1993

Peasant Subsistence in Northwestern Haiti: Geography, Cultural Ecology, and Rural Development.

Edward Cameron Britton
Louisiana State University and Agricultural & Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_disstheses

Recommended Citation
https://digitalcommons.lsu.edu/gradschool_disstheses/5488

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.
INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
Peasant subsistence in northwestern Haiti: Geography, cultural ecology, and rural development

Britton, Edward Cameron, Ph.D.
The Louisiana State University and Agricultural and Mechanical Col., 1993
PEASANT SUBSISTENCE IN NORTHWESTERN HAITI: GEOGRAPHY, CULTURAL ECOLOGY, AND RURAL DEVELOPMENT

A Dissertation
Submitted to the Graduate Faculty of Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in The Department of Geography and Anthropology

by Edward Cameron Britton
B.A., University of Tennessee, 1977
M.S., University of Tennessee, 1983
May 1993
ACKNOWLEDGEMENTS

The author wishes to acknowledge and to thank all of the many men and women who supported this study. Some of them gave technical guidance in the study itself, while others provided encouragement and support of a different sort. Foremost in helping bring this project to fruition was professor William Davidson. Notable advisors include Don Vermeer, Kent Mathewson, Miles Richardson, Kam-biu Liu, Anthony Lewis, Ken Paxton, Loren Scott and Katie Nelson. The work is much improved for their input, and any remaining imperfections are the responsibility of the author alone. Gratitude is in order to Hal Horan, Linda Lee, Phil Woodland, Andrew Vining, Dan Durway, F.C.Barnes and Joe Ligon. The many folks who helped in Haiti include Jane Acacia, Michele Rashnavadi, Wectnick Paul, Babette Wainwright, Marcia Murray, and many others who welcomed a stranger in their midst with grace and dignity. Lastly, a special word of appreciation goes to my wife, Elizabeth, who has borne much, and for a long time.
TABLE OF CONTENTS

ACKNOWLEDGEMENTS ........................................... ii
LIST OF TABLES ............................................ vi
LIST OF FIGURES .......................................... vii
ABSTRACT .................................................. ix

CHAPTER

1. INTRODUCTION ............................................... 1
  Background: Witnessing History ............................. 6
  Rural Haiti: Painting the Cultural Landscape .......... 11
  Objectives, Methodological Underpinnings, Methods .... 22
    Objectives ........................................ 22
    Methodological Underpinnings .......................... 23
    Methods .......................................... 28
  The Contributions of This Work ........................... 32

2. THE LAND AND ITS USE ..................................... 39
  Land: Characteristics of the Study Area ................ 39
  Land: Conserving the Most Precious Resource ........... 40
    Land As Space .................................... 44
    Land With a Vertical Dimension ...................... 45
    Hope For the Land Resource of Haiti ................ 55
  Land Tenure: The Rules of the Game ..................... 63
    Permutations of Tenure ................................ 64
    Unclear Titles, Practical Reasons .................... 65
  The "Typical" Farm .................................... 74
    Diversity: A Little of This, a Little of That ........ 78
    Subsistence or Commercial? .......................... 82

3. FOUNDATIONS OF RURAL SUBSISTENCE ...................... 85
  Staple Food Crops .................................... 85
  Root and Tuber Crops: The Hidden Harvest ............... 88
    Sweet Potato ..................................... 93
    The True Tropical Yam .............................. 98
    Manioc ........................................... 101
    The Potato .................................... 106
    Other Root and Tuber Crops .......................... 108
  "Maize, Beans and Squash:" Are Haitian Food Crops ... 108
    "Latin American?" ................................ 108
    Beans and Peas .................................. 111
    Maize ........................................... 114
4. THE IMPORTANCE OF LIVESTOCK ON PEASANT FARMS .......... 122
   Goats in Haiti: Small, Docile, Unrelentingly Hungry ......................... 124
   From Asset to Liability .................................. 125
   Goat Hides and Leather .................................... 132
   Humble Hen and Fighting Cock ............................... 135
   Hogs in Haiti: Ups and Downs, Social Reverberations 140

5. EXPORT CROPS IN HAITI: MACROECONOMICS ON THE DOORSTEP 151
   Coffee: The Troubles of the Leading Cash Crop ...... 151
      Production Review .................................. 152
         A Matter of Scale .................................. 155
         Shading ..................................... 157
         Mulching .................................... 157
         Pruning .................................... 159
         Fertilizer .................................... 159
         Improved Varieties ................................ 160
         New Plantings ................................ 161
         Yields ...................................... 161
   The Coffee Market: Local and Global .................. 163
      Marketing Cooperatives ............................... 164
      International Competition ........................... 165
      Haiti's Loss, Central Africa's Gain? .......... 166
   Summary ........................................ 174
   Haiti's Sugar Cane Industry: From "One of its
      Principal Riches" to "Almost Complete Collapse". 175
   Citrus: Unrealized Export Potential? .................. 179

