1960, the roads were impassable in bad weather, the hotel in Belladere was closed, and public buildings were beginning to deteriorate.

Settlement and Population

Although no reliable census data exist for either Elias Piña or Belladere before 1950, sequential land-use maps indicate population and settlement changes which occurred during the 1900-1961 periods (Figures 16 and 17).¹⁵

¹⁵The map legend used in Figures 16, 17 and 23 is based on the land use-land cover classification system in Appendix 4. When a specific land-use category found in the legend does not appear on one of the maps it is because such land use did not exist in the region at that particular time.

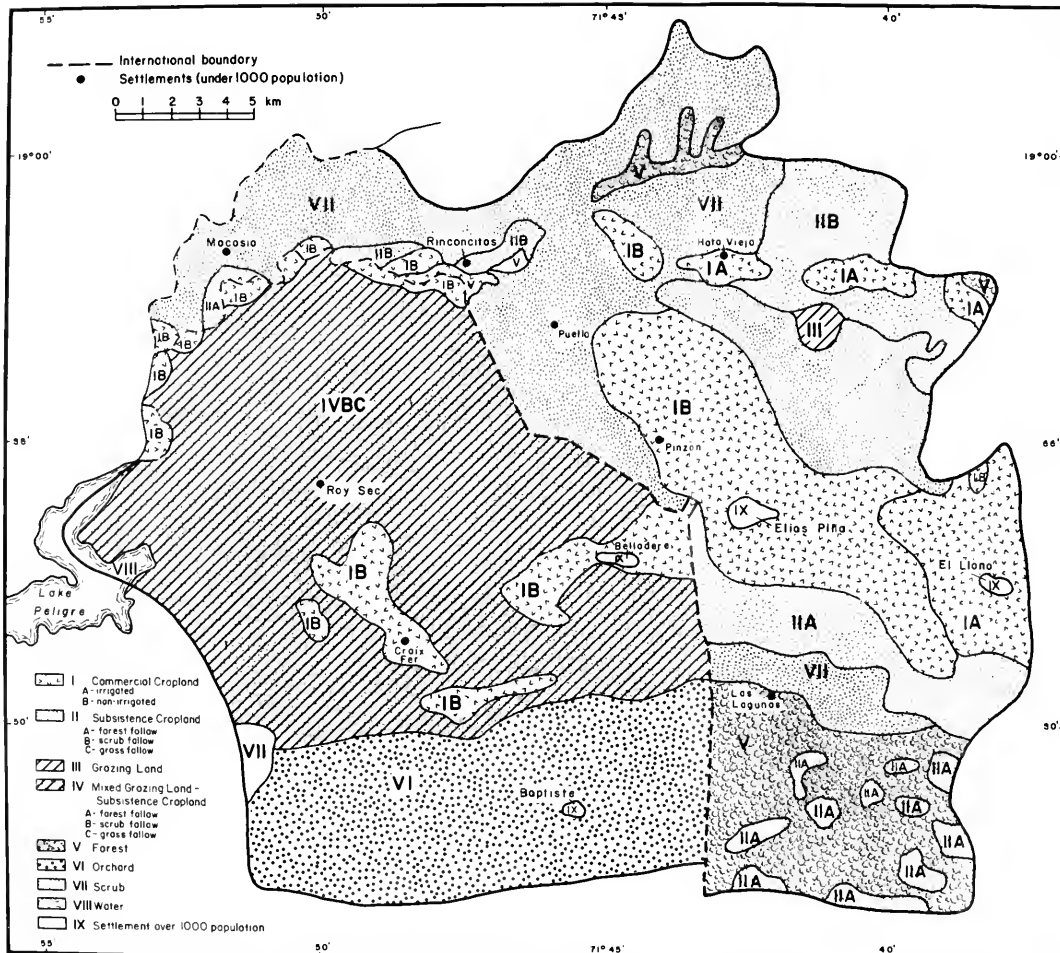


Figure 17: Land Use-Land Cover, Elias Piña-Belladere: 1958

An increase in the "Commercial Cropland" map category in both Elias Piña and Belladere implies an increase in population. As explained in the land-use classification system "Commercial Cropland" is invariably in continuous production. Very often this reflects not only a shift from subsistence to commercial crops, but it also indicates increasing population pressure on the land which has forced the farmers to use their land on a continual basis. The increase in the "Subsistence Agriculture" map category in the mountain zone of Elias Piña is an indication of increasing population density on the valley floor which forced farmers to seek vacant mountain land, particularly for food crops.

The takeover of forest land by agriculture in the southern mountain zone is indicative of a large-scale lowland-to-upland migration in Belladere, but not in Elias Piña. In Belladere, as lowland soil conditions worsened, farmers acquired land in the mountains and relocated their farmsteads and families. The Baptiste area was a focus of in-migration from the less fertile lowlands during the first half of the present century. The population of the mountain zone peaked between the late 1940s and early 1950s and then remained stable, the natural increase being offset by migrations into the Dominican Republic. In the mountain zone of Elias Piña, on the other hand, most of the land brought under cultivation between 1900 and 1961 was owned by valley farmers or by farmers from Hondo Valle to the south. Many of these ab-

sentee owners had planted all of their valley lands in peanuts and acquired mountain land for food crops.

The change from the category "Mixed Grazing Land--Cropland" to "Scrub Land" in the northern portion of Elias Piña (Figure 17) reflects the loss of the Haitian alien population in the late 1930s and early 1940s. The influx of these displaced Haitians into Belladere was responsible, in part, for the increase in commercial cropland or continuously-cropped land near the towns of Belladere and Croix Fer.

The only portion of Elias Piña which did not increase significantly in population between 1900 and 1961 was Macasia, the finger-like westward land extension between the Macasia and Artibonite Rivers. Macasia was Haitian territory until 1935 and remained settled by Haitians until the massacre of 1937; since that time it has been sparsely populated. Evidences of its past settlement history are the Haitian cemetery with gravestones dating from the mid-nineteenth century and the neatly-spaced mango orchards, a frequent indicator of former Haitian occupance.

The Dominican and Haitian population censuses for 1950 give a total population of 12,530 for the municipality of Elias Piña (density 35.2/sq. km.), and 19,797 for the commune of Belladere (density 65.9sq. km.). The 1960 Dominican Population Census shows a population increase for Elias Piña of 59 percent for a total of 19,970 (density 56.1/sq. km.). No comparable 1960 data are available for

Belladere but 1964 figures from the Malaria Eradication Service show a total population of 20,016 (density 66.6/sq. km.) for an increase of less than 1 percent since 1950. The population increase in Elias Piña is undoubtedly a reflection of the success of Trujillo's Dominicanization Plan. On the other hand, abandonment of the Estimé frontier developing scheme was an important factor influencing the almost static population growth of Belladere.

Changing Land Use: 1900-1961

Along with changing settlement patterns, marked changes occurred in the use of the land. Land-use practices which had remained largely unchanged for three hundred years were altered entirely during the 1900-1961 period.

From Cattle Raising to Farming

During the first two decades of the present century the livestock trade continued on both sides of the border much the same as in the late nineteenth century. Cattle, mules, donkeys, and horses (as well as fighting cocks) were major exports from the still sparsely settled San Juan Valley to Haiti. The most frequent destination of the cattle drives was the livestock-market town of Croix de Bouquet, seven days from Elias Piña and only about ten kilometers from Port-au-Prince. The usual modus operandi of the cattle herders was to sell the animals in Croix de Bouquet, exchange the Haitian currency for gold in Port-

au-Prince, and then resell the gold in the Dominican Republic for a profit.

The first impediment to the overland cattle trade was the establishment of customs houses at Elias Piña and other border towns in 1924, during the United States Marine occupation. The final blow to the cattle trade, however, was the closing of the border in 1937. In order to avoid export duties, many Dominican cattlemen had moved their herds to the Haitian side of the border. The loss of these herds and the termination of legal trade marked the end of the cattle trade as it had existed since the colonial era.

Regardless of export tariffs and the border closing, cattle raising in the study region faced an inevitable decline owing to the rapid spread of subsistence farming during the early decades of the present century. By the year 1900, most subsistence farming on the Dominican side had been limited to the mountainous regions bordering the valley; the valley floor was the undisputed reserve of the cattle ranches. By the 1920s and 1930s, however, subsistence plots were spreading throughout the most fertile parts of Elias Piña. The Central Plain was firmly settled by the Haitians although it was still considered by the Dominicans to be illegally occupied. The plain continued to witness an increase in subsistence farming which had begun in the early years of the nineteenth century.

Haitians and Dominicans practiced subsistence farming in an identical manner during the first three decades of the century clearing land by slash-and-burn methods, then planting with a dibble stick. Although plowing with oxen was introduced as early as 1912 in Elias Piña, it was the exception rather than the rule until the 1930s. On both sides of the border farmers planted a wide variety of food crops. The preferred staple in both Elias Piña and Belladere was upland rice and beans. Other frequently planted food crops were manioc, corn, yams, squash, several types of peas, and sweet potatoes.

Early Cash Crops

Three cash crops, cotton, sugar cane, and tobacco, were grown in both Elias Piña and Belladere for sale in Haitian markets. Perennial cotton enjoyed a short period of very high demand during the late 1920s and early 1930s before it was destroyed by the boll weevil. Both sides of the study region contained numerous small animal-powered sugar mills for the production of crude brown sugar. Sugar products were in demand in Haiti, not only for household use, but for the distilling of clerin, a common Haitian alcoholic beverage. It has been estimated that in the area between Las Matas and El Llano there were over 200 of these sugar mills in operation during the 1920s. They became extremely rare in Elias Piña after the 1940s when Trujillo, in effect, taxed them out of business in order to increase

the sales of refined white sugar. On the Haitian side, however, the traditional sugar mills continued to operate (Figure 18). Along with cotton and sugar cane, tobacco was grown in the region and marketed in Haiti. On market days, towns as far east as San Juan de la Maguana were crowded with Haitian merchants buying the three above-mentioned products and selling such items as cooking ware and clothing. The commercial pattern of agricultural products in exchange for manufactured goods had changed relatively little since the colonial period. The continued commercial orientation of the Dominican borderlands to Port-au-Prince was one factor which led to Trujillo's frontier development program.¹⁶

Agricultural Land Use Under Trujillo

To increase agricultural production and encourage permanent settlement the Trujillo government established an extensive network of irrigation canals and a total of fourteen agricultural colonies on the frontier between 1938 and 1945. El Llano, founded in 1938, was the only colony in Elias Piña municipality and had 2,500 hectares of irrigated land (Figure 19). It quickly became the most progressive agricultural area in the region. Farmers from within the study region as well as from the Cibao Valley were en-

¹⁶In the early 1900s, for example, Bánica did not have a general merchandise store. Items of daily use such as matches, kerosene and soap were purchased in Haitian markets.



Figure 18: Animal-powered Sugar Mill in Belladere

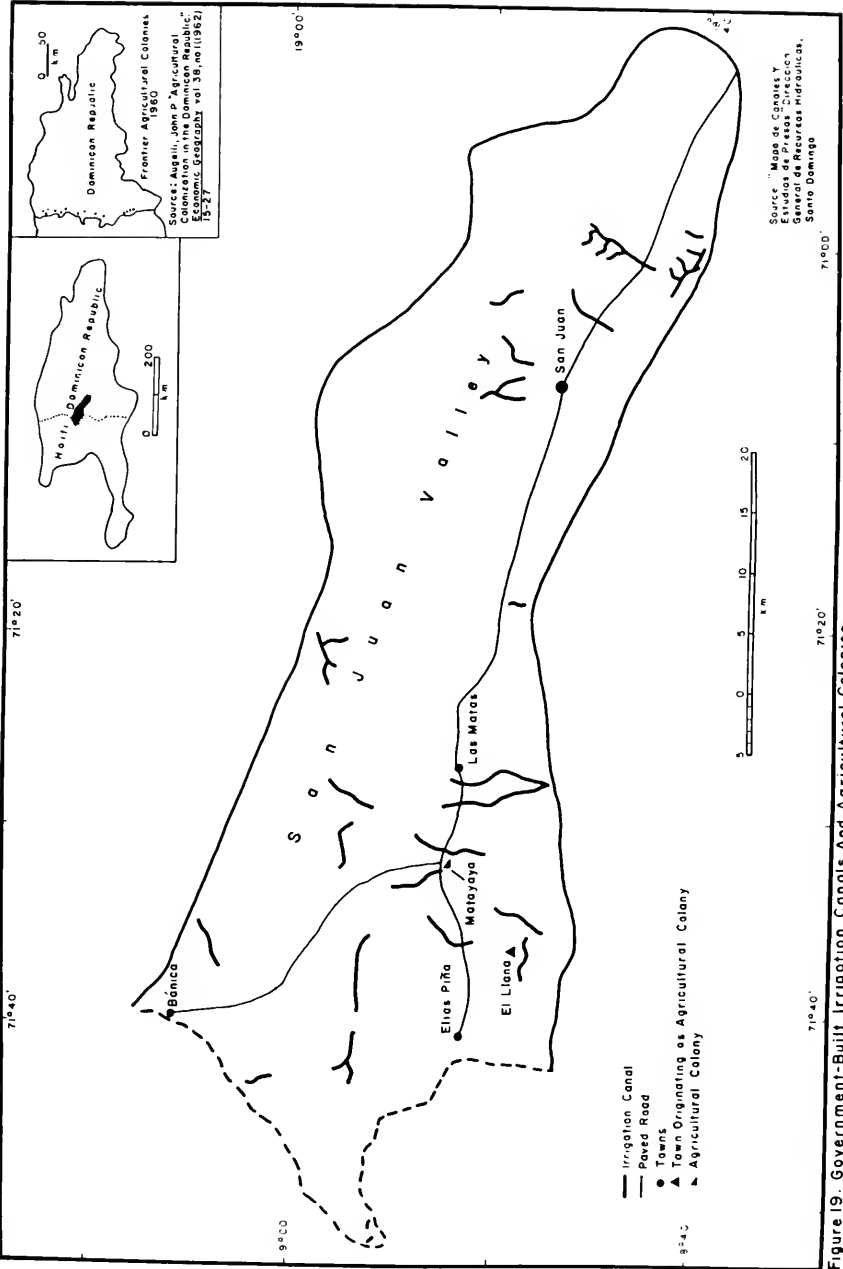


Figure 19. Government-Built Irrigation Canals And Agricultural Colonies

listed as colonists and were provided technical and material assistance. Irrigated rice became the principal money crop.

Land in the colony of El Llano remained state-owned, but the colonists had usufruct and the right to all profits. The colony was fenced off from the surrounding land and free grazing was prohibited. In accordance with the law, after ten years the colonists petitioned for private ownership and the settlement was changed from "colony" status to "agricultural zone" status. As an agricultural zone the settlement no longer received government subsidies, but the prohibition on free grazing remained in force. During the 1940s and 1950s several additional regions were designated as agricultural zones and by 1961 all of the better agricultural land in the municipality was included in this category. In effect, the open range was gradually outlawed throughout the municipality. A comparison of land-use maps for 1900 and 1958 shows the effects of ending the open range (Figures 16 and 17). Whereas in the year 1900 cattle were allowed to graze on all unfenced land, by 1958 the situation was reversed. The requirement that all animals be either fenced or tied, in effect, destroyed most of what remained of the cattle industry in Elias Piña because very few fenced properties contained adequate water sources for maintaining animals.

In Elias Piña during the 1930s and 1940s agriculture began to shift away from subsistence farming to a commercial,

market orientation. In addition to providing subsidies to the colony of El Llano, the government provided material assistance such as oxen and plows to individual farmers. In most areas these were the first plows ever seen. Technical aid was made available on a limited scale through agricultural extension offices.

In order to further ensure agricultural productivity, the Trujillo government strictly enforced the vagrancy laws. Any rural, adult male without a minimum of ten tareas (.62 hectare) in cultivation was subject to arrest and a sentence of forced labor in an agricultural penal colony.¹⁷

To facilitate the marketing of agricultural products the Trujillo government built feeder roads connecting the theretofore isolated agricultural communities with the principal highways. In addition, roads were constructed connecting Elias Piña with the newly-completed international highway to the north of the study region and to the south with the southern border town of La Descubierta (Figure 20).