6. RURAL DEVELOPMENT IN HAITI: LOOKING AHEAD ........... 188
   Geographers and Development .............................. 188
   What Development Is Not .................................. 190
   The Basic Needs Approach ................................ 195
      Food and Nutrition ................................ 197
      Water, Fit For Drinking ................................ 200
      Health Care ..................................... 203
      Literacy and Education ................................ 206
      Employment and Income ................................ 207
   People Participating in Policy-Making .................. 214
   Sustainable Development, Renewable Energy .......... 216
      Why An Emphasis on Energy? ........................... 216
      The Nuances of "Power" .............................. 218
      Energy Alternatives ................................ 222
         Solar Energy .................................. 223
         Wind Energy ................................... 226
         Hydroelectricity ................................. 228
         Alternative Combustibles ......................... 230
   Putting it All Together: Hybrid Systems
      at the Proper Scale ................................ 232
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Viny crops of the conuco</td>
<td>53</td>
</tr>
<tr>
<td>2. Legumes for soil improvement in Haiti</td>
<td>57</td>
</tr>
<tr>
<td>3. Haitian land tenure</td>
<td>66</td>
</tr>
<tr>
<td>4. Roots and tubers production</td>
<td>90</td>
</tr>
<tr>
<td>5. Roots and tubers importance tiers</td>
<td>92</td>
</tr>
<tr>
<td>6. Sweet potato and yam variety names in Haiti</td>
<td>94</td>
</tr>
<tr>
<td>7. Plant names associated with goats</td>
<td>133</td>
</tr>
<tr>
<td>8. Potential swine feeds</td>
<td>150</td>
</tr>
<tr>
<td>9. Common coffee shade trees</td>
<td>158</td>
</tr>
<tr>
<td>10. Comparing coffee countries: Haiti, Burundi, and Rwanda</td>
<td>170</td>
</tr>
<tr>
<td>11. Citrus fruits in Haiti</td>
<td>180</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The nine départements of Haiti</td>
<td>2</td>
</tr>
<tr>
<td>2. Places named in the text</td>
<td>4</td>
</tr>
<tr>
<td>3. Dry ... leeward side of Morne Haut Piton</td>
<td>5</td>
</tr>
<tr>
<td>4. A representative homestead in the Jean-Rabel basin</td>
<td>12</td>
</tr>
<tr>
<td>5. The mango ... is one of the most common trees still standing</td>
<td>17</td>
</tr>
<tr>
<td>6. A hillside jadin of maize and sweet potato</td>
<td>18</td>
</tr>
<tr>
<td>7. A tough way to make a living</td>
<td>19</td>
</tr>
<tr>
<td>8. Northwest Haiti: topography ... precipitation</td>
<td>30</td>
</tr>
<tr>
<td>9. Geologic transect of the northwestern peninsula of Haiti</td>
<td>31</td>
</tr>
<tr>
<td>10. Monthly rainfall and evapotranspiration in Northwest Haiti</td>
<td>41</td>
</tr>
<tr>
<td>11. A polyculture (jadin) perched on a ... hillside</td>
<td>48</td>
</tr>
<tr>
<td>12. When an upland watershed ... concrete fence post</td>
<td>51</td>
</tr>
<tr>
<td>13. Maize intercropped with a legume, peanuts</td>
<td>59</td>
</tr>
<tr>
<td>14. Looking ...hedges ... along the contour</td>
<td>61</td>
</tr>
<tr>
<td>15. Close-up of folk housing: a ti kay</td>
<td>75</td>
</tr>
<tr>
<td>16. This could be a typical peasant farmstead...though ... sheet metal roof</td>
<td>76</td>
</tr>
<tr>
<td>17. The physic-nut, <em>Jatropha curcas</em>, medicinal herb</td>
<td>80</td>
</tr>
<tr>
<td>18. Castor ... palms of Christ ... purgative</td>
<td>81</td>
</tr>
<tr>
<td>19. Descended from ... the conuco ... one of the most common associations of crops</td>
<td>86</td>
</tr>
<tr>
<td>20. A starchy staple ... stalk of plantains</td>
<td>87</td>
</tr>
</tbody>
</table>
21. Just ... maize and two varieties of sweet potato .. 97
22. Mounds of the true yam ... checkerboard pattern ... 100
23. Taro pond ........................................... 109
24. Pigeon peas or pois kongo .......................... 116
25. Not sorgum, but maize ... four to the hole ........ 118
26. Maize storage in the husk ... the gwann .......... 121
27. The gentle little goat, arch despoiler ............... 128
28. Swine restocking program underway ................. 144
29. Shade-tolerant polyculture: yams, coffee .......... 153
30. More polyculture: bananas, yams, coffee .......... 154
31. Importers of Haitian coffee ........................ 167
ABSTRACT

Geographers are challenged to explain "the why of where." This study grapples with "whys" of peasant subsistence in contemporary rural Haiti. Cultural ecology, one of the fundamental themes in cultural geography, examines the interplay between cultural traditions and the realities of subsistence in a given physical environment. Haitian cultural traditions derive from a rich mélange of folkways from West Africa, Indian Middle America, and Western Europe. The land is semiarid and hilly in Northwestern Haiti, the poorest, driest, and most sparsely settled of Haiti's provinces.

Crops and livestock betray traditional preferences in foodways, and reveal much about the constraints of the land. This study examines crops such as the roots and tubers that come from various culture realms but that particularly emphasize Haiti's African heritage. The predominant species of livestock, goats, chickens and hogs, fill roles required of them both by human society—place in voodoo ritual, ease of marketing—and by constraints of the land—the need to forage and browse in wasteland scrub.

While cultural geographers generally focus their attention on material manifestations of culture on the landscape, non-material culture traits are influential upon the local genre de vie, or way of life. Religion and belief systems are commonly accepted subjects of geographical
systems are commonly accepted subjects of geographical inquiry, yet this study gives more attention to a parallel cultural construct, local political traditions and how they interrelate with and influence rural subsistence strategies. Among the rural folklife elements with strongest political implications are land tenure customs, coffee marketing mechanisms, maize storage methods, and the rationale behind the selection of root crops. These factors are compounded with the troubles of three of Haiti's most important agricultural industries—coffee, sugar cane, and swine. This paper calls attention to the convergence of these impacts upon the Haitian peasant.

The ensemble of demands of rural subsistence is summarized with the "basic needs" approach to development. Groundwork is laid for an alternative rural development plan based on economic resources now relatively underexploited. Citrus cultivation is reexamined in the context of international markets. Renewable energy resources are re-evaluated in light of changing technology.
CHAPTER ONE
INTRODUCTION

"Rural subsistence." What do these words mean in the unique and troubled land of Haiti today? Haiti is predominantly a land of farmers, but for many in Haiti today farming has become a precarious undertaking. Haitians struggle to make sense of the changes taking place in their country. Foreign scholars attempting to study Haiti from afar are even more likely to be confused by the tangle of romantic exaggeration and ethnocentric disinformation regularly appearing before them. How does a cultural geographer interpret the special land and people of Haiti?

Haiti was chosen because of the author's familiarity with French language, his attraction to "far away places with strange-sounding names," and a curiosity to understand the extremes of human living conditions. These informal criteria led to Haiti, broadly regarded to be the poorest country of the Americas. Within Haiti, the criteria pointed to the Northwest region, the poorest and driest of Haiti's nine departments (in French, département—see fig.1).