¹⁷Article 271 of the Código Penal, modified by the Law 623 of June 3, 1944, states that any farmer not cultivating a minimum of ten tareas (.62 hectares) will be sentenced to jail for between three and six months for the first offense, and up to two years for the second offense, or they might be sent to an agricultural penal colony. (Hector Baron Goico, Manual de derecho agrario, obra didáctica [Ciudad Trujillo: Editora del Caribe, 1960], p. 179.)

From Subsistence to Commercial Farming in Elias Piña

An equally important stimulus to agricultural development was the establishment in the early 1930s of La Sociedad Industrial Dominicana. Known as the Manicera, this nationwide peanut-processing firm contracted Dominican farmers to grow peanuts and sell only to the Company. The Manicera provided such services as plowing the land, providing seed and financing. The cost of these services was deducted from gross profits after the harvest.

The Manicera, even more than Trujillo's Dominicanization Plan, was responsible for bringing mechanized farming to the Dominican frontier. Farmers who had been able to cultivate a maximum of one hectare by traditional hand methods found that with modern tractor plowing they could cultivate many times that amount. Bringing the additional land into cultivation made it unavailable for rental or for sharecropping by the landless. Those farmers who owned no land but had always rented or simply "borrowed" a sufficient amount for subsistence, suddenly found land very scarce.

A much higher percentage of the arable land came under cultivation, and the fallow period, on which traditional farming depended for soil rejuvenation, was abruptly shortened. A comparison of the land-use maps for the years 1900 and 1958 shows the increase in land under commercial agricultural production; this represents land with little or no fallow (Figures 16 and 17).

The Manicera had the profound effect of changing the farming economy of Elias Piña from a subsistence to a market orientation. Farmers took most lands out of food-crop production and planted them in peanuts. Very quickly peanuts became the dominant crop in non-irrigated land. No other crop offered the combined advantage of a short growing season (three months), a guaranteed market, mechanized land preparation, and financing for the entire cycle from plowing to harvest. Beginning with the establishment of the Manicera in Elias Piña, agriculture in the Dominican borderlands developed along entirely different lines from that of the continuing subsistence system of the Haitians.

Land-Use Change in Belladere

During the 1930s and 1940s, the period of modernization of agriculture in the San Juan Valley, to the west in Haiti the lowland region of Belladere continued to suffer extreme soil erosion and declining agricultural productivity. Land which had been planted only in upland rice as late as the 1920s was, by the 1930s, planted either in sorghum (a more reliable crop for low-fertility soils) or in a mixture of subsistence crops. In some instances, these same fields could support only sisal by the 1950s and 1960s.

In contrast to the market-oriented farm system in Elias Piña, agriculture in the lowlands of Belladere remained on a subsistence level and became increasingly dependent on a wide mixture of interplanted food crops. By mid-century

the principal staple in the Haitian diet had changed from rice to sorghum. The trend was toward the low nutritive-demanding root crops such as manioc, yams, and sweet potatoes.

Concomitant with soil erosion and declining agricultural productivity, increasing population pressure and continuing fragmentation of land holdings made lowland farming in Belladere even more untenable. A definite extension of subsistence farming into the highlands had begun by the 1930s. By the mid-1940s this mountain zone was the most densely-cultivated portion of the commune. With the founding of Baptiste Colony, a great deal of land was converted from food crops to the growing of coffee. Despite the emphasis on coffee, however, most Haitian farmers continued to plant a variety of subsistence food crops. As a result, the Haitian mountain zone never became as tied to the money economy as did the peanut and rice growing regions of Elias Piña.

Open grazing continued to be practiced in Belladere until the mid-1960s in marked contrast to the carefully regulated grazing in Elias Piña. Before the fencing of the open range, the only places in Belladere without free grazing were the productive farm lands near the towns of Belladere and Croix Fer and the forested mountains to the south.

Changes in the Physical Landscape: 1900-1961

Changes in settlement and land use had pronounced effects on vegetation during the 1900 to 1961 period. In the early years of the century forests covered not only the mountain zone, but the alluvial region of the valley floor and the river floodplains as well. The highland forests consisted primarily of pines with a variety of intermixed hardwoods. Lowland forest cover varied according to topography and edaphic conditions (see Chapter II). As a general rule, the alluvial zones were forest-covered and the hilly, rocky areas were covered with grasses. The formerly-forested portions of the lowlands became the most productive agricultural lands. An exception to this was the fertile plain of El Llano which was an uninterrupted grassland at the turn of the century.

In the early 1900s, there was very little scrub on either side of the border. However, with continual grazing followed by repeated cultivation, the grasslands evolved into scrub growth. By the 1920s, mesquite, brought west by cattle drives early in the century, had become the dominant thorn scrub in these cut-over areas along both sides of the border. Mesquite has remained the most common scrub in Elias Piña, but on the Haitian side it has been almost eliminated as a result of charcoal making. In this process, mesquite is continually cut back allowing the grasses to dominate. This interruption of the normal ecologic succession

explains the much greater extent of grasslands in Belladere than in Elias Piña.

Unquestionably the principal cause of deforestation between 1900 and 1961 was the clearing of the land for cultivation (Figures 16 and 17). With population growth more land has come under cultivation, the fallow period has been shortened, and after repeated clearings the forest has lost its regenerative capacity. Charcoal making also has been responsible for widespread deforestation, particularly in Haiti where even the wealthy families of Port-au-Prince depend on charcoal for cooking fuel (Figure 21). As the best charcoal-producing hardwoods were eliminated, other less suitable types were used. Until the gradual end of the open range in Elias Piña from the 1930s to the 1950s and the outlawing of free grazing in Haiti in the 1960s, the cutting of wood for fencing was also a major cause of deforestation.

Commercial timbering has played a role in deforestation although to a less extent in the study region than in many parts of the island. There is no record of saw mills operating in Belladere; as recently as the 1940s, however, timber was cut, tied into rafts, and floated down the Artibonite River to a point where it could be transferred to trucks bound for Port-au-Prince.

Limited forest zones were destroyed for construction purposes. Mata Bonita, a small pine forest stand located on the valley floor east of the town of Elias Piña, was deforested during a road and bridge building program of the



Figure 21: Charcoal Making near Belladere

1930s. The construction of Belladere Village in the late 1940s reportedly was responsible for considerable deforestation near that site.

The building of Lake Peligre in 1950 on the northwest side of Belladere commune also led to considerable deforestation. The lake submerged one of the most densely-settled regions of east-central Haiti, and the displaced population resettled in the nearby hills clearing tracts of land for the planting of sugar cane and other crops.

Valuable hardwood trees such as mahogany have traditionally filled the role of "bank" for both Haitian and Dominican farmers. In times of emergency a tree could be sold and the bills paid. This custom was interrupted in Elias Piña in 1966 with the anti-deforestation laws of the Balaguer government. In Belladere, however, such tree cutting was unrestricted; and, as there was virtually no replanting, it gradually eliminated most of the hardwood forests.

Soil erosion and declining soil fertility during the 1900-1961 period are reflected on the landscape and by the constantly lower agricultural yields reported by farmers throughout the region. Principal causes for deteriorating soil conditions have been deforestation and increasingly intensive use of the land without a return of soil nutrients. Soil rejuvenation by means of a long fallow period became decreasingly effective as a growing population density reduced the length of the fallow. The use of fertilizers,

which could compensate for the decreasing fallow, was unknown until the 1930s in Elias Piña and until the late 1940s in Belladere; it has never been well accepted except by a small minority of progressive rice and coffee growers, and rising costs appear to be reducing its availability.

A good indicator of declining soil fertility is the change in types of crops grown in the nonirrigated areas. In many portions of Elias Piña and Belladere, it was reported that upland rice, a high nutrient user and formerly the principal food crop, can no longer be grown.

The introduction of the plow in Elias Piña, and particularly the widespread acceptance of tractor plowing beginning in the 1930s, was a major cause of soil erosion. Plowing removed the stumps and debris which, under the traditional system of land clearing by hand tools, had served to hold the soil. With little care given to contouring, tractor plowing has led to extensive erosion in some areas. There is general agreement among farmers in Elias Piña that soil erosion became a problem only with the introduction of machine plowing and that as larger machinery was used the problems grew worse.

Government Policies as Key Landscape Determinants

The following government policies were important determinants of landscape change from 1900 to 1961: (1) frontier development programs of Trujillo and Estimé,

(2) border restrictions, (3) control of migration, (4) laws ending the open range, and (5) the regulation of land clearing and deforestation.

The role of direct government policy in influencing landscape change was most evident in Elias Piña owing to the thirty years of continuity during the absolute rule of Trujillo. Belladere, on the other hand, was the focus of government concern for only a brief period and underwent relatively little long-term, directed change.

The success of Trujillo's border development policies was primarily attributable to continued government support. The irrigation systems, road network, new agricultural technology, and the opportunity to participate in the money economy through the Manicera were all innovations so well established during the regime of Trujillo that their continuation after his demise was assured.

The short-lived development of Belladere, on the other hand, was a classic example of lack of continuity in policy. The plan was modeled after the highly successful Trujillo program and might have had a long-term impact, but presidents succeeding Estimé had other development priorities and increasingly neglected the frontier region. The development of Belladere had been too much the project of a single individual. It never had the full backing of other factions of government which might have carried such a project through after the end of the Estimé regime. A few farmers continued to use the new techniques learned from

government extension agents but, in general, this Haitian development scheme left little imprint.

It should be noted that the Dominican policy of tightening border restrictions, particularly since the late 1950s, had certain negative effects on both Elias Piña and Belladere. When the border was open, movement and commerce between the two border towns had a salutary effect not only economically but psychologically as well. With the closing of the border, both towns were suddenly "at the end of the road." The isolation and end of cross-border commerce had a negative impact on the economy of both sides and, for many Dominicans and Haitians alike, made the border region a less attractive place to settle.

The success of Trujillo's efforts to populate the border region was attributable, in part, to his policy of strict control of internal migration. Inhabitants of Elias Piña and other rural regions were not permitted to move except under extenuating circumstances. The lack of out-migration helped explain the rapid population increase in Elias Piña from 1950 to 1960 (Appendix 5). The effectiveness of the Trujillo migration policy became evident when, after the dictator's death, large-scale rural-to-urban migrations became a major national problem.

The Dominican policy of gradually fencing the open range throughout Elias Piña entirely changed the character of land use in the region. The success of this policy in encouraging agriculture was attributable to the fact that it

met a definite, perceived need on the part of the small farmers who needed protection from freely-grazing animals. The laws came into effect when wood for fencing was becoming scarce and when free grazing was becoming increasingly prejudicial. Because the new laws filled a need, the people themselves enforced them. Other regulations, particularly restrictions against tree cutting, had little effect primarily because they did not meet such a perceived need.

CHAPTER VI
CONTEMPORARY POPULATION AND SETTLEMENT: 1962-1974

The assassination of the dictator Trujillo in 1961 ended a thirty-one year period of stringent government control over many aspects of Dominican life. In Elias Piña, as in other rural areas, agents of the Trujillo government had strictly monitored the activities of the people, guarding against anti-government propaganda, and enforcing such laws as those concerning vagrancy and deforestation.¹ "Line Chiefs" in each frontier municipality had accompanied military patrols on boundary inspections to prevent contraband and illegal crossings from the Haitian side. With the fall of Trujillo, however, these and similar controls vanished and a five-year period of relaxed political policy ensued.

From 1961 to 1966 large numbers of Haitians illegally entered Elias Piña in search of vacant farm lands. Reminiscent of events in the late nineteenth century, the

¹Under the Trujillo regime, it was illegal to cut trees on mountain tops, within thirty meters of rivers, within 150 meters of springs which served for drinking water, and within twenty meters of lakes and ponds. (Dominican Republic, Ley sobre conservación forestal y árboles frutales, no. 6787, April 28, 1945.) (Baron Goico, Manual de derecho agrario, obra didáctica.)

Dominican government was too preoccupied with political turmoil in Santo Domingo City to control the clandestine borderland migrations. There was also a noticeable increase in contraband during this five-year period.² The sudden relaxation of restrictions against movement, the end of the vagrancy laws, and the economic instability following Trujillo's death, led to large-scale rural-to-urban migrations.

The Balaguer Development Program: 1966-1974

The incumbent government's tenure in power, dating from 1966, has been marked by new prosperity in the Dominican border region.³ Among its far-reaching policies has been a ten-year moratorium on tree cutting which went into effect in 1966 and forced the closing of saw mills operating throughout the Republic.⁴ The deforestation laws, still enforced in 1974, prohibited the burning of fields except under special circumstances and even outlawed the cutting of individual trees for repair or construction of houses without permission from local forestry officials.

²The increase in contraband rum from Haiti was so great that several liquor stores in Elias Piña were driven out of business.

³Dr. Balaguer was also president of the Republic for a short time during and immediately after the Trujillo period, from August 2, 1960, to December 31, 1961.

⁴From a conversation with the head of the forestry office, Elias Piña, April 23, 1974.

The Balaguer government has been especially active in constructing irrigation systems.⁵ By 1974, however, only a few small-scale projects, including extension of the Trujillo-built irrigation works and installation of several irrigation pumps on the Macasia and Artibonite Rivers, had benefited the municipality of Elias Piña. In 1974, feasibility studies were underway for diverting water to Elias Piña from the Joca River located to the north of Elias Piña and for the construction of a new reservoir in the mountains to the south of the valley.⁶

Land reform has been one of the primary stated objectives of the Balaguer government. The impact of the reform will be especially great in the eastern half of the valley where the intent is to relocate small farmers on the newly-irrigated valley floor and move the large ranches into the surrounding hills.⁷ In Elias Piña the reform will be less far-reaching due to the limited number of large holdings suitable for division. By 1974, land reform in Elias Piña had been limited to granting legal title to farmers already occupying state lands. If the proposed irrigation projects are successful, however, more land will be considered for distribution.

⁵The principal irrigation project in the San Juan Valley is the Sabaneta Dam on the San Juan River north of San Juan de la Maguana. Water from this reservoir is expected to irrigate 8,000 hectares between San Juan and Las Matas de Farfán; it does not reach Elias Piña.

⁶El Caribe, 1 April 1975.

⁷From an interview with Sr. Urbano Fermín, head of the land reform office in San Juan de la Maguana, March 15, 1974.

Expansion of the system of farm-to-market roads has been a major feature of the Balaguer government's frontier development plan. A program of bridge building and road repair was underway in 1974 along the border road connecting the town of Elias Piña with Bánica.

Transportation and Isolation

A striking contrast in the transportation network and in vehicular movement exists between Elias Piña and Belladere. Paved highways connect the town of Elias Piña with Santo Domingo, 260 kilometers to the east and a journey of only five hours by automobile. An unpaved all-weather road leads from Elias Piña to Bánica by way of several border settlements and military outposts. In addition, Elias Piña has numerous market roads, most of which are passable by truck or jeep in all but the worst weather.

By contrast, Belladere is served by only one main road, that leading from the town of Belladere to Port-au-Prince, a distance of 119 kilometers (Figure 20). An extension continues on nineteen kilometers to Baptiste. The road is paved from Port-au-Prince to the town of Mirebalais, but the remaining fifty-seven kilometers are unpaved and often impassable. It is not uncommon for the nineteen-kilometer trip from Belladere to Lascahobas to require two days by truck in the rainy season. Likewise, the mountain road from Belladere to Baptiste is often impassable.

The only other road in Belladere links the town of Croix Fer to the village of Roy Sec, a distance of five kilometers. In short, the transportation network of Belladere is roughly equivalent to that of Elias Piña before the era of Trujillo.

There is a marked difference also in the amount of vehicular traffic in Elias Piña and Belladere. Numerous public taxis provide daily service between Elias Piña and San Juan de la Maguana. Trucks from Santo Domingo and other Dominican cities make daily deliveries to merchants in Elias Piña. Tractors and trucks from the Manicera are always in evidence. Furthermore, several individuals in Elias Piña own automobiles.

By contrast, Belladere is very quiet. In dry weather, two or three trucks arrive twice a week, on Wednesdays and Saturdays, for the local market. An occasional jeep passes from Baptiste to Port-au-Prince and military or government vehicles infrequently bring officials to the town. During the coffee harvest several trucks daily pass to and from Baptiste. All other traffic in Belladere is by foot or by horseback. Passenger traffic to the Haitian capital city is limited to the market trucks on Wednesdays and Saturdays. The trip by truck from Belladere to Port-au-Prince requires a minimum of seven hours in dry weather and as much as two days during the rainy season.

With regard to the movement of people and goods, therefore, Elias Piña is much less isolated from national life than Belladere. Residents of the Dominican frontier

are in constant contact with national policies and national life by means of modern transportation, communication, and mass media. During national elections political campaigning is carried to every part of the municipality. President Balaguer has made several visits to Elias Piña as well as to nearby rural areas to inaugurate new government projects. In short, the people of Elias Piña have a sense of participation in the life of their nation which is entirely lacking in Belladere.

Most residents of Belladere have little contact with places outside the commune. Only the well-to-do and some of the market women make regular trips to Port-au-Prince. The difficulty and expense of travel, however, discourage most people from making frequent journeys to the Haitian capital city. The transistor radio is common in the town of Belladere, but much less so in the rural areas, and it provides the principal contact with the outside world.

Population Trends

The historical demographic trend which characterized 300 years of settlement, has been reversed since mid-century and Elias Piña has overtaken Belladere in population density (Figure 22 and Appendix 5). The almost static growth rate of Belladere since 1950 reflects government neglect of the region, the declining capacity of the soils to support a large population, and the isolation of the Haitian

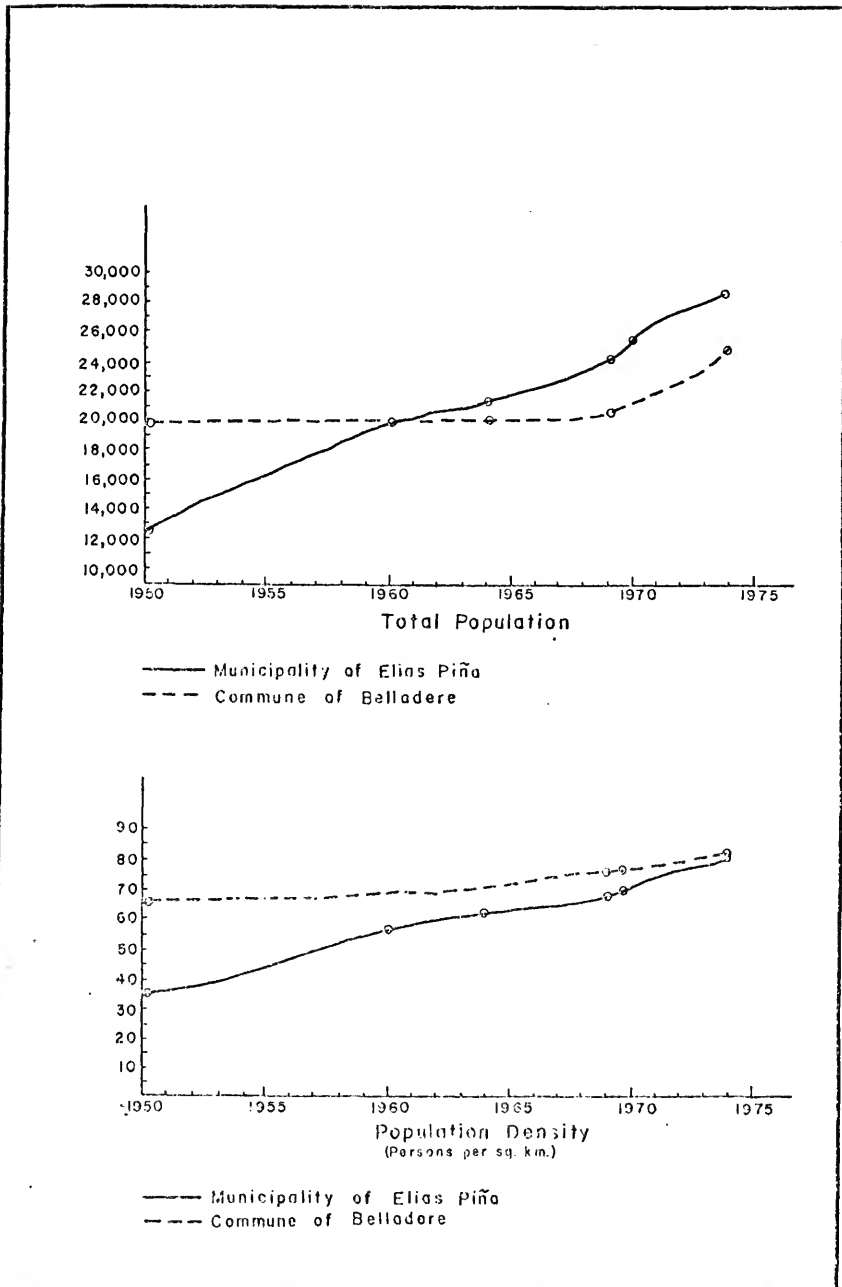


Figure 22: Population Growth and Density in Belladere and Elias Piña

frontier, all of which have led to out-migrations.⁸ Elias Piña's rapid growth, on the other hand, is attributable to a number of factors, among them the impetus of the Trujillo Dominicanization Plan, continued government investment in the region and a high birth rate.

The rapid growth of the town of Elias Piña is understandable in light of the large government investments in the town during this period. Population growth in Belladere Town, however, is somewhat surprising, considering its neglected, deteriorating state. In 1974, even the most dilapidated structures, including the bank and other large public buildings, were occupied by squatters. Some squatters have come from the rural areas to be vendors in the market or to enroll their children in school. More frequent causes for migration to the town, however, are the declining soil conditions and increasingly fragmented, rural land holdings.

The 4.8 percent annual population growth rate of Elias Piña municipality between 1950 and 1974, as compared to the 1.1 percent rate for Belladere commune during the same period, is attributable, in part, to the Dominican Republic's higher birth rate and lower infant mortality rate. In 1963, the estimated crude birth rates and infant mortality

⁸See "Soil Conditions" in Chapter V.

Although no agricultural production statistics are available to show the declining soil productivity, the universal opinion of farmers and government technicians on both sides of the border is that the decline has been very noticeable. Personal observation and examination of aerial photography taken in 1947, 1958, and 1966 support the reports of worsening soil conditions.

rates for the Dominican Republic were 45 to 50 percent and 10 percent respectively. For the same year the crude birth rate in Haiti was 43 percent and the infant mortality rate 18 percent.⁹

Most border residents clearly see the relationship between increasing population density and the fragmentation of landholdings. Few of them, however, relate this problem to the tradition of having large families. A high value is placed on children for their role as additional farm labor and as insurance for old age. Very few people on either side of the border practice any systematic form of family planning. It is a source of pride, particularly on the Dominican side, to have fathered a large number of children, often by several women. Polygamy is relatively common in both areas and although it may be frowned upon for moral or religious reasons, it is never criticized for its role in contributing to the population problem. Dominicans living along the frontier frequently cite the need to "outbreed the Haitians" as justification for having large numbers of children. The fact that the birth rate in Elias Piña is higher than that in Belladere comes as a surprise to Dominicans who are concerned with the rapidly multiplying "Haitian hoards."

⁹United Nations, Demographic Yearbook (New York: United Nations Publishing Service, 1963), 15:144. Calculation of reliable fertility rates is impossible for most periods due to the incomplete registration of births.

Settlement Patterns

The dispersed settlement pattern of Belladere and Elias Piña, examined in the preceding, historical chapters, has continued to the present time. Unlike many rural, agricultural people in Latin America who prefer to live in villages, frontier Dominicans and Haitians generally prefer to work lands adjoining their homesteads. This facet of the frontier landscape is beginning to change in and around Elias Piña where the advantages of town life are attracting many farm families away from the land.

There are only two Haitian towns of over 200 inhabitants in the study region--Belladere, with a population of about 2,000, and Baptiste, with an estimated population of 1,000. Two other villages with between 100 and 200 inhabitants are Croix Fer and Roy Sec. Other settlements noted on maps of the region are, in reality, only clusters of a few houses. Towns in Elias Piña include the town of Elias Piña itself with a population of 5,000, El Llano with about 3,000, and several villages including Rinconcitos, Macasia and Las Lagunas (built around military posts), Hato Viejo, Pinzon, and Puello with populations between 100 and 200 (Figure 23). Compared to other predominantly rural regions of the Dominican Republic, Elias Piña is notable for its scattered settlement pattern. Whereas nucleated settlements characterize the central and eastern parts of the Republic, in Elias Piña the most common pattern outside the few towns is that

of widely scattered houses. This high degree of rurality, shared by other frontier municipalities, may have resulted from Haitian influence during the nineteenth and early twentieth centuries.

The settlement pattern of Belladere is characterized by the Haitian lacour, a cluster of households belonging to members of an extended family. The lacour is always based on the paternal line, that is, young men establish their houses close to those of their fathers. In time, a cluster of households develops around the original one which belongs to the patriarch of the extended family. In recent years, however, declining soil productivity and fragmentation of land holdings have forced families to separate in order to acquire adequate farm land. By 1974, although the lacour was still a characteristic settlement unit, it was unusual to find one consisting of more than three or four households; the term lacour had come to be used to mean simply the buildings and courtyard of a farmstead even if occupied by only a single nuclear family. Settlement by extended family is not a frequent pattern in Elias Piña, and there is no equivalent for the lacour.

Internal Migrations

Migrations within Elias Piña and Belladere have declined in recent years as most lands have come under cultivation. It is still common for young, landless farmers to

seek out friends or relatives within the region who might be willing to rent or share lands. Large-scale migrations, however, such as those from lowlands to highlands in Belladere, no longer occur. The most notable internal migration of recent years has been the movement of rural Dominicans to the town of Elias Piña.

Since the death of Trujillo in 1961, city-ward migration, especially to Santo Domingo, has been one of the Dominican Republic's most pressing problems.¹⁰ For thirty-one years, the Trujillo government strictly controlled movement within the republic and attempted to keep the people on the land by improving economic conditions in the rural areas. With improved transportation and communication--especially with the spread of the transistor radio in the 1960's--came a rise in the level of expectations. The economic, cultural and educational attraction of the cities coincided with the worsening rural land shortage in Elias Piña. The result was a large-scale migration to Santo Domingo which began after Trujillo's death and has continued, though somewhat abated, to the present time. While no statistical data are available on migration from Elias Piña to Santo Domingo, it appears that the most frequent migrants are women seeking employment as

¹⁰Between 1960 and 1970 urban population (20,000 and over) increased by 5.9 percent annually while rural population increased only 1.4 percent annually. (United States Department of Health, Education and Welfare, Syncrisis, The Dynamics of Health [Washington, D.C.: United States Government Printing Office, 1974], p. 20.)

domestic servants, and young men who see the army as their escape from an unpromising future as small farmers.

Lack of adequate farmland is a common motive for migrating from Elias Piña to Santo Domingo. If a landowner dies, his heirs frequently sell their shares to one of their number and use the revenue to finance a move to the city. Unless a young man inherits enough good land to make a living as a peanut or rice farmer, he is not likely to want to remain in the region. The ideal in Elias Piña, stated time and again, is to be a successful cash cropper, not a successful subsistence farmer.

Many young men migrate from Elias Piña to the cities not because of land shortage, but because they simply do not want to be farmers. Modern communications have made them aware of other alternatives. Along with the traditional Spanish attitude of disdain for farming, the constant contact with outside opportunities has led to dissatisfaction with rural life.

In Belladere, the historical preference for rural settlement and individual land ownership is still a strong motivation for remaining on the land. Two additional factors tend to discourage migrations to the cities. First, although by any economic measure the Haitian farmer is in worse condition than his Dominican counterpart, he is much more likely to accept his fate. There are fewer outside influences which might lead to dissatisfaction. The small farmers of Belladere are obviously aware of their poverty,

but poverty is the condition of all but the very few in Haiti, and although it is not correct to say that the Haitians accept it as inevitable, there are fewer alternatives than in the Dominican Republic. The disdain for farming, so often encountered on the Dominican side, is much less in evidence in Belladere. A second factor discouraging city-ward migrations in Belladere is the limited attraction of Port-au-Prince, particularly regarding the high unemployment rate and the spiraling cost of living. While migration to Port-au-Prince has increased in the past five years and recently has become the focus of intensive study, Belladere has contributed relatively few of these migrants and most of them have been the children of more prosperous families of Belladere Village.¹¹ For prestige value, sending a child to school in Port-au-Prince is second only to sending him to the United States or Canada.

External Migrations

Emigration to North America is a common goal in both Elias Piña and Belladere. Undoubtedly this goal is more frequently realized by the Dominicans than by the Haitians owing to the expense involved and the high education or training requirements for immigration. Nevertheless, among those

¹¹Migration to Port-au-Prince is currently under study by the Haitian Center for Social Science Research (CHISS) in Port-au-Prince.

Haitians who have an awareness of the outside world, the desire to emigrate is almost universal. The two places in North America which are most commonly known to even the least-educated Haitians are "New York" and "Montreal." Frontier Dominicans, on the other hand, are most familiar with "New York."

Tighter immigration restrictions in the United States and Canada over the past several years have limited the flow of immigrants from Hispaniola.¹² Without a guaranteed job, a sponsor, or qualifications in a critical job category, the aspiring immigrant has little opportunity. The strenuous entrance requirements have given rise to a class of brokers in Santo Domingo and Port-au-Prince who specialize in processing (and often falsifying) immigration documents. It is not uncommon on the Haitian side for a relatively prosperous but naive farmer to spend his entire savings in an effort to send a son or daughter to the United States or Canada. In the unlikely event that a family member succeeds in emigrating, he is expected to send back remittances and, eventually, to help others in the family to emigrate.

It is sometimes said in Belladere that, the wealthy go to the United States or Canada, the well-to-do go to Port-au-Prince, and the poor go to the Dominican Republic. Need-

¹²In the year 1970, 21,466 Haitians and 52,700 Dominicans were legal residents of New York City. (U.S. Government, 1970 Census of Population, vol. 1, ser. PC 1-D: Detailed Characteristics, New York, Table 141.)

less to say, of the three alternatives, migration to the Dominican Republic accounts for by far the majority of migration from Belladere.

A significant migration occurred from the border area of Belladere into Elias Piña in 1963 during a military crisis between the Bosch and Duvalier governments. As the Dominican tanks and artillery drew up along the frontier, Duvalier ordered the creation of a one-kilometer no-man's-land along the boundary. Rather than relocating in Haiti, however, most of the displaced Haitians fled into the Dominican Republic and have remained there to the present day.

Migration into the Dominican Republic for employment in the sugar cane fields has been a factor in controlling the population of Belladere for several decades. Dominican sugar growers first imported Haitian cane workers in the 1870s when the Dominican sugar industry began expanding and modernizing. The flow of contract labor has continued with government sanction except for a brief suspension from 1937 to 1944, and it has increased in importance with the growth of the sugar industry itself. In 1971, the Dominican daily newspaper El Caribe reported that a total of 16,228 Haitians were employed by the seven largest Dominican sugar factories, 11,576 of them by the American-owned Central Romana.¹³

Government-sanctioned contract labor is organized in several towns in the central and southern part of Haiti, and

¹³El Caribe (Santo Domingo), 30 July 1971.

the laborers are transported by truck to the Dominican sugar fields by way of the international border crossing at Jimaní near the south coast. Few Haitians from Belladere participate in this government contract system; instead, they simply cross the border clandestinely. Those who speak fluent Spanish generally take public cars from Elias Piña to Santo Domingo or directly to the sugar factories. If their Spanish is poor, they prefer to be less conspicuous and make their way further east before taking public transportation. During the sugar cane harvest some parts of Belladere, especially the densely populated Baptiste region, lose a very noticeable percentage of their populations to the Dominican cane fields. Many of these cane workers make the trip each year; some were born on Dominican sugar estates of Haitian or mixed Haitian-Dominican parents, and speak Spanish perfectly. After the harvest many return to Belladere, but each year others either remain on the sugar estates or manage to find jobs as laborers in the cities.

The Balaguer government began intensifying its program of deporting illegal Haitian aliens in 1974, but no large-scale deportations have as yet occurred. The powerful Dominican sugar industry, which depends almost entirely on Haitian labor for the harvest, would oppose such a policy.