At the very inception of this study, the author took to heart the geographer's challenge to explain the "why of

1Perhaps related to the last item is the writer's familiarity with his native Appalachia, another relatively less-developed region where deforested hills, soil erosion, and rural poverty are not at all uncommon.
Fig. 1. The nine départements of Haiti
Thus was launched an effort to explain "why Haiti is so poor," or "why Haiti is the poorest nation of the Americas," as a prelude to improving the human condition there. Along the way other questions arose. Is all of the topsoil really gone? Are Haitian peasant cultivators truly "subsistence farmers," or are they market-minded before the seed is planted? All of these refugees—are they just fleeing economic hard times? Is there any hope for alleviating the problems of Haiti? Sometimes scholars find themselves woefully short of concrete answers, and uncomfortably replete with troubling questions.

To clarify some of the questions and to begin to generate some of the answers, I sought out first-hand knowledge of Haiti. Investigative forays in the Northwest province were projected out from a pied-a-terre or base of operations at the regional capital of Port-de-Paix (fig.2). A port of almost 20,000 people, Port-de-Paix and its urban scenes quickly faded from view on day-hikes toward the southwest, where the crossing of a ridgecrest brought one to the semi-arid leeward slopes overlooking the Trois-Rivieres Valley (see photo, fig.3). Later on, similar short hikes were taken radiating out from Jean-Rabel, a town now

---

²Scholar of Haiti Paul Moral (1967: 101) said that to understand Haiti, one had to observe the peasant world, its places and activities, that there was no substitute for direct experience, and use of any alleged "documentation" was risky and fallacious, as the peasant life was a life without archives.
Fig. 2. Places named in the text.
Fig. 3. Dry—800 to 900 mm of rain annually—leeward or western side of Morne Haut Piton ridge in Northwest Haiti. With an environment degraded by the cutting out of virtually all small trees for fuelwood, and with the loss of topsoil from the desperate cultivation of marginal sites, this land is left for the goats.
infamous for tragedy in the "far Northwest." Still later, Gros Morne served as the hub of investigations. Though the town is technically just outside of the Northwest political division. Gros Morne is something of a gateway to the region, and a halfway station on the hot and gritty ride from Gonaives to Port-de-Paix.

With this writer's very first field observations in 1984, sensationalist exaggerations in the popular press—"there are no trees left in Haiti"—were exposed as serious distortions of the "true picture." and yet that picture did not easily come into focus. Numerous interviews with Haitian agronomists, American agricultural development officials, representatives of international aid programs or "Private Voluntary Organizations" (PVOs), and with the peasants themselves, began to stir further assumption-crumbling rumblings and began the germination of a new set of questions. Could it be that Haiti, as a country, still possesses sufficiently abundant natural resources to feed and fuel a substantially more vibrant rural economy? If this is so, then why is Haiti "so poor" and torn by such turmoil?

Background: Witnessing History

Said an official who asked not to be identified...
"Most of these people do not have a legitimate fear of persecution"... The official said that economic conditions were the main reason most of the refugees left Haiti.

The passage quoted above calls attention to just one of many difficult contemporary social issues that are tangential to rural subsistence in Haiti. While the nuances of social and political issues are subtle and elusive—not simple, discrete nor even safe to pry into—they are unquestionably intertangled with aspects of daily subsistence in rural Haiti. An examination of these factors of daily subsistence—the ways of a folk economy, how they traditionally make a living there—constitutes the largest part of this dissertation. However, an understanding of the "hows" of peasant folkways, cannot be separated from the less tractable "whys."

Are Haitian refugees to the U.S.A. "merely economic refugees" without political vulnerabilities back home? Would the formation of an economic marketing cooperative in a Haitian community in any way threaten existing local structures of political power? If so, would repercussions follow? When members of grassroots peasant cooperatives build grain barns that are burned by night-riders, are we witnessing something "merely economic" and removed from politics? Was the 1987 massacre of activist peasants at Jean-Rabel economic or political? Is land reform—an issue raised by the democratically elected president Aristide just before his overthrow by the military—"economic," or "political," or ... both?
The field research for this project began with a reconnaissance in summer 1984, during one of the last years of the "president-for-life," Jean-Claude Duvalier. The field investigations—intended to examine rural land use and ethnobotany—proceeded with two more extended stays of several months in 1986, and concluded with a final brief follow-up trip in the summer of 1987.

This unintended time-hopping of multiple trips afforded an opportunity to witness history-in-the-making in a series of window-views or installments that spanned from the later years of the Jean-Claude Duvalier regime, the euphoric weeks immediately after his overthrow in the spring of 1986, the chaotic beginnings of working out a new political order six months later, and finally a time of growing impatience, frustration at forestalled expectations, and disillusionment from Haitian citizens in the summer of 1987. Again, the focus of this research was to have been largely agronomic and modestly limited to the distribution patterns of a few food crops. However, an imperative to identify the most relevant and meaningful explanatory factors in Haitian geography necessitated a change of focus. Milestone events in the remaking of Haiti were taking place daily, watershed events in redefining the national character. What conscientious scholar of Haitiana could ignore them?

The topics of Haitian social upheaval and agriculture are not without linkages. The 1980s was a decade of
tremendous fundamental disturbances in the national economy of Haiti, which has traditionally been based almost entirely upon agriculture. Not only has mounting population growth placed a gradually tightening noose upon the natural resource base of Haiti—particularly upon cropland—but this decade has bracketed a series of other major disruptions in Haitian agriculture. The disrupted industries are as follows:

1. The coffee industry—Haiti's largest earner of export income—was buffeted in the 1980s by unfortunate concurrences of natural calamities, and irregular on-and-off policies of international market regulation, culminating in an especially bad year for Haitian coffee in 1987.

2. The cane sugar industry—coffee's only legitimate rival as a commodity of established national stature—experienced even more trouble than coffee in terms of international supply/demand imbalances. While coffee problems hurt small producers in Haiti, sugar industry problems probably had more far-reaching impacts on wage labor, both at large mills in Haiti and as cane cutters contracting out their labor in the neighboring Dominican Republic. The situation deteriorated throughout the 1980s until no sugar at all was exported from Haiti in 1985, and the last sugar mill—the single largest employer in all of Haiti—closed its doors in 1987.
3. The livestock industry was rocked by a nation-wide swine plague which struck Haiti in 1978. It was swiftly followed by a nation-wide campaign to wipe out remaining disease hosts—all remaining hogs in Haiti. This was eventually followed by a restocking effort using breeds of large hogs foreign to the tropics. This last element of the program has been especially controversial with Haitian farmers. But in 1984 no trace of pig or pork could be found. The national dish—pork griot—no longer existed! Another part of the significance of total absence of hogs in Haiti lies in the loss of, what Street (1960:352) had once called, the number one investment choice for the peasant farmer who is able to get a few dollars ahead. The cherished "bank account on the hoof" for so many countryfolk had vanished. It happened quite suddenly, and it was widely perceived that somebody was behind all this.

Who can say to what extent these staggering blows to the rural economy of Haiti contributed to the socio-political upheaval of the mid-1980s. Most of the political activism was at its hottest in urban areas of Gonaives and Port-au-Prince. However, the modest rural farmer—80% of Haitians live in the countryside, at least 60% work in agriculture—grew commodities that were marketed by urban speculators, merchants, and their processing workers. And the food that the small farmer produced was sent toward the hungry families of Gonaives, Cap-Haitian, and Port-au-
Shortages and jacked-up prices were accordingly passed along via shrewd intermediaries. The impact of rural problems is felt by all Haitians.

Rural Haiti: Painting the Cultural Landscape

On a sawed-off chair by the powder-dusty roadside, a young Black woman waits. She patiently, passively awaits the infrequent motor vehicle or the far-commuting walker in hopes of vending her stack of casabe ak mamba—flat, dry griddlecakes of manioc meal smeared with spicy-hot peanut butter. Behind her a goat warily peeks through a hedge of candelarbre cactus. The cactus seems out of place in this scene, defiantly green in a parched brown milieu (fig. 4).

Such images characterize peasant existence in dry Northwestern Haiti. Here existence is marked by poverty and want, and is desperately pegged to commercial exchange. A bitter irony finds people who traditionally placed a high value on independence and self-determination, living today in the capital city in the menial service of strangers. And regions that for many decades exported a wealth of coffee, cane sugar, and tropical hardwood, depend today upon the charitable infusion of money back into the rural provinces.

The manioc cakes, the cactus hedge, the goat and the Black vendor woman are all elements of the cultural landscape of Northwestern Haiti. A cultural landscape is a composite of natural and human-made elements variously
Fig. 4. A representative homestead in the Jean-Rabel basin in the arid Northwest. This vicinity receives about 600-700 mm of rainfall per year, half that of the wetter eastern or windward end of the department.
shaped, neglected, managed, or abused, but always imprinted by the activities of humankind. The Haitian cultural landscape is typically rural and bears the imprint of the primary economic activities of farming and forest clearing.

A cultural landscape in Haiti or virtually anywhere else, is dynamic and ever-evolving. In Haiti the most important driving force in the changing landscape is the burgeoning human population. Over a decade ago, Haiti had one of the highest physiological population densities in the world, with over 500—perhaps over 700—people per km² of cultivable land (Weinstein and Segal 1984: 134; Margaritis and Pisani 1985: planche 9, I.B.). In the ensuing decade, the population is judged by the author to have grown from 4.8 million in 1978, to 6.1 million people in 1988, an annual increase of 2.7% despite heavy emigration during the 1980s. A few other countries of Hispanic Middle America have higher rates of natural increase than Haiti, including El Salvador, Honduras, and the Dominican Republic. Yet Haiti has a higher percentage of its women presently in their child-bearing years (48%) than El Salvador or Honduras, and a higher percentage of its population under the age of 15 (40%) than does the Dominican Republic (World Bank 1991: 254, 256).

To put population in perspective, Haiti has about one and one-half times the population of Louisiana, crowded into one fourth of the state's area, or the area of the
eight "Florida parishes" of southeastern Louisiana. Combine this density with the fact that 80% of the Haitian people live in the countryside and try to make a living selling each other their produce, while their "gardens" are plagued by frequent droughts. That summarizes Haitian rural subsistence.

Urban centers and urban fringe areas literally teem and seethe with the bustling movement of people. Here are throngs of people commuting, vending, carrying, and sometimes begging. But even in the most remote rural zones of Haiti one can expect to always find human occupants locked in an intimate struggle with the land to wrest away some form of economic gain. This process of drawing out a subsistence from the land may take the form of cutting down stunted trees—perhaps the last trees in the immediate area—for making charcoal (figs. 3,4). No less common is the grazing of goats along roadsides or on other pieces of land of uncertain or problematic ownership. Sometimes the goats are temporarily tethered, watched over by small boys. Nearer to the owner's home the goats may roam free, their necks festooned with triangular frames or yokes that serve to keep the curious and omnivorous goats from entering the narrow doorways of the houses.

Here and there the changing cultural landscape in Haiti reveals nontraditional elements that represent the uneven and piecemeal modernization of Haiti's economy. For
example a tractor on a bottom-land sugar or banana plantation may be indicative of the well-capitalized gwo neg, or Haitian upper middle-class entrepreneur. He may dabble at farming, but probably receives more income from land rentals. While he maintains roots in "les provinces," his orientation is towards the seat of power and finance, Port-au-Prince, or even overseas with friends and relatives in New York, Miami, and Montreal. Alternatively, the tractor may be associated with one of the many church-related international development projects, of which more will be said later.

Admittedly, the tractor is an infrequent element of the cultural landscape. Its presence is limited and in no way representative of the peasant majority or their small hillside cultivated plots. In fact, the vernacular term for the plot of field crops cultivated by the peasant is somewhat ironic: jadin, which comes from the French term for "garden." However most Americans would be in error if they equate the Haitian jadin with the vegetable garden of the Eastern United States, or with a lush, blooming "Garden of Eden," or even a "rose garden." The Haitian jadin is likely to be covered with dust, mulched with stones and surrounded with beaten dirt paths and thorny shrubs or cacti. The more carefully nurtured "garden" is the dooryard garden nearer the dwelling, termed the lakou.
The fringes of the lakou will boast some of the more romantic or exotic tropical food treats—sweet little lady-finger bananas, musky papayas as big as small melons, and the legendary mango (see fig.5). Bananas and mangos are more likely if the homestead lot is favored with a patch of relatively moist soil. This might result from topography—the presence of a water-channeling depression, or from the cooling shade of still larger trees. However farmers will hedge their livelihood almost every time with hardier drought-resistant crops: expect to find pigeon peas, bitter manioc, and castor bean. Moral (1961: 199) conveyed this element of risk and doubt when he reported cultivators speaking of recently planted fields as crops essayées or crops presently "attempted" (fig.6, 7).