Haitians make up a large part of the rural labor force in Elias Piña along the border. Even as far east as El Llano, Dominican landowners sometimes use illegal Haitian labor for general farm work. Although it is illegal, the

hiring of Haitian workers is openly practiced, with an average daily wage of 50¢ (U.S.) as compared to a \$2.00 (U.S.) wage for Dominicans. Some of these Haitians have established themselves in unoccupied lands on a tenuous but somewhat permanent basis, while others cross daily to work in the fields. Well-defined foot trails cross the border at many points in the study region. Both in the mountains and along the border immediately to the north of Elias Piña, Haitian Creole and heavily-accented Spanish are very common, as are Haitian-style houses and Haitian dress. The greatest density of illegal Haitian residents is in the mountain zone where they establish subsistence farms and remain unmolested by Dominican authorities much as their ancestors found refuge from the French in the rugged terrain of the Central Plain.

Attitudes of the Dominicans toward the illegal Haitian aliens differ between the educated and uneducated classes. The more educated Dominicans fear the spread of Haitian influence, particularly superstitions related to vodun. Some are concerned that the Haitian system of non church-sanctioned marriage, the plagage, will become more widespread and with it polygamy. In fact, both polygamy and Haitian-derived superstitions are already common in Elias Piña. Certain accoutrements of vodun, especially the three traditional drums used in vodun dances, are actually more common in Elias Piña than Belladere. The Dominicans simply have more money with which to purchase such items. Polygamy is not

institutionalized as it is in Haiti, but it is considered by some to be a Haitian influence.¹⁴ The municipal government of Elias Piña has recently outlawed certain Haitian-derived carnival celebrations in an effort to discourage Haitian influence.

The less-educated Dominicans, the small farmer class, generally fear the Haitians because of their reputed supernatural powers. It is well known that the most powerful houngans or witch doctors live across the border and that the Haitians have more direct access to them. Quite often, for example, if a Dominican suddenly dies of unknown causes, it is said that "a Haitian sold him," that is, a Haitian had him transformed into another form, generally some type of animal. All in all, most Dominicans have a degree of disdain for the Haitian aliens based partly on racial prejudice and partly on the Haitians' poverty. However, the need for cheap labor is enough to prevent any serious effort to expel them.

The Border: An Ineffective Barrier

Five Dominican and two Haitian military posts, including major installations in the towns of Elias Piña and

¹⁴Haitian law recognizes only monogamy; however, under law "natural" children born of plaçage unions have definite legal status. For example, they are entitled to one-fourth of the heritable goods after the death of the father while the children of the legal wife are entitled to the remainder. (Melville J. Herskovits, Life in a Haitian Valley [New York: Doubleday and Co., 1971], p. 130.)

Belladere, face the border along its eighty-four kilometer extent within the study region. Immigration and customs officers in both border towns serve as an added control over clandestine activities. Nevertheless, the length of the border and the rugged topography make effective control impossible and there is a considerable amount of contraband movement.

Contraband between Elias Piña and Belladere consists principally of rum and animals which are brought into Elias Piña from Belladere, and Dominican sugar which is smuggled over to the Haitian side. Textiles and kitchenware are also common contraband items from the Haitian side, much the same as during the colonial period. The flow of animals from Belladere to Elias Piña, however, represents a complete change from previous patterns. The new trend does not reflect an increase in meat production in Belladere. On the contrary, it is agreed among residents that animal raising has never been at a lower ebb. Animals bring much higher prices in Elias Piña, however, and particularly during times of drought the Haitians prefer to sell their few animals and purchase a larger volume of less expensive foods such as manioc.

Many Dominicans and Haitians alike cross the border to buy or sell in the local markets. Relatively high food prices in Elias Piña attract a small number of Haitian vendors and, conversely, the low prices in Belladere's local markets attract Dominican buyers. Dominican officials dis-

courage Haitians from crossing to the Elias Piña market and, as a rule, only Haitian women with a good command of Spanish take the risk. On the other hand, Haitian authorities follow a "hands off" policy regarding Dominicans crossing to market. Unless the Dominicans are unruly or enter Belladere carrying weapons, the Haitian authorities do not interfere with their activities.

The border is an ineffective barrier to migration and small-scale contraband. On a larger scale, however, the closed border has a very important effect on both sides of the region. Cross-border commerce, which served as a basis for the borderlands economy over the centuries, now supports only a few individuals and on a meager level. The closed border is undoubtedly a greater disadvantage for Belladere than for Elias Piña. The illegal status of the Haitian working in Elias Piña places him under constant threat of exploitation. If the Haitian is refused pay for his labor, a frequent occurrence, he has no recourse. Regarding commerce, an open flow of goods would favor the Haitians because there is simply much more money in circulation in Elias Piña than in Belladere. The Dominicans would profit little from open trade because the Haitians could afford to buy very little. The lower prices in Haiti would be an attraction for Dominicans, but the supply of many of the Haitian goods, particularly animals and animal products, is so limited that opening the border would probably cause little increase in such trade.

The advantages which the Dominicans might derive from an open border would be in commerce with Port-au-Prince. Although overland commerce was renewed on a limited scale in 1972, the traffic has been restricted to the border crossing at Jimaní-Mal Passe near the south coast.¹⁵ It is doubtful that in the foreseeable future the Haitian government will make the necessary investments in road repair and maintenance to open once again the all-weather international route by way of Belladere and Elias Piña.

¹⁵Pedro Manuel Casals Victoria, "El comercio entre Haití y la República Dominicana," Eme Eme 1 (March-April 1973):57-66.

CHAPTER VII
CONTEMPORARY AGRICULTURE AND LAND USE

Fundamentally different systems of agriculture and land use have evolved in Elias Piña and Belladere. Change has been rapid in Elias Piña, where commercial agriculture has almost entirely replaced subsistence farming. In Belladere, on the other hand, farming has changed very little. Although there has been an increase in commercial cropland (Figure 23), subsistence farming is still predominant. The two agricultural systems reflect differences in land ownership and tenure, types of crops, farming methods and traditions of communal farm labor. A particularly noteworthy contrast exists in the responses of the Dominican and Haitian farmers to their common problem, the shortening farm fallow.

Land Ownership and Tenure

A precise delineation of state and privately owned land is impossible in the study region owing to the absence of a cadastral survey for Belladere and the lack of up-to-date landholding information in Elias Piña. General ownership patterns, however, are locally known.

The largest tract of state-owned land in Elias Piña covers most of the area between Las Dos Bocas and Rinconciotos, approximately the same area which the Dominican Republic regained from Haiti by the Protocol of 1936 (Figure 13). Most Dominican farmers who settled this area after 1936 never gained legal title, but the majority of the terrain is so arid and unproductive that they have little cause for concern. Many farms in other portions of the municipality as well are on state land.¹ The Balaguer government has granted legal title of ownership to some of these lands under the agrarian reform program.

Like the rest of Haiti, Belladere is almost devoid of state-owned lands.² Most of the land is in private hands with some form of legal title. The major exception is the thirty-eight hectare coffee grove which formed part of the original Baptiste colony.³ Most land which was formerly public domain is now privately owned as a result of the squatters' rights laws which provide legal ownership after twenty years of use. Some land is held under droit habita-

¹In 1971, 668 farms in Elias Piña out of 8,075 were on state-owned land.

Dominican Republic, Oficina Nacional de Estadística, "1971 Agricultural Census of the Dominican Republic," Preliminary Tables, compiled by the Latin American Data Bank (Gainesville: University of Florida), Table 4.

²The lack of state-owned lands has been an impediment to reforestation programs which require large plots of unoccupied land.

³In 1974, this state-owned plot was under consideration as one of the sites for a United States-funded coffee development program.

tion or the "right to inhabit," which is not a clear title of ownership, but rather the right to occupy and work the land. Droit habitation is considered tantamount to ownership and is a legitimate and secure form of landholding.

In Elias Piña 43 percent of the farmers own all of the land they work while in Belladere the corresponding figure is 71 percent.⁴ The higher figure for Belladere reflects the longer history of small, privately-owned holdings in Haiti. Only 8 percent of the Haitians and 9 percent of the Dominicans depend entirely on renting; however, many more cultivate rented land in addition to their privately-owned parcels.⁵ A major drawback to renting land in Elias Piña is that renters seldom qualify for loans from the Agricultural Bank. Rental land has become scarce in Elias Piña because of the large areas which are machine-tilled. In Belladere, on the other hand, renting is increasingly common as more and more farmers inherit impractically small plots. At the same time, however, as land becomes scarcer and more valuable, large landowners are more hesitant to put their properties up for rent.

Two forms of sharecropping, "working thirds" and "working halves" are practiced in Elias Piña. Under the

⁴All agricultural data for Belladere are based on a one-percent sample of heads of households. Data for Elias Piña are from the "1971 Agricultural Census of the Dominican Republic."

⁵Dominican Republic, Oficina Nacional de Estadística, "1971 Agricultural Census of the Dominican Republic," Table 4.

"thirds" arrangement, the farmer buys the seed and finances each step in the agricultural cycle, but he then pays the owner one-third of the harvest. The "halves" arrangement calls for equal division of both costs and profits. In general, Dominican farmers consider sharecropping less desirable than renting and fewer than 2 percent report that they operate under either of the two sharecropping systems.⁶ Farmers in Belladere report that they no longer practice sharecropping because the low yields make it impractical.

Communal land ownership is still quite common in Belladere and serves to greatly complicate the cadastral situation. Many farmers own one or two small parcels and work a ti morso (a tiny bit) of communal land which they own jointly with a sometimes unknown number of relatives. Haitian farmers seem to have little concept of the size of communally-owned land; indeed, they do not seem to think of communal lands in terms of size nor of heirs in terms of numbers. Each heir has the right to cultivate any portion of a communal parcel which is not in use.

Landholdings in Belladere, on the whole, are more fragmented than those in Elias Piña owing to the longer history of farming in Belladere and to the original distribution of small landholdings by early Haitian rulers. Many landholdings in Belladere have become impracticably small

⁶Ibid.

and have been permanently abandoned by their owners. These abandoned fields account for the large amount of apparent fallow land in Belladere; however such vacant land is not available for use by the farmers who have remained in the area because it is still privately owned. By tradition the Haitian farmers have a high regard for property rights.

As a result of the abandonment of many of the unworkably-small parcels, the average size farm still under cultivation in Belladere is slightly larger than the average in Elias Piña--3.5 hectares compared to 2.7 hectares. The average number of separate farm parcels per farm is 2.6 in Belladere and 2.0 in Elias Piña, and the average size of the individual plots is 1.2 hectares in Belladere and 1.3 hectares in Elias Piña.⁷

Types of Crops

According to the 1971 Dominican Agricultural Census, important crops in Elias Piña by descending order of cultivated area were corn, manioc and pigeon peas. Types of crops varied considerably between irrigated and nonirrigated lands and between lowlands and uplands.

Rice is the most common crop found in the irrigated portions of the valley floor, principally in the vicinity

⁷Data for Elias Piña are from the "1971 Agricultural Census of the Dominican Republic," Table 1; data for Belladere are based on a one-percent field sample of heads of households, 1974.

of El Llano (Figure 24). Highest yields are obtained near El Llano where soil and water conditions are most favorable; further downstream the water supply often runs low and the soils become more permeable, factors which retard rice growing. Rice is always planted alone, rather than intercropped, and it is most frequently planted in May and harvested in October.

The great majority of farmers in Elias Piña own no irrigated land and, therefore, are not involved in rice production. The most important dry-land crop in Elias Piña is peanuts; in 1971 peanuts covered 2,592 hectares as compared to only 586 hectares occupied by irrigated rice.⁸ The peanut is an ideal crop for the loamy, permeable soils of the valley floor and it also produces well when rotated with rice in irrigated land. A peanut crop has the distinct advantage of yielding a quick return, only three months from planting to harvest, without requiring irrigation. Even the poorest farmer, if he has suitable, relatively level land, can cultivate peanuts under contract with the Manicera. While many farmers plant peanuts alone, most prefer to include occasional rows of widely-spaced corn or pigeon peas. Many farmers plant a mixture of peanuts, corn and pigeon peas in April or May so that the peanut harvest falls in August, the corn in August or September and the

⁸Dominican Republic, Oficina Nacional de Estadística, "1971 Agricultural Census of the Dominican Republic," Tables 16 and 25.



Figure 24: Irrigated Rice Cultivation in Elias Piña

pigeon peas in November. Other crops sometimes interplanted with peanuts are okra, black-eyed peas, sesame, manioc, squash, and sweet potatoes (Appendix 7 for English, Spanish and Latin translations). Peanut fields seldom contain more than three or four other types of crops, always with peanuts predominating. Three lowland farm plots selected at random contained the following: (1) peanuts, corn, pigeon peas, black-eyed peas and manioc; (2) peanuts, black-eyed peas, manioc and squash; (3) peanuts, corn and pigeon peas. Despite the popularity of intercropping, in 1971, 40 percent of all cropland was planted in pure stands.⁹

Although interplanted subsistence plots are less common in Elias Piña than they were before the coming of the Manicera in the 1930s, it is not uncommon to find small fields planted entirely to such foods as manioc, plantains, peas and squash. Most often, however, owners of such subsistence plots also own one or more larger fields which they dedicate to peanuts as their primary commercial crop.

Agriculture in the uplands of Elias Piña is generally more diversified than on the valley floor and more oriented to food crops. Peanuts grow well in the intermontane valleys at lower elevations, but slopes in most of the region are too steep for peanut production. Three cultivated fields selected at random in the mountain zone contained the following crops: (1) corn, red beans, squash, plantain, chayote;

⁹Ibid, Table 9.

(2) squash, celery (for the root), yautia; (3) corn, red beans, plantain, yautia, chayote. Other upland crops frequently grown are onions and sweet potatoes. While on the valley floor, mixtures of more than four plant varieties are rare, in the mountains it is common to find as many as six or seven food crops interplanted. When newly-cleared, the upland slopes provide a deep humus which is particularly productive of root crops such as sweet potatoes, yautia and chayote, and of vegetables such as cabbage and squash. As previously noted, most farmers who cultivate food crops in the uplands also grow peanuts on the valley floor.

Coffee production in the highlands of Elias Piña is limited primarily to supplying local demand. The 1971 Agricultural Census lists only 3.75 hectares planted to coffee in the highland region with a production of only 1,635 kilograms.¹⁰ Many coffee groves have degenerated owing to tree disease and the failure to replant. In some instances, coffee growers mistakenly believe that the deforestation laws prohibit the pruning of shade trees and have allowed the overhead canopy to become so dense that the coffee trees no longer produce.

There are two distinct seasons for both upland and lowland food crops. The primary planting season is in April or May, depending upon the rains, and the secondary planting season is in August or September, again depending on the

¹⁰Ibid.

beginning of the rainy season. In general, yields from the first season are superior.

The marketing of agricultural products in Elias Piña can be divided into the following categories: rice, which is sold directly to processing plants in Las Matas de Farfán or other towns; peanuts, for sale under contract to the Manicera; and minor food crops, which generally are sold in the local markets in the towns of Elias Piña and El Llano. The Elias Piña market operates daily but is particularly active on Tuesdays and Fridays, while the El Llano market operates only on Sundays. Traveling merchants bring in such items as tomatoes from Azua, and a wide variety of vegetables from the Cibao for sale in the markets.

In contrast with the trend toward cash cropping in Elias Piña, agriculture in Belladere is still on a largely subsistence basis; it is characterized, furthermore, by a much wider variety of food crops (Appendix 8). Lowland farm plots contain an average of nine distinct types of food crops. Plots containing from fourteen to sixteen types are common. Pure stands of any crop are almost unknown. Although intercropping makes it impossible to determine the area devoted to specific crops, field observation indicates that the most important food crops are sorghum, pigeon peas, manioc and sweet potatoes. A typical lowland plot contains the following mixture: sorghum, manioc, two or three types of peas, squash, sugar cane, plantains and

bananas. There is little difference in types of crops grown on steeply-sloping and flat lands.

Lowland commercial crops include plantains, grown in the alluvial soils near Croix Fer, and tobacco, grown in the floodplain of Lake Peligre during the low-water months from November to March. In the more arid areas the only reliable commercial crop is sisal, often planted in rows to mark property lines. Sisal was a much more common commercial crop before the 1960s when falling prices led many farmers to replace it with other crops. Currently, however, with the rising price of synthetic fibers, sisal is once again becoming remunerative.