Is this degree of desperation visible on the landscape? It probably is apparent to the trained observer. If the actual cutting of fuelwood is not witnessed, it is difficult to overlook the sooty gray sacks of charcoal stacked by the rural roadside. Later the assembled sacks will be collected by a truck making the run to the Port-au-Prince market. Equally distinctive is a coppiced tree with its gnarly trunk starkly prominent in the absence of large limbs. Larger branches are hacked away for fuel and small ones are heavily pruned for goat forage.

The assembly of interrelationships bonding the people of a particular culture with the land they occupy
Fig. 5. The mango, *Mangifera indica*, of the Old World, is one of the most common trees still standing in Haiti. Though scarcity of all wood sometimes causes the mango to be cut for saw timber as witnessed by the author, the tree is traditionally respected enough to leave it standing. It provides valuable shade for coffee shrubs, and yields its golden fruits in late spring. Moral (1961: 203) quotes an old proverb that says, in essence, during mango season, all heads are lifted up.
Fig. 6. A hillside jadin of maize and sweet potato just above Port-au-Prince. In foreground is bare ground recently burned for a second relay of planting. Within 200 meters of a middle-class residential neighborhood, this may well be a squatter's field planted on a cobble-strewn hillside of public "no man's land."
Fig. 7. A tough way to make a living: interplanted clumps of maize and manioc on a stony hillside overlooking the nation's capital city, Port-au-Prince.
constitutes the central theme and focus of cultural ecology. If cultural ecology revolves around the complex of interactions between land and culture, then effective programs of "development" must first examine the specific elements of culture and features of the land in the place to be developed. No less important is an examination of the linking interactions themselves: the mutual influences and exchanges between land and people, as well as an awareness of and respect for the environmental limits of technology.

Among the very best linkages or integrating elements between a culture and the land are domesticated plants and animals (Carter 1974). Cultivated plants were carried by people of a specific culture to a place with a specific natural environment. As the northern parts of Ghana, Benin (once Dahomey), and Nigeria share a climate similar to that of Northwestern Haiti, it is no coincidence that one finds in all of these places, major roles played by the same crops—sorghum, cowpeas, groundnuts, castor, okra, melons, mango—and by goats, as well.

Amid the flows of energy and material—resources and by-products—are movements of less tangible cultural traits. After this "cultural baggage" of traits has diffused or otherwise been transported to a particular place, it becomes sorted and culled or modified and adapted to that place within the constraints of the physical environment. This
complex of exchanges and interactions progressively evolves over the years, decades, and centuries. As stable societies and economies emerge from this process, each one is associated with a system of behaviors and assemblage of cultural traits that satisfies the ensemble of human needs required for survival in that place.

In 1984, a Haitian agronomist, Robert Cascagnol, pointed out to the author that virtually all of the peasant's basic needs of rural subsistence—food, fuel, fiber, building materials, and medicine as well as some income for exchange—are required to be met from a very small parcel of land. The petit habitant or peasant farmer is not cut-off from the cash economy, but cash flow is of such low volume that each of the above necessities usually are met through harvesting some sort of plant material, either domesticated or wild. This indicates a role in applied rural development for not only the agronomist, but also for the ethnobotanist. Plant lists appearing in this study emphasize the multiple roles of various domesticated plants in the local agro-ecosystem. A list of annual food crops indicates a secondary but significant role as soil conservation ground cover. The list of coffee shade trees is laden with trees that are first and foremost fruit trees.

Why place this emphasis on the ensemble of survival or subsistence needs? It is contended in this study that not enough attention has been given to this multiplicity of
basic needs for human subsistence.³ Though rural peasants know farming best, they are not wedded to that enterprise when alternative endeavors will more fully meet the diversity of family needs. While the pace of outmigration quickened in 1991 in correspondence with worsening political prospects, there is no denying that economic difficulties in the land were eminently influential in encouraging people to leave—or in discouraging them from staying. Something is just not working out there in the Haitian countryside, "les provinces." The latter portions of this study are less concerned with peasant farming per se, and more concerned with alternatives to alleviate rural poverty in Haiti.

Objectives, Methodological Underpinnings, and Methods

OBJECTIVES

The ultimate aim of this work is to achieve a greater understanding of how the land resource is used in the Haitian national culture. Kniffen (1960: 20) succinctly phrased this pursuit as an effort "to know the land and its people," akin to Mikesell's (1979: 358) explaining "the why of where." A goal of this nature might be sufficient as an

³There is a "Basic Needs" school of economic development theory, of which more will be said later in this paper. That broad approach seems to have enjoyed more prominence a decade ago. In recent years a short-term-wrangling-of-maximum-profit-per-investment-dollar-per-region rationale has resurfaced in the present atmosphere of reduced availability of investment funds.
end in itself." However, both of the above geographers articulated more specific objectives, as well. Mikesell (1962: 22) wrote that the "amelioration of human living conditions" is one of the most important goals of cultural geography, although this is often not made explicit by professional geographers. Kniffen (1960: 22) noted that an understanding of how a culture uses the land is crucial to even modest attempts at changing a people's way of life and the associated landscape. To have a chance of being accepted by Haitians, introduced alternative crops and practices must be analogous to, and compatible with, those of the existing agro-ecosystem. This understanding of a system, within a cultural context, cannot be entirely parceled out to a fragmented team of specialists; decision-makers need a grasp of the interrelated whole, the "big picture."

METHODOLOGICAL UNDERPINNINGS

Methodology is more than an enumeration of the methods actually employed in a study. It involves to a great extent the scholar's perception of what is the essence of his or her field. As such, any scholar's methodology is undeniably

Kniffen (1979: 59) gave a concise summation when he wrote, "I am quite willing to believe that the ultimate task of geography is to describe sections of the earth in a learned, useful manner." This is not "mere description," as the two qualifiers "learned, useful manner" imply an analytical probing below superficialities, and placement within a context of contemporary relevance.
influenced by that of individuals who have gone before. In their history of modern geography, James and Martin (1981: 188) paraphrased a contemporary French geographer, Paul Claval: "it is through personal contacts with teachers in seminars that all philosophical options involved in a methodological statement can be transmitted."