Beginning in 1971, the government-sponsored Institut de Développement Agricole et Industriel (IDAI), began a program to encourage the planting of cotton, corn and peanuts through the granting of small loans and the provision of seed. The emphasis of the IDAI program has been on cotton production, but unsuitable soil conditions and the unavailability of fertilizers have led to a rapid drop in production. Participation in the cotton program fell from 281 in 1973 to 187 in 1974.¹¹ Unfortunately, many farmers were impressed by the idea of a government-subsidized commercial crop and took their land out of food production and sugar cane to plant cotton. The ruins of formerly profit-

¹¹These data are from the local director of the Institut de Développement Agricole et Industriel (IDAI), Belladere.

able sugar mills now stand in the midst of non-productive fields of cotton.

Coffee is still the dominant commercial crop in the Baptiste region accounting for between 18,000 and 20,000 hundred-weight sacks per year, or about 4 percent of national production.¹² Five depulping mills operate in the mountain zone. Unlike the farmers of Elias Piña, however, Haitian farmers do not depend entirely on the commercial crop; they plant a variety of food crops in addition to coffee. Surprisingly, the average number of distinct varieties per cultivated plot is slightly higher in the highlands than in the lowlands--9.1 as opposed to 8.9. Such diversity allows the Haitian coffee grower to subsist in spite of the vicissitudes of the international coffee market. Most upland farmers are aware of the danger of an over-dependence on a commercial crop. By contrast with the Dominican Republic, where crop failures and food shortages may be alleviated somewhat by government aid or relief programs, planters in Haiti must provide their own insurance. Most of the highland subsistence crops are the same as those of the lowlands, the primary exception being black beans which grow best in the higher elevations.

¹²National coffee production varies between 350,000 and 550,000 hundred-weight sacks yearly (United Nations, Développement de la production caféière [Port-au-Prince: Programme des Nations Unies pour le Développement, 31 August 1974], p. 4).

Both upland and lowland Haitian farmers tend to plant more tree crops than do the farmers of Elias Piña. Considering the past disregard for conserving the forest cover, this appreciation of tree crops appears ironic, yet the Haitian farmers typically are very proud of their fruit trees and consider them an important element of their farms. Orange and grapefruit trees are especially esteemed in Belladere and are occasionally planted in rows to form the borders of cultivated fields. In the absence of tractor plowing, which in Elias Piña eliminates all types of "volunteer" seedlings, desirable fruit trees are encouraged to grow wherever possible.

With the exception of coffee sales in the highland region, the marketing of agricultural products in Belladere is generally on a very small scale. The great majority of farmers grow food primarily for subsistence. If the harvest is good, their wives sell the surplus in any of the several weekly and bi-weekly markets located in the commune. In 1974, 84 percent of the Haitian farmers reported selling a portion of their harvest. Many Haitian women sell products in two or three different markets each week. Despite the long distances traveled and the intensity of bargaining, however, most of these transactions are on a small scale, involving no more than a few pennies. Larger market transactions are conducted by traveling wholesalers known as madame saras, who arrive by truck from Port-au-Prince on the

eve of each market day and buy quantities of produce for resale to market women in the capital city. The few relatively prosperous planters who grow plantains or other commercial crops in the river-bottom soils negotiate directly with truckers for the sale of their products in Port-au-Prince.

Farming Practices

In the study region mechanized farming is limited to Elias Piña. The two peanut-processing companies, the Agricultural Bank (Banco Agrícola) and five individuals operate modern tractors in the municipality. Despite the availability of tractors, however, relatively few Dominican farmers, a mere 7 percent, depend entirely on tractor plowing; 38 percent work the land entirely with animal-drawn plowing, and 39 percent use both tractor and animal-drawn implements.¹³ The remaining 16 percent presumably prepare their land with hand tools such as the pick and spade.

By contrast, there is no tractor plowing in Belladere. Fifty percent of the farmers attest to using ox-drawn plowing at least part of the time; field data indicate, however, that plowing is actually much less common. A team

¹³Dominican Republic, Oficina Nacional de Estadística, "1971 Agricultural Census of the Dominican Republic," Table 33.

of oxen represents an investment which few Haitians can afford. Most farmers in Belladere rely entirely on hand labor for all stages in the agricultural cycle. The hoe and machete are the most common hand tools. Several traditional Haitian implements, the broad-bladed mocha, used for digging root crops, the sickle-shaped kotodigo, used for weeding, the pick (pikua) and spading fork (besch or foosch) are in general use in Belladere. All of these Haitian tools were used throughout Elias Piña as well before the expulsion of the Haitians and the mechanization of agriculture in the 1930s. The mocha and kotodigo are still found in the zones of strongest Haitian influence, particularly in the mountain region.

Dry-land farmers in Elias Piña generally plant their lands with mule-drawn, calibrated planters, usually rented from a friend or from one of the peanut companies. These planters are unknown in Belladere where the traditional dibble stick is still in common use. The Haitian farmer digs a shallow hole with the dibble stick, drops in the determined number of seeds and covers the hole with his foot. The same method was in general use in Elias Piña prior to the 1930s and is still practiced by the poorer farmers of the region.

Both Dominicans and Haitians rely entirely on hand methods for harvesting. Dominican farmers near El Llano use a small hand sickle to harvest rice several stalks at

a time and then thrash it by striking the grain heads against the insides of steel drums which are placed in the fields. Harvesting of other crops in Elias Piña, including peanuts, is likewise entirely unmechanized.

Harvesting methods are the same in Belladere as in Elias Piña, but the nature of the harvest is basically different. While in Elias Piña the harvest takes place during specific times of the year, in Belladere it is a continuous process since no single crop dominates; rather numerous crops mature throughout the year.

The use of fertilizers, pesticides and herbicides in Elias Piña and Belladere is limited to the relatively few prosperous planters. According to rice farmers in El Llano and coffee planters in Baptiste, recent increases in the price of fertilizers have greatly reduced their use. The more prosperous Haitian coffee planters and the well-financed Dominican rice growers clearly benefit from using chemical fertilizers. From the standpoint of the small farmer, however, refusal to use fertilizer, even if its purchase can be financed by the Manicera or by the government, can be easily justified. If all factors in the agricultural cycle are favorable, yields from the fertilized crop will easily offset the added investment. In the event of crop failure, however, or simply a poor harvest--which may be entirely out of the control of the farmer or fertilizer--the farmer ends the year much more in debt than if he had planted without

the added expenses. Although fertilizers should take some of the risk out of farming, in fact, in dry-land, non-mechanized agriculture they often increase the financial risk.

Cooperative Farm Labor

Among the types of work organization found in the study region, the combite deserves special mention as one of the most characteristic traditions of rural Haiti. Similar to communal labor for a New England barn raising, the combite involves the calling together of neighbors to assist with a particular project, land preparation or the harvest. In return, the organizer of the work group provides food, drink and music during the day and an ample meal with refreshments when the work is completed.¹⁴

As late as the 1930s combites of sixty or more laborers were common on both sides of the border. Four factors, however, have brought about a decline in this custom. Firstly, the closing of the border immediately reduced the size of combites as frontier farmers could no longer assemble workers from both sides. Secondly, mechanized plowing in Elias Piña eliminated the need for communal labor in land preparation. Thirdly, in Belladere,

¹⁴According to Herskovits the combite originated in Dahomey and possibly other parts of West Africa, the homeland of many of the slaves brought to Saint Domingue. (Herskovits, Life in a Haitian Village, p. 259.)

the decline in food production has prevented most farmers from organizing work groups as they can no longer afford to furnish such large quantities of food. A fourth factor, less important than the others but of relevance, is the fact that in Belladere the spread of conservative Protestantism has led many farmers to object to providing clerín, the popular alcoholic beverage, for the workers.¹⁵ As a result of these factors, the combite has declined throughout the study region. In Belladere it is a rarity. Ironically, because of the generally better economic conditions, the combite is much more frequent in Elias Piña.

A more common communal work system in Belladere is the association, which generally consists of from six to eight neighbor farmers who agree to a daily rotation of labor in their respective fields or jardins. Participation in an association entails none of the financial burden of the combite but provides the same social contact and camaraderie which the Haitians value in their work.¹⁶

In general, the preferred work system on both sides of the study region is simply paid labor. Haitian farmers frequently state that hiring labor by the day or "buying a

¹⁵There are at least ten or twelve Protestant churches in Belladere including Baptist, Seventh Day Adventist, Nazarene, and three branches of the Pentacostal. Although Catholicism is the national religion, Protestantism is much more in evidence in Belladere.

¹⁶In Elias Piña the word asociación means a farmers' organization similar to a cooperative designed to give the farmers a forum for discussing common problems.

morning," avoids problems and obligations. The going wage in Belladere for a six-hour work day is 30¢ (U.S.). The generally accepted 50¢ (U.S.) daily wage for illegal Haitian laborers in Elias Piña is ample incentive for them to take the risk of crossing the border. By contrast, the daily wage for Dominican farm labor in Elias Piña is \$2.00 (U.S.)

Superstition in Agriculture

A long history of isolation from the influence of the Church and from technical assistance has given rise to a wide array of superstitions along the Dominican-Haitian frontier. In Elias Piña, Haitian-derived superstitions mix with local beliefs in order to provide explanation for agricultural problems. Among the uneducated majority, the success or failure of a harvest is attributed to supernatural causes, and with ready explanation in the supernatural, there is no incentive to seek remedies by heeding the advice of the extension agents. Crop failures are attributed to the evil eye (mal de ojo), or to an envious neighbor who cast a spell (echó una brujería) or "stole the flower" (robó la flor) from one's crop and put it in his own field.

Dominican frontier farmers use a variety of remedies including "good waters" (aguas buenas), available at the

local pharmacy and guaranteed to do battle with evil spirits.¹⁷ Cows' skulls placed on stakes and brightly-colored ribbons tied around the necks of animals are meant to divert the evil eye. A mixture of lemon juice and ashes sprinkled lightly over a field is said to cure diseases of the peanut plant. Farmers often allow their natural cactus fences to grow fifteen feet high or more to guard against the evil eye.

In Elias Piña, successful farmers are commonly believed to have a special helping spirit, a bacá, probably purchased from a Haitian witch doctor. Often the hired workers of successful and progressive rice farmers refuse to follow the same methods of cultivation in their own small plots because they attribute their employer's success not to his agricultural methods, but to his bacá.¹⁸

Most of these beliefs, along with an array of others associated with vodun, are also found in Belladere. Traditionally, they have served a purpose in explaining the otherwise inexplicable; however, as the remote regions are

¹⁷Aguas buenas, small vials of colored water, sell for 20¢ and 30¢ (U.S.) and include the following: Vini-vini (come, come)--to make the crops grow faster; Espanta Diablo (scare the devil)--to frighten away devils; Amanza Guapo (calm the angry)--to calm down angry neighbors who might cast an evil eye on the crops; Araza con Todo (do away with everything)--an all-purpose remedy.

¹⁸The bacá is a Haitian-derived superstition, an evil spirit which takes the form of an animal and can be used by its master to inflict injury on others. It also brings good fortune to its master, particularly in financial matters.

brought into national life and modern technology provides solutions to agricultural problems, superstitions can act as impediments to change.¹⁹ An additional and very practical negative influence of these superstitions is that many small farmers pay a substantial portion of their incomes to witch doctors in efforts either to cast or to remove spells.

The Farm Fallow

There is universal agreement among both Dominican and Haitian farmers that the fallow period has declined sharply during the present century. Owing to the variability of the landscape, the fallow was never uniform throughout the region; the river bottom lands close to the town of Elias Piña, for example, have always been cultivated with very little fallow, while in the past, the less fertile soils were farmed under a long fallow system. In many parts of the region during the early twentieth century, fallow periods of ten or twelve years with two years of cultivation were common. After cultivating a plot of land for two years the farmer moved on to an unused forest tract, felled a small patch of trees, and began the cycle once again.

¹⁹The role of vodun witch doctors or houngans in promoting or impeding agricultural change is disputed. Experienced students of vodun have argued that houngans are sometimes the most progressive people in the villages and are often willing to lend their considerable prestige to agricultural projects.

By 1974, 58 percent of the farmers in Belladere had no land in fallow; the great majority of the remaining farmers had left only very small areas uncultivated as places to tie their animals. Unfortunately, the animals are so few in number that their manure is insignificant for enriching the soil. Most Dominican farmers, however, reported that although they left much less land in fallow in 1974 than in the past, and for a much shorter period of time, they still were able to have an occasional one to three-year fallow period.²⁰ Compared with the past, however, the cultivation period is now much longer than the fallow, often six or seven years for every one or two years out of production. Agriculture in Elias Piña is clearly in a transition stage between "long fallow slash-and-burn" and "permanent intensive farming." In most portions of Belladere, the transition to "permanent intensive farming" has already been made.

There are three types of "permanent intensive farming" lands in the study region. The first two, the irrigated rice lands of Elias Piña and the alluvial bottom lands of both sides, make up a relatively small portion of the region's total farmland. The third, the dry, relatively infertile and hilly lands, which dominate the landscape in

²⁰In 1971, 10 percent of the total cropland in Elias Piña was in fallow and 11 percent was in permanent cultivation. (Dominican Republic, Oficina Nacional de Estadística, "1971 Agricultural Census of the Dominican Republic," Table 9.)

Belladere, contain a much greater area of these intensively-farmed plots.

Whether or not a Haitian farmer leaves a portion of his land in fallow is less a function of soil fertility than a consequence of the size of the landholding and the number of people who must subsist on the harvest from that plot. A farmer with one or two hectares of mediocre land usually must keep all of it in permanent production simply in order to grow enough food for his family. Through his system of inter-cropping he plants his entire parcel and, although nothing produces well, everything yields a crop. Even in the most arid and infertile sections of Belladere, one finds small land parcels which are maintained in permanent production without fallow; they are worked on a basis just as intensive as the most fertile irrigated rice land.

Responses to the Shortening Fallow

The disappearance of the fallow has tied the Haitian farmer to his small parcel of land; once his farm is no longer productive, he has no place to go. He has been compelled, therefore, to develop a system by which he can conserve his land and maintain continuous production without a fallow period. This system includes such conservation techniques as interplanting, terracing, contour cultivation, composting and mulching.

A well-developed scheme of interplanting is basic to the Haitian method of permanent non-irrigated agriculture. Agriculture in the region has always been based on the growing of a variety of food crops, but as soil fertility has declined, some of these crops which were often planted in pure stands, have been replaced by mixtures of hardier varieties which can withstand poor soil conditions. Upland rice, for example, a dominant crop and staple in the Haitian diet forty years ago, has been replaced by sorghum, invariably interplanted with several types of beans and root crops. Among the twelve to sixteen varieties of food crops in a typical Haitian field or jardin are such nitrogen fixers as pigeon peas, red beans, and peanuts. There is a very high dependence on non nutritive-demanding root crops such as manioc, malanga, yams, and several types of sweet potatoes. Most fields contain food crops during every month of the year, and only those fields which do not include long-cycle crops such as plantains or bananas may be bare during April and May, immediately before the rainy season. With most of the fields under permanent cultivation, burning is less frequent than in earlier years, thus offering a further conservation advantage.

An increasing number of Haitian farmers construct hillside terraces with brush, banana stalks, or on a more elaborate scale, with limestone rocks (Figure 25). Ninety percent of the farmers interviewed claimed to practice some



Figure 25: Hillside Terracing in Belladere

form of terracing. Most reported that they had begun terracing only within the past ten years. Some mentioned that they had learned to construct terraces during the late 1940s under Estimé's frontier development program. A few learned terracing from a United States AID-sponsored soil conservation program known as "Watershed" which operated near the study region from 1959 to 1962.²¹

Most Haitian farmers who cultivate hill slopes follow the contour as they hoe or spade in order to build up ridges to prevent soil erosion. Contour tillage is practiced even in very slightly inclined areas, but it is most in evidence on the steep slopes, and when viewed from a distance it gives the impression of elaborate terracing.