Undoubtedly there is a wide range of "philosophical options" and interpretations among geographers of what a methodology ought to be. This writer came to the Louisiana State University Department of Geography and Anthropology—the only graduate level academic coupling of geography and anthropology in this country—for the expressed purpose of learning geography directly from the keepers of the flame of the tradition of the late Carl O. Sauer. Sauer, former president of the Association of American Geographers (AAG), was recently lauded as "one of the luminary geographers of the twentieth century, worldwide" (Geoffrey Martin, guest lecture at LSU 3/18/86).™

Climatologist John Leighly (1976: 340-1) in a tribute to his illustrious colleague Sauer, first quoted Sauer himself, and then explained further in discussing methodology in the "Berkeley tradition" of American geography:

™Geographer Nigel Allan once gave a more pithy characterization of Sauer as "the Babe Ruth" of cultural geography.
"I do think that our scientific end is an understanding of how things came to be. Physical geography does seem to be natural history, and human geography culture history." The simple question "how things came to be," applied to whatever is seen in the field, makes unnecessary all convoluted arguments about the nature and methodology of geography ... "Method" is specific to the question of how a particular thing "came to be."

Marvin Mikesell, another Berkeley product and more recent president of the Association of American Geographers (AAG), wrote (1987: 147) of his own steeping in the Berkeley tradition, "If you had a research problem judged to be of significant interest and could discuss it intelligently with a very intelligent group of faculty members, then you were ready for your Wanderjahr. Little was said about research design or methodology." Elsewhere Mikesell (1979: 358) built upon Sauer's "how things came to be," to declare that all geographers were "united by a commitment to a riddle: the why of where."

A conservator and refiner of the Sauer tradition, Fred B. Kniffen, built the LSU Department of Geography and Anthropology, and many years later was in turn paid tribute by colleagues with a Festschrift in his honor. There, anthropologist W.G. Haag and geographer H.J. Walker (1974: 4) assembled nuggets of Kniffen wisdom on geography, and in the section "On Methodology" they quoted him:

The concept of an occupation pattern or complex consisting of a number of interrelated, functioning parts constituting a whole is the heart of geographic methodology in dealing with man's imprint on the earth.
The present study scrutinizes just such a "complex consisting of interrelated, functioning parts constituting a whole," in the complex of Haitian rural subsistence issues. While many of the most salient and significant components of the rural landscape complex are treated here first as piecemeal topics, efforts are made in this study to identify and explore linkages between these components. The study of linkages or relationships between a culture and the land is quite simply the definition of cultural ecology, which "has traditionally provided the focal point for the academic discipline of geography," according to Terry Jordan (Jordan and Rowntree 1976: 21), possibly the most widely-published historical and cultural geographer in this country today. Is there a rigid, narrow formula for method and methodology within cultural ecology? Phil Porter (1990: 3), recent chairman of the Cultural Ecology Specialty Group of the AAG, took pains to make clear that his specialty group "welcomes geographers whatever their particular way of doing ecological research."

It is commonly accepted that the doctoral dissertation must capture and interpret original data. A part of the data presented in this study is made up of discrete culture traits observed in the field by this investigator. An example would be an assemblage of domesticated plants, identified in its context in the cultural landscape of rural Haiti. Yet, perhaps an even more important type of data—
though more subtle to grasp—is constituted of the very linkages and relationships themselves, already explicitly mentioned as worthy objects of study. Are these culture/land relationships "observable phenomena?"

The relationships resist depiction as clearly observable data, yet their impacts can be recorded in the graphic images of a changing landscape. Such visual images can depict the dynamic nature of forces presently at work (such as water in soil erosion, illustrated later in fig.12) but also may serve as a baseline of the present, a milepost along a timeline for future comparative studies.

The culture/land relationships themselves are distinguishable, but they can hardly be conceptualized without reference to their poles or end points. The multiple elements to be linked must first be identified and described before the more abstract linkages can be "seen." Thus, cultural ecology is inherently broad in scope and by its very nature often defies containment as a simplified resolvable "problem."

This complexity and the awkwardness of grappling with it need not be apologized for, according to the cultural geographers Marvin Mikesell and Edward Price. Mikesell (1978: 2) valued a quote from Price, who was honored by his professional peers to be chosen to write the "cultural geography" section in the *International Encyclopedia of the Social Sciences*. Price (1968: 129) said that cultural
geography is "not a self-sufficient field of study that produces all of its own data and examines them as part of a closed system," but that it represents "an exchange in which data and interpretations from many sources are examined from one general point of view." Just such a breadth of sources is drawn upon here in an effort to explain both the idiosyncracies and the common humanity, the "why of where," of the troubled land of Haiti today.

METHODS

In a classic interpretation of cultural landscapes, albeit set far from Haiti. Andrew Clark (1959) explained the variation of cultural landscapes on Prince Edward Island in Canada. There, the great degree of ethnic diversity of the island's people segregating themselves into distinct settlements, provided the independent variable of ethnicity. The relative uniformity of the physical environment on that island allowed that component of the cultural landscape to be held constant. In Haiti one finds the opposite situation. Harold Wood (1963: 22) wrote that Haiti bore similarities with other parts of the humid tropics, but it

....differs from most other tropical areas in its history. Here, the effect of past events has been to suppress rather than to enhance local racial, social, and cultural variations. In few parts of the modern world will one find so homogeneous a culture and so classless a society as in rural Haiti.
Yet, Haiti's land exhibits an extreme degree of physical or natural diversity. One can hypothesize that a diversity of derived cultural landscapes will result from human strategies of coping with such a varied land endowment, and that these cultural landscapes will reflect covariation with differences in climate, topography and lithology. The next step would be to direct one's path of observation and data collection so as to maximize this physical diversity.

The peninsula corresponding with the Northwestern region is configured for an obvious systematic sampling strategy. Rainfall decreases dramatically along a gradient from the 2000 mm mean annual rainfall of the windward slopes of the northeasternmost corner of the province, to the sub-500 mm mean annual rainfall on the leeward southwestern shore of the peninsula (see map, figure 8). Topography and geologic parent material vary greatly along this same line, as one moves from the coral-crusted northeastern shore, across the axis of the Massif du Nord, the Trois Rivieres Valley, over the massif of Terre Neuve, and thence down to an arid calcareous coastal plain (see fig. 9).