Rather than burning dried grass in the fields, most farmers turn the sod with a hoe or spade. Haitian farmers are also familiar with composting and often spade decaying plant material into their cultivated fields. Some farmers, particularly in the highlands, construct compost pits. Others practice mulching, utilizing the refuse from sugar cane. In the coffee zone, farmers carefully pile up decaying vegetation around the base of coffee trees to enrich the soil.

²¹The "Watershed" program was an integrated natural resource conservation project which focused on the drainage basin of Lake Peligre. Activities included reforestation and teaching of contour plowing, terracing, strip cropping and gully control. (Jay H. Hardee, "End of Tour Report," Port-au-Prince: U.S.A.I.D. Mission, 1960.)

The farmers of Belladere have a very clear understanding of the utility of their conservation techniques. When asked why they turn over the sod with a spade rather than burn the grass, a typical reply is, "If I burn the grass, the water washes out the soil." They also clearly perceive the erosion preventive advantages of terracing and contouring. Although their system of interplanting is not highly developed compared to some (in parts of Africa or the Philippines, for example), they understand the importance of a mixture of crops for maintaining permanent production without a fallow. Through experience they have found that by interplanting their entire parcels, the total yields, although small in terms of unit area, are more secure and the long-term effects on the soil are less harmful than if they practiced a rotating fallow system and planted only a portion of their land at a time. An indication of the success of the system is the fact that many farmers in the region have maintained their terraced and inter-cropped fields in continuous production without fallow for thirty years or more.

Most of the conservation techniques described above are unknown along the Dominican borderlands. Although some Dominican farmers are aware of the Haitian techniques, very few perceive them as relevant to agriculture in their own lands. Curiously, several Dominican farmers expressed ad-

miration for the Haitian techniques, but when asked why they did not follow the same procedures one reply was, "The Haitians seem to know more about those things than we do."

Crop rotation and limited inter-planting are the only widespread conservation techniques practiced in Elias Piña. It is commonly understood, for example, that repeated planting of pure-stand corn will result in progressively lower yields. Even the most rudimentary methods of preventing soil erosion, however, are lacking (Figure 26). Dominican farmers rightly attribute soil erosion to the elimination of stumps and debris by tractor plowing. They agree that erosion is an increasingly serious problem, and this assessment is verified by the condition of the landscape. But when asked if they know of any methods to stop the erosion, a typical reply is, "Lo que hace la voluntad de Dios" (God's will be done). Dominican farmers can afford such a sentiment only as long as there is a surplus of farmland to which they can turn when their own land becomes exhausted. On the Haitian side of the border, however, that point has long been passed.

The fundamental reason for the Dominican farmers' failure to adopt conservation techniques and intensify their agricultural system is that such changes would involve significant increases in labor per unit area of land. The construction of terraces, for example, is a long-term, laborious effort and offers no immediate rewards. Other



Figure 26: Steep Slopes being Prepared for Cultivation near Elias Piña

intensification techniques also require a greater labor input than traditional farming. In addition to the preliminary labor requirements, maintaining a plot of land in continuous production requires much more labor than does shifting cultivation.²² Among the causes for this increase in labor demand are weed problems, the heavy sod cover, and the necessity for some type of fertilization or other means of maintaining soil fertility. Traditional agriculturalists are not likely to use such high labor-intensive methods as long as they can subsist sufficiently well with less labor-demanding, more familiar techniques. Although Dominican farmers are witnessing a shortening fallow and can no longer expect the abundant yields of earlier years, they can still apparently earn enough to sustain their families. They have not yet been forced to change to a more intensive and labor-demanding system.

Despite significant differences, however, the natural resource base of the Dominican study region is in a stage of evolution very similar to that of Haiti only a few decades ago. Declining yields, the shortening fallow, increasing soil erosion and the trend to non-nutritive-demanding crops are all attested to by local farmers, government technicians and employees of the Manicera. Personal

²²For an analysis of the increase in labor required by a change from long-fallow to permanent agriculture see Esther Boserup, The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure (Chicago: Aldine Publishing Company, 1965).

observation of the eroding hillsides and interpretation of sequential aerial photographs taken during the 1940s, 1950s and 1960s verify local perceptions of the deteriorating state of the land.

Several factors may cause the process of resource depletion to be more rapid in Elias Piña than in Belladere, for example, the rapid growth of population density, the tendency to single cropping, the spiraling costs of chemical fertilizers, and the ability with mechanized plowing to cultivate much larger areas. In the near future, the fallow will be a past luxury in Elias Piña as it already is in Belladere.

Contrasts in the Farming Systems

The farmers of Elias Piña are faced with the following dilemma: in reality they no longer grow a sufficient amount of subsistence crops to feed their families; therefore they must depend on profits from peanuts for purchasing food. Peanut yields, however, are also falling and, at the same time, food prices are rising.²³ All in all, the farmers' buying power is gradually declining.

Many farmers blame the Manicera for their economic woes and consider themselves trapped into the cultivation

²³Officials of the Manicera in both Elias Piña and Santo Domingo agreed that peanut yields were declining. Statistics which could have confirmed this conclusion were not made available to the author.

of peanuts. Indeed, other crops may sometimes offer an equal or better return. Tractor plowing, however, is available only for peanut growing. Without the aid of machinery, the farmer can prepare only a small subsistence plot.

Although many Dominican farmers are dissatisfied with their ties to the Manicera and often grow nostalgic about the past when they grew all of their own food, they do not willingly return to subsistence farming. They are firmly committed to the market economy for two reasons. Firstly, mechanized land preparation spares them the most grueling and laborious step in the agricultural cycle. And secondly, they have been exposed to the advantages of a money economy. An awareness of new opportunities has come with modern communication and transportation. The flood of modern products available in Elias Piña, the possibility of schooling for the children in Santo Domingo, and the frequently-voiced goal of eventually moving to the city, are all incentives to continue cash-cropping. Although most farmers earn very little through peanut production, the possibility always exists that "next year" all of the variables in the agricultural cycle will be favorable and that they will make a windfall profit. In short, the lure of the money economy appears irreversible.

In contrast to their Dominican neighbors, most subsistence-oriented farmers of Belladere have little or no cash income, but they are able to provide adequate food for

their families. Examples of extreme malnutrition are rare. The level of nutrition appears to be about the same for the Haitians and for the rural Dominicans.

There is, however, a sense of stagnation in Belladere. In 1974, there were no successful government development programs underway in the region. In the opinion of most, the general standard of living was declining, and there appeared to be very little hope among the people for improvement.

Many Haitian farmers feel locked into a system which provides no possibility for material advancement. There is very little chance for a farmer, however ambitious, to extricate himself from a tenuous, marginal, subsistence level. The awareness of this dilemma arises from the fact that despite Belladere's isolation, it is not entirely outside the influence of the modernizing world. Improved transportation and communication have brought Belladere into much closer contact with Port-au-Prince. Inevitably, breaking down of isolation brings new ideas, aspirations and dissatisfaction with existing conditions. This process has occurred to a much greater extent in Elias Piña and the Dominican government, in effect, has faced the reality of the twentieth century by providing the possibility, through a money-based economy, of attaining some of the amenities of modern life.

The change in level of aspirations is slow in Belladere, but it is underway. At least some of the people are becoming more aware of their lot relative to conditions elsewhere. It is likely that the Haitian government will eventually be compelled to reassess its policy of indifference to rural development and to provide the avenues by which the ambitious can derive some benefit from the changing times. Without such a reassessment of policy, it is open to question whether or not the traditional Haitian ties to the land can continue to offset the growing attractions of the city.

CHAPTER VIII
SUMMARY, DISCUSSION AND CONCLUSION

This study has analyzed the development of contrasting land-use and settlement patterns along the Dominican-Haitian borderlands of central Hispaniola. The "landscape evolution" approach has been used in order to analyze such development.

The four historical periods which have been studied are as follows: the era of Spanish and French colonization, 1492-1789; the period of the Haitian revolution and its aftermath, 1790-1899; the period of modernization and development, 1900-1961; and the contemporary period, 1962-1974. Emphasis has been placed on the role of both direct and latent public policies as determinants of change. Consideration has been given not only to identifying the interaction of cultural landscape determinants over time but also to examining cartographically the effects of such determinants on the Dominican-Haitian borderlands.

Summary: Government Policies
as Long-term Landscape Determinants

For each of the four historical periods under consideration, key government policies have been analyzed for

their influence on the development of the frontier landscape. Public policies affecting land use and settlement change during the 1492-1789 period were those which led to the acquisition of western Hispaniola by the French. Early Spanish colonial concern with mining resulted in neglect of the central portion of the island. With the abrupt end of both mining and the Indian labor supply, economic emphasis turned to cattle raising which gradually established the study region as an open range, characterized by a dispersed settlement pattern. The continued Spanish emphasis on mining resulted in mass emigration from Hispaniola to the mineral-rich colonies of Mexico and Peru. Finally, the Spanish policy of evacuating the western portion of the island in an effort to curtail smuggling, had the unexpected result of providing an easy entree for the French, who soon established the colony of Saint Domingue, later to become the Republic of Haiti.

Policies of the French government which most affected the central borderlands during the colonial period began with the encouragement of buccaneer expansion into Spanish territory. After acquiring Saint Domingue by the Treaty of Ryswick in 1697, the French concern with sugar production led to the dense settlement of the coastal lowlands and the neglect of the mountainous interior and the Central Plain. As little-known and unoccupied territory, the Central Plain became a refuge of the maroons, blacks who had

escaped from the harsh slave policies of the French. The dispersed settlement pattern characteristic of the frontier region originated with these maroons.

Government policies which had the greatest effect on settlement and land use from 1790 to 1899 have been traced to events related to the Haitian revolution of the 1790s. The slave revolt itself resulted in an immediate dispersal of population from the coastal plains into the interior of the island. The Haitian government policy of distributing small land parcels, which began in 1808 and continued throughout the century, established the small property as the dominant type of landholding. This contrasted sharply with the Dominican pattern of extensive landholdings based on the Spanish land grant tradition.

The repeated Haitian invasions from 1801 to 1855 resulted in the continued sparse settlement of the San Juan Valley thereby heightening the contrast between the two sides of the frontier. Haitian militaristic policies further encouraged dispersed settlement as rural families attempted to conceal their dwellings from marauding armies. Similarly, dispersed settlement of the Dominican territory was perpetuated as rural inhabitants sought to avoid conscription into the army. Throughout the nineteenth century, Haitian militaristic policies and the financing of a large army resulted in the neglect of agriculture and of the rural sector in general. This neglect has continued to the present.

During the period 1900 to 1961 both the Dominican and Haitian governments formulated policies specifically designed to affect settlement of the borderlands. The long-term frontier development policy of the Trujillo government which began in 1937 and continued until the dictator's death in 1961, succeeded (however cruelly) in limiting Haitian infiltration into Dominican territory. By means of massive government investments, Trujillo built a network of market roads, introduced new agricultural technology, established irrigation systems, and in effect, transformed the frontier agricultural economy from a subsistence to a commercial orientation.

Although agriculture had been increasing in importance since the nineteenth century, it was only during the Trujillo regime that the dominant land use in the San Juan Valley changed from extensive cattle raising based on an open range system to farming. Owing to its long history of sparse population and extensive grazing, soil erosion and deforestation were very little advanced compared to conditions on the intensively farmed Haitian landscape.

Haitian policies toward the borderlands from 1900 to 1961 were generally passive with the exception of the frontier development policy of President Estimé in the late 1940s. Modeled after the Trujillo frontier development plan, the Estimé program succeeded initially in improving agricultural production and living conditions along the border, but it degenerated with the change of governments.

The contrast in Dominican and Haitian frontier policies was particularly evident during the 1962 to 1974 period. The Dominican government continued to emphasize most of the development programs begun under Trujillo, especially irrigation and mechanization of agriculture, while the Haitian government placed its priorities elsewhere and followed a passive policy toward the frontier.

As a result of contrasting policies, the differences between the two sides increased. The market economy-subsistence economy dichotomy was accentuated as Dominican agriculture became further mechanized and oriented to cash cropping while Haitian agriculture changed very little.

The contrast between the two regions regarding participation in national affairs increased as the Dominican government continued to expand the road network while the Haitian government made little progress toward relieving the isolation of its frontier region. Partly as a result of the difference in development policies, the population growth of Elias Piña was rapid (despite migration to the cities) while the population of Belladere remained relatively stable. The principal outlet for Belladere's excess population appears to be migration to the Dominican Republic.

Discussion

Evaluation of past government policies and their influence on the evolving frontier landscape has brought to light several recurrent themes which could be taken into consideration by both Dominican and Haitian policy makers. The recurrent themes are as follows: the importance of continuity of government policy; the need for integrated land management programs; the necessity to move cautiously when introducing change in traditional agriculture; the importance of providing alternatives if traditional agricultural methods are altered; and the need for cadastral surveys and a more thorough system of land title registration.

Historical evidence cited in this study illustrates the importance of continuity of government policy in effecting landscape change. The Trujillo program of modernizing and integrating the frontier into national life is being carried on by the present government. At this point, even if a new regime pursued a policy of neglect toward the frontier, it is doubtful that the momentum developed over the past forty years would be entirely lost.

The Haitian frontier development program of Estimé represented the opposite extreme, a short-lived scheme which, after draining the national treasury, was completely abandoned. The decaying monuments of Belladere, the over-sized public buildings and the non-functional electric system,

serve only as bitter reminders of the unreliability of government programs.

The United States-sponsored soil conservation program known as "Watershed" was also well-conceived but short-lived, and further illustrates the futility of short-term projects for creating long-range change. Although it was not begun until ten years after completion of the Peligre Dam, the "Watershed" program might have helped to control soil erosion in the Artibonite drainage basin and could have delayed the siltation of Lake Peligre. With the abrupt withdrawal of the United States mission, however, two years of labor were quickly obliterated, and very few vestiges of the project remain.

Unless there is continuity of policy, any changes begun by development programs, if they are lasting at all, are likely to be very slow to have widespread effect. It is encouraging from a "rural community development" standpoint that some of the Haitian farmers who learned to construct hillside terraces during the Estimé program of the 1940s and during the "Watershed" project between 1959 and 1962, have continued to use such techniques to the present day. These few now serve as teachers for other farmers who have belatedly come to realize the urgency of conserving their soil. Had the programs endured, however, many more farmers would have been influenced and, perhaps, the process of soil depletion would have been retarded.

The importance of integrated land management programs which would include studies of soils, vegetation, hydrology, geology, land use and social conditions, has been amply demonstrated by the Haitian government's Peligre hydroelectric project. Before the construction of the dam, deforestation and soil erosion were already in an advanced state in the Artibonite drainage basin, yet no land management program was forthcoming. To add to the chaos, there were no provisions for the hundreds of families who were displaced by the new reservoir; they simply moved into the surrounding hills, cleared more of the slopes and hastened the process of erosion and siltation.¹

The implications of the Peligre experience for the Dominican government are clear. The longevity of hydroelectric or irrigation projects, such as the reservoir at Sabaneta or future projects in Elias Piña, depends upon rational land management in the watersheds. The San Juan River drainage system, upstream from the Sabaneta Dam site, is already deforested and subject to gullying and sheetwash. Without intensive reforestation, rapid siltation will be inevitable.

The need for caution when introducing change in traditional agriculture has been indicated time and again. The historical analysis of land-use change in Elias Piña

¹There are no official estimates of the remaining lifespan of Lake Peligre; officials of international organizations, however, cite a period of less than ten years.

and Belladere illustrates the inherent complexities of changing traditional agricultural systems. Altering traditional agriculture is not only a difficult undertaking, but it also involves very high risks, for time-tested methods are often better adapted to local conditions than is the most advanced foreign technology.² The transition from subsistence to a market orientation in Elias Piña illustrates the type of problem which can arise. The resulting neglect of food crops is clearly one of the most urgent problems in the region at the present time. As part of the change to commercial agriculture, the conversion of large areas of fallow land to cultivation by mechanized means, while greatly increasing agricultural production, had the negative effect of hastening the process of soil exhaustion.

The scarcity of plows and the total lack of tractor plowing is widely lamented in Belladere, yet experience in similar terrain immediately across the border indicates that widespread use of the plow on the Haitian slopes would be disastrous. Unquestionably, machine plowing has greatly benefited agriculture in Elias Piña's alluvial bottom lands. In the hilly areas, however, which are more comparable to

²Pierre Gourou, The Tropical World, trans. E. D. LaBorde (London: Longmans, Green & Company, Ltd., 1961). Gourou relates the negative effects of the introduction of the plow in Rhodesia; these included depletion of the soil, problems of a one-crop economy, and an end to mixed planting.