"Linear sampling" was essayed in rough accordance with this transect route (Lounsbury and Aldrich 1979: 112-114; Wheeler 1970: 43-9; Blaut 1967: 187-99). Observations of crop combinations were recorded and cultivators were interviewed as to their underlying rationale. Often
Fig. 8a. Northwestern Haiti: topography (meters)

Fig. 8b. Northwestern Haiti: precipitation (mm), with mean annual isohyets, and spot values for 10 stations. Source: Hargreaves and Samani (1983). Saint-Vil (1985)
EXPLANATION

- Qal: Alluvium
- Ca: Andesite
- Tep: Bedded Limestone
- Tom: Impure Limestone, Shale, and Sandstone
- Mcs: Impure Limestone and Schist
- Cdq: Quartziferous Diorite

Fig. 9. Geologic transect of the northwestern peninsula of Haiti. Source: modified from Butterlin (1960: 100).
informants related folk proverbs that provided especially illuminating insights into how Haitians view and use their land. While some of these proverbs find their way into print (McConnell and Swan 1945; Courlander 1960), the tradition revealing how the land is perceived is largely oral. Oral tradition has proved valuable in the research of many social scientists. Fred Kniffen (1974: 254) wrote of the contemporary human geographer:

Today the geographer better deserves a place among behavioral scientists. This is because of his increasing interest in what might be termed the psychological aspects of culture as they motivate behavior with respect to the land: value systems, environmental perception, the whole range of cultural rationale.

Commonly-held values reflected in the lore of the culture convey perceptions of not just “world view” as an abstraction, but of specific expectations and intentions of resource use in the immediate agro-ecosystem.

The Contributions of This Work

The contributions of this work on rural subsistence in Haiti are five-fold.

Firstly, this work updates: given here is a contemporary account of salient aspects of rural subsistence. This writer would hasten to defer to the more comprehensive works of Paul Moral (1961), Le Paysan Haitien, and John Street (1960), Historical and Economic Geography of
the Southwest Peninsula of Haiti. However, these two works, along with a concise and balanced study by H.A. Wood (1963), are all thirty years old—written over a generation ago. Moral (1955, 1967) published other work of note on Haiti, but that is now similarly dated. Street (1960) carefully and thoroughly detailed coffee growing and swine culture. Yet he would not live to see the great perturbations that were to befall those industries in the 1980s, and those stories need to be told.

Secondly, this work juxtaposes and integrates discussions of complementary sectors of Haitian agriculture. Multiple problems, usually discussed at the national scale, are pulled together here in the context of implications at the local level. As a counter example, note that an excellent study of recent problems in the Haitian sugar industry (MacDonald and Fauriol 1991) never mentions the word "coffee," Haiti's most important export. However, the juxtaposition of these troubled industries permits the framing of some fresh questions. What was the combined effect on the small farmer, of dwindling coffee profit, coupled with loss of hog income? What is the effect of increasing landlessness—stemming from both the degradation of arable land, and the hereditary fragmentation of farm units—combined with a loss of rural wage opportunities in sugar processing or tourism services?
To answer these questions individually and to identify explicitly the impacts would require more narrowly-focused analysis in rural sociology or economics at the household level. In this study a premium is placed on breadth to create a synthesis or summary that outlines some of the new realities of 1980s Haitian agriculture and pulls them together in their mutual contexts. The author is not aware of other contemporary works that have done that. The one that comes closest is an excellent interpretation of political tensions of the late 1980s. *The Rainy Season* by journalist Amy Wilentz (1990). Though her book is not primarily about farming or land use, these issues are not ignored in her study of politics and society. This dissertation does the opposite, beginning with a look at the rural economy, but identifying its social and political interconnections. General questions call for multi-faceted approaches. Individual sections of this dissertation initially stand alone but ultimately are interconnected by themes of change in the 1980s decade, underlying political ramifications, and the balance between economic pragmatism in rural subsistence and the conservation of cultural traditions.

Thirdly, this work illuminates the obscure. Illuminated here are relatively obscure works such as those of geographers who publish only in French: Moral (1955, 1961, 1967), Girault (1977, 1981, 1984, 1985), as well as works of
human geography in English that deserve greater recognition: again, the work of Street (1960), Lundahl (1979, 1984) and Maguire (1979, 1984, 1989). The latter geographer may well understand the Haitian peasant better than any non-Haitian. Informative studies by Haitian researchers are often intended for direct practical application, including research reports commissioned by the faculty of agriculture—Faculté d'Agriculture et Médecine Vétérinaire, or FAMV (Coimin 1980, 1981; Desrouilleres 1981; Olivier 1981, etc.). Georges Anglades (1974) wrote an informative geography of Haiti. Pierre-Charles (1967) wrote from exile in Mexico and thus was freer to speak more bluntly of Haiti's underdevelopment. Lastly, Justin (1915) is an example of Haitians who as far back as the turn of the century ventured to identify social and economic problems in their country and to propose action. These latter works, when encountered at all in the U.S.A., appear only in French.

One other way this work illuminates is the shedding of light upon a region, the Northwest, relatively neglected in both programs of economic development, and as a subject of academic inquiry. The author knew middle-class Haitians with college educations in Port-au-Prince, who had never been to Port-de-Paix, the capital of the Northwest state and only about a three hour drive away. They said they had heard that it was poor and dirty. While citizens of these two Haitian cities are only a short drive apart, they appear
to be much further separated by a gulf of perspective, priorities and world view. On the other hand, Port-de-Paix is only a little over 20 miles from Jean-Rabel, one of the larger towns in the same province. Yet these towns are physically separated by the Trois Rivières, unbridged in its lower course (see map, fig.2). To drive between these two towns would require leaving the state, and going south to Gonaïves and thence northwestwards over rutted roads through gullied badlands, for a trip of perhaps three to four hours. The Northwest knows isolation in many forms.

While a conscious decision was made to broaden this study to examine general events in the agriculture of Haiti as a nation, most of the specific illustrations are taken from the Northwestern region. These are supplemented with observations made in the mountains to the south of Port-au-Prince, and in the vicinity of Hinche in Haiti's central plateau region. Care is exercised in identifying specific locations, as these regions differ significantly in characteristics such as climate, topography and degree of remoteness from major markets (see map, fig.2).