Paul W. Bedard, "Shifting Cultivation: Benign and Malignant Aspects," Proceedings, Fifth World Forestry Congress (Seattle: University of Washington Press, 1960).

the topography of most of Belladere, careless plowing has contributed to soil erosion.

The recent Haitian policy of encouraging cotton production demonstrates the problems created by ill-conceived innovation in traditional agriculture. Owing primarily to unsuitable soil conditions, the program has been counter-productive in three respects. Firstly, the crop failures themselves have hurt those farmers participating in the program. Secondly, farmers have replaced much-needed food crops with cotton. Thirdly, the resentment engendered against the government-sponsored program has simply reinforced the farmers' distrust of the government and may impede future programs regardless of their merit.

The Belladere examples are especially illustrative of the unexpected problems that arise in altering agricultural systems which have evolved over time in response to local needs. Very often, the most beneficial and inexpensive approach for policy makers is to help the farmers improve their current methods rather than to replace them on the grounds of modernization.³

³Examples of improving rather than replacing current methods include instruction in terracing and the better use of mulches, introduction of additional soil-building food crops, the provision of fertilizers, aid in designing and building small-scale gravity-run irrigation projects, and the use of the hedgerows as hillside terraces.

Historical examples from both Elias Piña and Belladere illustrate the problems incurred when governments impose change in traditional agriculture without providing alternatives. The Dominican government's prohibitions on tree cutting, for example, if strictly enforced, would put an end to extensions of traditional slash-and-burn agriculture. While prohibiting extension of the former system, the Dominican government has failed to provide an alternative. Without chemical fertilizers--which are beyond the means of most farmers, or conservation techniques such as those evolving in Belladere--shifting cultivation or slash-and-burn farming provides the most efficient known method, and for many the only method of maintaining relatively high soil fertility. Until the Dominican government can provide a means for maintaining permanent production on the non-irrigated agricultural lands, it is doubtful whether the regulations against extension of slash-and-burn farming can or should be thoroughly enforced.

Fencing of the open range on both sides of the border further illustrates the problem of forced change without the provision of alternatives. Livestock raisers who had depended on open water sources for their herds, were suddenly faced with the impossibility of raising their animals within dry corrals. There were no provisions for common pasture lands or for the development of new water sources which might have made it possible to continue live-

stock raising. In short, the new regulations filled the need for more cultivated land but created an unforeseen problem of meat shortages.

It is apparent that the lack of detailed cadastral information and a land title registration system has been a limiting factor in the development of both Elias Piña and Belladere. Without clear title, small farmers hesitate to make permanent improvements. In addition, government programs, such as reforestation projects or the provision of public grazing lands, have been inhibited by lack of precise delineation of state lands. Had cadastral data been available, the largely unproductive hilly portions of Macasia (which is mostly state-owned) might have been designated as public grazing land. Similarly, the lack of cadastral information has prevented international organizations from carrying out reforestation projects in the Artibonite drainage basin.⁴ As noted, the granting of legal title to occupied state lands has already been a facet of the Balaguer government's agrarian reform program. In Belladere, however, owing to the lack of a cadastral survey, there has been no effort to utilize the numerous abandoned plots, many of whose owners have permanently left the region.

⁴Currently the United Nations is undertaking a reforestation project in the immediate vicinity of Peligre Dam. The effectiveness of the project so far is uncertain.

Conclusion

The preceding historical analysis has demonstrated how government policies have influenced the evolution of the contrasting Dominican and Haitian cultural landscapes. Of these policies, the following have been the most far-reaching: the early Spanish policy of neglect toward the region which eventually led to the ascendancy of the French in western Hispaniola; the Haitian policy of dividing the Central Plain into small agricultural properties, which, in the absence of any form of land management, resulted in serious deforestation and soil erosion; the Spanish-Dominican policy of extensive grazing based on a system of large Spanish land grants (this, in effect, ensured continued sparse population of the region and spared it the over-use which was suffered on the Haitian side); and the development policies of recent Dominican governments which have changed the agricultural orientation of Elias Piña from subsistence to commercial as compared to the continuing laissez-faire approach of the Haitian government.

Despite the long history of contrasting development between the Dominican and Haitian landscapes, Elias Piña and Belladere are currently facing the same fundamental problems of increasing demographic pressure, declining soil fertility, and shortening fallow. Both are in a state of transition between a long-fallow agricultural system, and

a system of permanent cultivation. In Belladere, the ratio of people to cultivable land is already such that most farmers are forced to maintain permanent cultivation without benefit of a fallow. Although the problem is less serious in Elias Piña, the rapidly shortening fallow will soon necessitate the use of new methods which will permit permanent cultivation in the nonirrigable lands.

The Haitian solution to the shortening fallow has been evolutionary. Methods of intensifying agriculture have developed, with very little government assistance, in response to the necessity created by growing demographic pressure and declining soil fertility. With these new methods, most farmers are able to maintain continual production on their nonirrigable lands. The weakness of the system is that, owing to the depleted soils, a relatively large amount of land is required to sustain a single family (Appendix 6). As long as excess population pressure is relieved by migration to the Dominican Republic, agriculture may remain stable, particularly as more farmers adopt hillside terracing and other conservation techniques. If migration is curtailed, however, a new release for population pressure will be needed, and it is likely to be found in increased migration to Port-au-Prince.

Plans currently underway for extending irrigation in Elias Piña are illustrative of the positive approach taken by the Dominican government toward solving its agricultural

problems. Whether or not the government will devote its full energies to such problems before growing population density and declining productivity force more rural people off their land, remains to be seen. In any event, it is certain that the Dominican Republic will not follow Haiti's evolutionary, laissez-faire approach to agricultural change. The two regions must fit into two entirely distinct national schemes--unless there are radical changes in national policies, rural Haiti will continue to be relegated to a role of isolated, food producer for the capital city, while the rural regions of the Dominican Republic will be brought increasingly into the mainstream of national life through active development policies.

APPENDIX 1
FIELD QUESTIONNAIRE*

A. Questions for Farmers

1. How long have you lived here?
2. Did you live anywhere else before? Yes___ No___ Where?
3. How many gardens do you have?
4. Where is each of your land parcels?
 - a. d.
 - b. e.
 - c. f.
5. How many (tareas, carreaux) does each of your land parcels have?
 - a. d.
 - b. e.
 - c. f.
6. Do you keep all of your land under cultivation or do you have some land in fallow?
All under cultivation___ Some fallow___
Some where animals are tied___ Comment:
7. Do you live on your land? Yes___ No___
8. Do you sharecrop any of your land? Yes___ No___
Explain:
9. Do you own all of the land you work? Yes___ No___
10. Do you rent land? Yes___ No___
11. What crops do you plant in each land parcel?
 - a. d.
 - b. e.
 - c. f.

*This questionnaire was administered in Spanish in the Dominican Republic and in Creole in Haiti.

12. Do you sell part of your harvest? Yes___ No___
What do you sell?
13. Which is the crop which you sell most of?
14. Where do you sell your products?
15. What are the main items you buy in the market?
16. Do you use fertilizer? Yes___ No___ What kind?
17. Do you burn your fields each season before planting? Yes___ No___
Explain:
18. Do you use pesticides: Yes___ No___
19. Do you plow? Yes___ No___ Do you own oxen and plow?
Yes___ No___
Do you plow with oxen or tractor?
Comment:
20. Do you plant the same thing each year in the same land?
Yes___ No___ Comment:
21. How long do you plant your land without letting it lie fallow?
22. How long are your fallow periods?
23. Do you sell part of your crop in advance (i.e., to middlemen or speculators)? Yes___ No___
Explain:
24. Do you raise any animals?
cows___ horses___ chickens___
hogs___ mules___ ducks___
goats___ donkeys___ others___
25. Do you do all of your own labor? Yes___ No___; Hire labor?
Yes___ No___; Make combite? Yes___ No___
26. Do the rains cause soil erosion on your land? (Do the rains wash the soil?) Yes___ No___
Is this a big problem at the present time? Yes___ No___
Was it a big problem when you were a boy? Yes___ No___
27. Is there anything you can do to protect your soil against erosion?
Yes___ No___ Explain:
28. What are the main problems which farmers have in this zone?

B. Questions for Village Elders

1. How long have you lived here?
2. Did you live anywhere else before? Yes___ No___
3. Did you grow the same crops when you were a young man that you grow now? Yes___ No___ Explain:
4. Did the people here raise the same type of animals when you were a young man that they raise now? Yes___ No___ Explain:
5. Does the land seem to produce as well as it did when you were a boy? Yes___ No___ Comment:
6. Have there been any changes in agricultural methods during your lifetime? Yes___ No___ Comment:
7. What other changes in agriculture have you seen during your lifetime?
8. Do the people in this area eat the same kind of foods as they did when you were a boy? Yes___ No___ Explain:
9. Do you think the people are as well-fed now as when you were a boy? Yes___ No___ Comment:
10. When you were a boy, where did the farmers in this zone sell their products?
11. Are there many more people living in this zone now than when you were a boy?
Comment:
12. Is there enough land for all the people who want to be farmers? Yes___ No___ Comment:
13. If someone cannot find land to farm, what can he do?
14. Do many young people leave this zone and go to live in other places? Yes___ No___ Where do they go?
15. Do you think it would be better with more or fewer people in this zone?
16. Do you remember when there were many more trees here or has the tree cover always been about the same?
17. Do you know when this zone was deforested? (If applicable)
Yes___ No___ When?

18. In the past were there some types of trees in this zone which are no longer found here? Yes___ No___ Which?
19. Regarding tree cutting, was there more control before Trujillo, during Trujillo, or after Trujillo? (For Dominican side only)
20. Have you noticed any changes in the grass cover in this region during your lifetime? Yes___ No___ Explain:
21. In your opinion, is life easier or harder now than when you were a boy?
Comment:

The following questions were used for the Dominican side only:

22. What were the effects of the expulsion of the Haitians during the time of Trujillo?
23. What changes have you seen during your lifetime in the relations between Dominicans and Haitians in this region?
24. Are there any Haitian customs in this zone? Yes___ No___
Comment:
25. What are the benefits or what are the negative effects of the Haitian customs?
26. Are there people in this zone who know how to speak patois?
27. In general, how are the Haitians as neighbors? As workers?
28. Have you ever been in Haiti? Yes___ No___

APPENDIX 2
YEARLY RAINFALL IN MILLIMETERS:
SAN JUAN VALLEY*

| Year | San Juan de la Maguana | Las Matas de Farfán | Elias Piña |
|------|---------------------------|------------------------|------------|
| 1939 | 823.6 mm | --- ** | 903.9 mm |
| 1940 | 993.5 | --- ** | 1468.5 |
| 1941 | 1043.6 | --- ** | 1019.8 |
| 1942 | 1083.0 | --- ** | --- ** |
| 1943 | 1081.7 | --- ** | 455.4 |
| 1944 | 789.4 | --- ** | 938.5 |
| 1945 | 1039.3 | --- ** | 1282.1 |
| 1946 | 925.5 | --- ** | 1540.1 |
| 1947 | 826.6 | --- ** | 1119.9 |
| 1948 | 815.2 | 1015.7 mm | 1342.8 |
| 1949 | 1203.4 | 946.2 | 869.1 |
| 1950 | 877.3 | 1062.4 | 1603.0 |
| 1951 | 1127.4 | 843.8 | 1844.4 |
| 1952 | 1308.1 | 1080.5 | 1997.4 |
| 1953 | 894.0 | 887.5 | 1748.7 |
| 1954 | 1005.7 | 1358.3 | 2938.7 |
| 1955 | 997.0 | 1310.9 | 2818.4 |

*Data from Department of Meteorology, Santo Domingo.

**Data unavailable for period.

APPENDIX 2--Continued

| Year | San Juan de la Maguana | Las Matas de Farfán | Elias Piña |
|------|---------------------------|------------------------|------------|
| 1956 | 911.8 mm | 1010.0 mm | 4493.9 mm |
| 1957 | 552.7 | 1137.2 | 1240.2 |
| 1958 | 901.1 | 1057.9 | 1302.1 |
| 1959 | 698.1 | 1008.1 | 1273.9 |
| 1960 | 523.7 | 1248.2 | 1738.5 |
| 1961 | 116.9 | 1055.7 | 1397.0 |
| 1962 | 678.4 | 1056.5 | 1108.3 |
| 1963 | 1193.5 | 988.6 | 1457.0 |
| 1964 | 897.7 | 1054.7 | 1679.7 |
| 1965 | 1511.5 | 1259.0 | 1443.3 |
| 1966 | 1137.1 | 1088.1 | 1108.9 |
| 1967 | 533.2 | 883.8 | --- * |
| 1968 | 1052.5 | 923.0 | 1489.2 |
| 1969 | 990.4 | 816.2 | 2412.8 |
| 1970 | 1457.1 | 893.9 | 3090.9 |
| 1971 | 1151.1 | 876.9 | 2597.9 |
| 1972 | 1014.9 | 911.7 | 1510.0 |
| 1973 | --- * | --- * | --- * |
| 1974 | --- * | --- * | --- * |

*Data unavailable for period.

APPENDIX 3
CHRONOLOGY OF EVENTS ON HISPANIOLA

- 1492-- Beginning of Spanish settlement
- 1500-1530-- Period of prosperity based on gold mining
- 1530-- Beginning of decline of Spanish colony
- 1629-- Buccaneers establish themselves on Tortuga Island and northwest Hispaniola
- 1655-- French government sends administrators to their "unofficial colony"
- 1697-- Spain cedes western third of Hispaniola to France
- 1697-1790-- French colony of Saint Domingue becomes one of the world's most valuable colonial possessions
- 1790-- Beginning of Haitian Revolution
- 1793-1797-- English invade San Domingue
- 1795-- France acquires the Spanish colony of Santo Domingo; remains in possession until 1809
- 1801-- Toussaint L'Ouverture, Haitian general, occupies Santo Domingo City
- 1801-- French army under Napoleon's brother-in-law General LeClerc invades Haiti
- 1803-- L'Ouverture is captured and imprisoned in France
- 1803-- Renewed war between Britain and France in Europe
- 1803-- French armies leave Haiti

- 1805-- Haitian armies invade Santo Domingo, are repelled
- 1821-- Colony of Santo Domingo declares its independence from Spain
- 1822-1844-- Haitian armies occupy entire island
- 1849, 1851, 1855-- Haitian invasions of Santo Domingo (unsuccessful)
- 1861-1865-- Santo Domingo is protectorate of Spain
- 1865-- Former Spanish colony declares independence from Spain and becomes the Dominican Republic

APPENDIX 4
LAND USE-LAND COVER CLASSIFICATION*

Classification System

- I. Commercial Cropland
 - A. Irrigated
 - B. Non-irrigated

- II. Subsistence Cropland
 - A. Forest Fallow
 - B. Scrub Fallow
 - C. Grass Fallow

- III. Grazing Land

- IV. Mixed Grazing Land--Cropland
 - A. Forest Fallow
 - B. Scrub Fallow
 - C. Grass Fallow

- V. Forest Land

- VI. Orchard

*This classification system corresponds to the land-use/land-cover maps of Elias Piña and Belladere (Figures 16, 17, and 23).

VII. Scrub

VIII. Water

IX. Settlement

Definitional Structure

In the definitions presented here of the type of land use or land cover included in each category, an attempt is made to explain in some detail the classification system, to avoid confusion between categories which might otherwise appear arbitrary.

To the reader unfamiliar with agricultural land use in the tropics, the different land-use categories may appear needlessly imprecise. This apparent lack of precision, however, is a reflection of the nature of land use in the tropics and illustrates important features of agriculture in the study region. In the tropics, much more than in the mid-latitudes, mixed cropping and mixed grazing-cropping, in what often appears to the outsider to be an unplanned and arbitrary manner, is the rule rather than the exception. Except in rare instances in this study it would be impossible to isolate individual crops because they are usually interplanted. Also, it will be noted that in most categories there is left open the possibility of some grazing; animals are occasionally grazed in rice stubble or in temporarily fallow agricultural land and there is inevitably some grazing in slash-and-burn areas.

I. Commercial Cropland

Commercial cropland includes those areas which are in continual or almost continual cultivation and which are dedicated principally to the growing of crops for market. These fields may be planted in either pure stands, as with irrigated rice fields, or they may be planted in a mixture of crops. Most often a portion of the production is for home consumption.

Areas designated as commercial cropland are distinguished by cultivated fields which never lose their identity even though parts of them may occasionally be left fallow for short periods of time. These areas are never allowed to revert to forest or scrub as often occurs with category II, subsistence cropland. Many commercial agricultural areas are never allowed to lie idle either because production is so intensive and high, as in a few

irrigated areas, that farmers cannot afford to leave the land out of production, or because increasing population density has made fallowing impossible for lack of space. Other areas of commercial cropland, particularly in non-irrigated areas, are occasionally left fallow for short periods; for example, Dominican farmers occasionally leave land idle for six months after the August peanut harvest to encourage a better yield the next year, and Haitian farmers often leave a small patch idle where they tie their few animals.

A. Irrigated Commercial Cropland

Irrigated commercial cropland includes land watered by either government-built or private canals. This is the most intensively-farmed land in the study region and very little of it is ever left out of production, even for short periods of time. Use of fertilizers and mechanized techniques is more common in irrigated than in non-irrigated areas. The most common irrigated crop is rice which is grown wherever edaphic conditions are appropriate. Where soils are not suitable for rice, peanuts, corn, and other food crops are grown.

B. Non-Irrigated Commercial Cropland

These areas depend on rainfall for moisture but, nevertheless are permanently cultivated or utilized with very little fallowing. Intensive agriculture on dry land is an increasingly important land use as the fallow period becomes shorter.

II. Subsistence Cropland

Subsistence cropland refers to lands which are used primarily for production of food for home consumption rather than for sale. Invariably this category includes areas which are used principally for the growing of crops but which, rather than being completely covered with cultivated fields, are only dotted with farm plots, often widely spaced. Because of their small size, often temporary nature, and frequent wide spacing, the individual fields are not mapped. Instead, the general area where such agriculture predominates is shown. These farm plots may be either of the slash-and-burn or permanent type depending on a number of factors. The slash-and-burn plots are transitory in nature and generally are cultivated for only one to three years after which time the farmer clears and cultivates a new plot of land allowing the first to recover its fertility through a period of fallow. Such a system requires that the farmer have sufficient land at his disposal to utilize only a small percentage of it at any one time. Many farmers in the

subsistence cropland areas do not possess this surplus of land and therefore are forced to maintain their farm plots in continuous production. These continually-producing fields are found side by side with slash-and-burn plots on the same type of land with the same level of fertility. They have evolved into continuously-producing fields only after a long process of repeated division of landholdings has eliminated the fallow. Farm plots in the subsistence cropland category may be found in areas of forest, scrub or grassland.

A. Forest Fallow

This refers to subsistence farming areas which revert to forest when left fallow.

B. Scrub Fallow

Subsistence farming areas which revert to scrub when left fallow.

C. Grass Fallow

Subsistence farming areas which revert to grass lands when left fallow.

III. Grazing Land

This category defines those areas in which the principal land use is the grazing of cattle, horses, goats and hogs. Before the fencing of the open range, animals grazed freely throughout the study region including in those areas also used for cultivation of crops. Such grazing appears, therefore, under the heading Mixed Grazing Land--Cropland. Only those few areas which showed evidence of the presence of animals in the absence of cultivated fields were delineated as grazing land.

IV. Mixed Grazing Land--Cropland

As indicated, this category is a combination of cropland and grazing land. Before the end of the open range the combination of grazing and cultivation was the most common use of the land. Almost all of the land was grazed to some extent. The end of the open range came gradually on the Dominican side of the border with the spread of officially designated agricultural colonies and agricultural zones; the open range in Haiti ended in the 1960s. The mixed grazing land--cropland category does not appear, therefore, on the 1974 land-use map.

A. Forest Fallow

This category includes land which reverts to forest when not being cropped.

B. Scrub Fallow

This refers to land which reverts to scrub when not being cropped.

C. Grass Fallow

This includes areas which revert to grasslands when not being cropped.

V. Forest Land

The forest category consists largely of pine and mixed pine and hardwood forests found in the higher altitudes in the southern part of the study region. These areas may have occasional slash-and-burn plots but in general they are not exploited agriculturally. It should be noted that hardwood forests which once covered much of the lower elevations have been replaced by scrub growth, grasslands or cultivated fields. Most of the remaining hardwood forests are in the Dominican Republic along river banks where tree cutting has long been prohibited by law.

VI. Orchard

This category includes lands devoted mainly to coffee production. Subsistence crops are also grown in these areas, but coffee is dominant.

VII. Scrub

Scrub refers to lands whose main vegetation is low scrub growth, much of it thorny, rarely exceeding fifteen feet in height. This is principally mesquite and several types of cactus. Many areas of present-day scrub were used in the past for cattle grazing and slash-and-burn agriculture, but poor management practices have reduced their fertility and usefulness. Nevertheless, scrub land may contain a few goats and donkeys and an occasional slash-and-burn plot.

VIII. Water

This category is applicable only to the Haitian side of the study region where Lake Pekigre forms the only significant water body other than several rivers which are too narrow to appear on the land use-land cover map.

IX. Settlement

This category refers only to the few settlements of over 1,000 population. Smaller towns in the study region, none of which has over 200 inhabitants, are represented on the maps by black dots.

APPENDIX 5
AVAILABLE POPULATION DATA, ELIAS PIÑA AND BELLADERE

| Place | Year | Population | Density | Source of Data |
|------------------------------|------|------------|-----------------------|----------------|
| Elias Piña (Municipality) | 1950 | 12,530 | 35.2/km. ² | Census |
| " | 1960 | 19,970 | 56.1/km. ² | Census |
| " | 1964 | 21,423 | 60.2/km. ² | SNEM* |
| " | 1969 | 24,184 | 67.9/km. ² | SNEM |
| " | 1970 | 25,833 | 72.6/km. ² | Census |
| " | 1974 | 28,814 | 80.9/km. ² | SNEM |
| Elias Piña (Town) | 1950 | 1,468 | | Census |
| " | 1960 | 2,750 | | Census |
| " | 1964 | 2,745 | | SNEM |
| " | 1969 | 3,842 | | SNEM |
| " | 1970 | 5,099 | | Census |
| " | 1974 | 5,111 | | SNEM |
| Belladere (Commune) | 1950 | 19,797 | 65.9/km. ² | Census |
| | 1964 | 20,016 | 66.6/km. ² | SNEM |
| | 1969 | 20,538 | 68.3/km. ² | SNEM |
| | 1971 | --- ** | --- ** | --- ** |
| | 1974 | 25,038 | 80.3/km. ² | SNEM |

*National Service for the Eradication of Malaria.

**Data unavailable for period.

APPENDIX 5--Continued

| Place | Year | Population | Density | Source of Data |
|----------------------|------|------------|---------|----------------|
| Belladere) (Town) | 1950 | 1,234 | | Census |
| | 1964 | --- * | | --- * |
| | 1969 | 2,100 | | SNEM |
| | 1971 | 2,207 | | Census |
| | 1974 | --- * | | |

*Data unavailable for period.

APPENDIX 6
AGRICULTURAL DATA SHEET*

| | Dominican Republic | Haiti |
|--|-------------------------|-------------------------|
| <u>Demography</u> | | |
| Born on same farm | | 58.07% |
| Born in same commune or municipality | | 63.90% |
| Born in other commune or municipality | | 27.90% |
| Haitians born in Dominican Republic | | 8.20% |
| <u>Land Holdings</u> | | |
| Average number of plots/farm | 2.08 | 2.54 |
| Average size of plots | 1.28 hectares | 1.48 hectares |
| Average size of farms | 2.70 hectares | 3.43 hectares |
| <u>Land Tenure</u> | | |
| Owner-operated | 43.40% (of total farms) | 70.97% (of total farms) |
| Rented | 9.30% " | 8.07% " |
| Sharecropped | 1.50% " | 0.00% " |
| Rented/Sharecropped | 1.30% " | 0.00% " |
| Rented/Owner-operated | 0.00% " | 19.35% " |

*Data for Elias Piña are from the "1971 Agricultural Census of the Dominican Republic," Preliminary Tables compiled by the Latin American Data Bank, University of Florida. Data for Belladere are from a 1 percent field sample of heads of households, 1974. Blanks indicate that no data are available.

APPENDIX 6--Continued

| | Dominican Republic | Haiti |
|-------------------------------|-------------------------|-------------------------|
| <u>Land Tenure--Continued</u> | | |
| Land Reform | 0.03% (of total farms) | 0.00% (of total farms) |
| State-owned | 19.20% | 0.00% |
| Usufruct | 7.10% | 0.00% |
| Other simple forms | .17% | 0.00% |
| More than one form of tenure | 18.10% | 0.00% |
| <u>Mechanization</u> | | |
| Animal power only | 38.40% (of total farms) | 50.00% (of total farms) |
| Machine power only | 7.22% | 0.00% |
| Animal and machine power | 38.50% | 0.00% |
| Hand labor only | 15.80% | 50.00% |
| <u>Agricultural Methods</u> | | |
| Use chemical fertilizer | | 1.61% (of total farms) |
| Use insecticide | | 0.00% |
| Leave fallow | | 41.94% |
| Leave no fallow | | 58.06% |
| Burn fields | | 41.38% |
| Burn only brush piles | | 15.52% |
| Never burn | | 43.10% |
| Practice terracing | | 90.00% |
| <u>Work Organization</u> | | |
| Use combite | | 34.00% |
| Hire laborers | | 40.00% |
| Do own work | | 95.00% |

APPENDIX 6--Continued

| | Dominican Republic | Haiti |
|--------------------------|--------------------|-------------------------|
| <u>Marketing</u> | | |
| Sell part of harvest | | 83.89% (of total farms) |
| Sell nothing | | 16.11% |
| Sell in advance (future) | | 6.45% |
| <u>Animal Raising</u> | | |
| Oxen | .44 per farm | .32 per farm |
| Milk cows | | |
| Hogs | 3.58 " | 2.87 " |
| Goats | 4.05 " | 1.72 " |
| Chickens | 12.40 " | 6.85 " |
| Ducks | | .19 " |
| Horses | 1.04 " | .31 " |
| Donkeys | .65 " | .11 " |
| Mules | .29 " | .15 " |

APPENDIX 7
COMMON CROPS IN THE STUDY REGION

| Haitian Creole | Dominican Spanish | English | Latin |
|-------------------|----------------------|-----------------|---------------------------------|
| Café | Café | Coffee | <i>Coffea arabica</i> |
| Can A Suc | Caña de Azúcar | Sugar Cane | <i>Saccharum officinarum</i> |
| Cresson d'Eau | * | Water Cress | <i>Nasturtium aquaticum</i> |
| Banan | Plátano | Plantain | <i>Musa sapientum</i> |
| Diri | Arroz | Rice | <i>Oryza sativa</i> |
| Fig Banan | Guineo | Banana | <i>Musa paradisiaca</i> |
| Jumu | Yauyama | Yellow Squash | <i>Cucurbita maxima</i> |
| Mai | Maiz | Corn | <i>Zea mays</i> |
| Malanga | Yautía | Yautia; Malanga | <i>Xanthosoma sagittifolium</i> |
| Manioc | Yuca | Manioc | <i>Manihot esculenta</i> |
| Militon | Chayote | Chayote | <i>Sechium edule</i> |
| Patat | Batata | Sweet Potato | <i>Ipomoea batatas</i> |
| Pistash | Maní | Peanut | <i>Arachis hypogaea</i> |

*Not commonly found.

APPENDIX 7--Continued

| Haitian Creole | Dominican Spanish | English | Latin |
|-------------------|----------------------|----------------|--------------------|
| Pois Beurr | * | Butter Bean | Phaseolus vulgaris |
| Pois Congo | Guandul | Pigeon Pea | Cajanus indicus |
| Pois France | * | Field Pea | Pisum sativum |
| Pois Inconnu | * | Black-eyed Pea | Vigna unguiculata |
| Pois Noir | * | Black Bean | Phaseolus vulgaris |
| Pois Rouge | Habichuela | Red Bean | Phaseolus vulgaris |
| Pom de Ter | Papa | Irish Potato | Solanum tuberosum |
| Roroli | Ajonjoli | Sesame | Sesamum orientale |
| Shu | Repollo | Cabbage | Brassica oleracea |
| Ti-mil | * | Sorghum | Pennisetum glaucum |
| Verengen | Berenjena | Eggplant | Solanum melongena |
| Yam | Ñame | Yam | Dioscorea alata |
| Zonion | Cebolla | Onion | Allium cepa |

*Not commonly found.

APPENDIX 8
LOCAL PRODUCTS IN BELLADERE MARKET, MARCH 29, 1975*

| <u>Creole</u> | <u>English</u> |
|---------------|----------------|
| <u>Foods</u> | <u>Foods</u> |
| Banan | Plantain |
| Berenhen | Eggplant |
| Can A Suc | Sugar Cane |
| Canel | Cinnamon |
| Carot | Carrot |
| Chadek | Grapefruit |
| Citron | Lemon |
| Cocoe | Coconut |
| Cresson d'Eau | Water Cress |
| Diri | Rice |
| Eshalot | Shallot |
| Fig | Banana |
| Jumu | Yellow Squash |
| Mai | Corn |
| Manioc | Manioc |
| Patat Blanch | Sweet Potato |
| Patat Rouge | Sweet Potato |
| Perci | Parsley |
| Pistash | Peanut |
| Pois Beurr | Butter Bean |
| Pois Congo | Congo Pea |
| Pois Inconnu | Black-eyed Pea |
| Pois Noir | Black Bean |
| Pois Rouge | Red Bean |
| Poireau | Leek |
| Pom de Ter | Irish Potato |
| Rapadoo | Brown Sugar |
| Roroli | Sesame |
| Shu | Cabbage |
| Ti Mil | Sorghum |
| Tomat | Tomato |
| Yam | Yam |
| Zonion | Onion |

*All of these products are from Belladere commune. No corresponding list is included for the Elias Piña market because many of those products are brought in from other regions.

APPENDIX 8--Continued

| <u>Creole</u> | <u>English</u> |
|---------------|----------------|
| <u>Meats</u> | <u>Meats</u> |
| Kosho | Pork |
| Poisson | Fish |
| Bef | Beef |
| Cabrit | Goat |
| Pool | Chicken |

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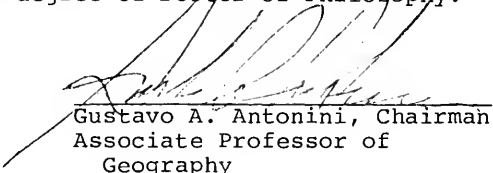
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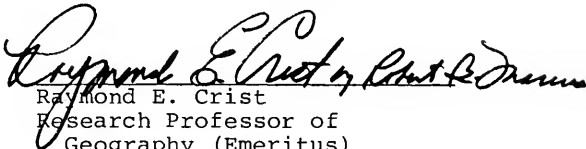
BIOGRAPHICAL SKETCH

Ernest Charles Palmer was born on January 28, 1943, in Austin, Texas. He received a B.A. degree in liberal arts from the University of Texas, Austin branch, in 1965, and then worked in eastern Bolivia for two years as a Peace Corps Volunteer. Upon returning to the United States, he earned an M.A. degree in Latin American Studies at the University of Texas. During 1970 and 1971 he was Assistant Professor of English at the Industrial University of Santander in Bucaramanga, Colombia. In 1971 Mr. Palmer entered the Ph.D. program in the Department of Geography, University of Florida. On two occasions he taught courses in the Department of Geography, "Middle America and the Caribbean," and "Physical Geography." During the summer of 1973 he worked for the Association of American Geographers in the office of the Chief Geographer of the United States Geologic Survey. For twelve months during 1974 and 1975 he conducted dissertation field research along the Dominican-Haitian border. Mr. Palmer is married to the former Ann Lucinda Walbridge.

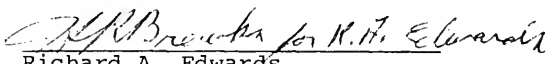
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