Fourthly, an attempt is made in this study to rectify oversimplifications. Allusions have already been made to some of these distortions in the first few pages of the introduction. Others—such as past condescending dismissals of the likelihood of Haitians working for a common goal in cooperatives, or gross generalizations about what is in
reality a diverse and complex physical landscape—will be refuted later in this paper. Let the reader judge whether depictions in this work are noticeably in contrast to assertions found in contemporary news accounts.

Fifthly and ultimately, this work represents an effort to evoke or characterize the totality of "what it's like there." There is distinguished precedent for this approach in Carl Sauer's (1941) classic "The Personality of Mexico," in Max Sorre's (1948, transl. 1962) "The Concept of Genre de Vie," in E. Estyn Evans' (1973) The Personality of Ireland, and most recently in Robert C. West's (1993) Sonora: Its Geographical Personality. Writing that evokes the essence of place has been both lauded and criticized in the work of geographer Donald Meinig. Meinig affirmed (1979: 2) that the interpretation of cultural landscapes necessitates a degree of impressionistic evaluation. This methodology was endorsed for rural Haiti in some of the later work of Paul Moral (1967: 101), "Le <<Faciès Agraire>> Haitien: Définition - Problèmes." Here he coined the expression "faciès agraire," which might be translated to "agrarian facies," or "the rural aspect" or "the countenance of rural life." Each of these images is a composite, striving to portray rural life in its totality. One is rightly reminded of John Fraser Hart's The Look of the Land (1975), although that study draws heavily on the settlement history records of the U.S.A., as well as material culture relics in
landscapes left behind by people. In Moral's rural aggregate image, there is more of a presence of people as active elements in the scene.

Certainly what is unfolding in Haiti today is no mere exercise in settlement history, land use planning, or agronomy. It is an ongoing human tragedy. No writer can make you feel what a Haitian feels. This writer can never experience that himself. Even a video documentary might more effectively communicate an image. However, if the readers can be made to utter to themselves, "I never realized Haitians had to contend with that," then something worthwhile has been contributed here.
CHAPTER TWO
THE LAND AND ITS USE

Land: Characteristics of the Study Area

The Northwest is one of nine provinces or départements of Haiti (fig.1). Its area is 2330 km$^2$ (or 900 mi$^2$)—smaller than the state of Rhode Island (1200 mi$^2$) and just larger than the average parish in Louisiana (700 mi$^2$). In 1971, the Northwest had a population of roughly 250,000, and was the most sparsely inhabited of Haiti's provinces with a population density of only 93 people per km$^2$, compared with Haiti's national average of 156. A decade later when the national average had risen to almost 200 people per km$^2$, the Northwest rural commune or ward of Baie de Henne averaged only 42, in a zone of bona fide desert on the leeward coast.

The leeward southwest coast of the northwest peninsula receives only about 500 mm, or 20 inches of rain per year, while sun and wind give a high evapo-transpiration rate all year-long. (Hargreaves and Samani 1983: 7 and Appendix A; Saint-Vil 1985: planche 6). Much of the aridity or lack of precipitation can be explained by the rain shadow effect. The largest part of the province is on the leeward side of Morne Haut Piton (fig.8). This ridge, along with the large off-shore island, La Tortue, lies perpendicular to the prevailing northeasterly trade winds. Moisture-laden winds
are deflected upwards by orographic lifting and the cooling air dumps rain upon the near or windward slopes of this eastern end of the province---2000 mm per year. Caribbean climatologists (Granger 1985: 35) emphasize, however, that sharp wet-dry seasonality of rainfall distribution renders reliance upon annual mean totals to be deceptive (see fig.10). Virtually any part of Haiti's Northwest can suffer planting time droughts, and soil-scouring downpours in the same calendar year.

Land: Conserving the Most Precious Resource

Land, along with labor and capital, is one of the economist's three fundamental factors of production. Paramount among contemporary issues in Haiti are questions of land tenure—who has access to land, how much of it, and how that changes relative to population increase. Yet issues of land distribution will be rendered moot unless the qualitative degradation and quantitative loss of the land resource is arrested. What is the outlook for physical deterioration of the land surface itself? What about loss of arable land through loss of topsoil?

"Loss" or "deterioration" both imply temporal comparison between conditions in the past and present landscapes or resources. The researcher is immediately faced with the problem of finding some sort of historical baseline upon which to base ongoing comparisons.
Fig. 10. Monthly rainfall (—-—) and evapotranspiration (-----) in Northwest Haiti.
Can the question, "Does Haiti have less arable land than when last measured?" be resolved with a yes-or-no answer? If a scientist is to test a hypothesis that arable land is being lost, there is a need to measure, to quantify this attribute. Zimmerman (1986: 256) however, warned about a deceptive insistence upon numbers. He pointed out that foreign experts judged 29% of Haiti's land to be "suitable for planting," while 43% of it was in fact cultivated. In the traditional swidden farming system, exhausted fields (no longer "arable"?) were "abandoned," leaving them to be replenished by a bush fallow that restored fresh organic matter and nutrients into the soil. Is the field again "arable" at the end of the swidden cycle? Half-way through the fallow period? If it no longer produces a crop of prized maize or sweet potato, but only gives a handful of low value pigeon peas?

Moral in his classic work _Le Paysan Haitien_ (1961: 121) also discouraged attempting to calculate extent of cultivable land, and deems such efforts deceptive (_illusoire_). He also saw problems in definition of terms, in the dynamic nature of a landscape in transition, and in peasants constrained by a lack of resources that if available, might permit reclassification of land from "uncultivable" to "cultivable."

In the introduction to _Land Degradation and Society_, Blaikie and Brookfield (1987: xvii) noted that if technical
research alone would suffice to turn around land degradation, tangible results would have proceeded long ago from such early works as Jacks and Whyte (1939). They went on to emphasize that social scientists must exert more attention to the questions of why peasants and other "land managers" are "so often unwilling or unable to prevent such accelerated degradation." Note here a contemporary appeal by Brookfield, who might be termed the dean of cultural ecologists within geography, calling for more inquiry into the "whys" or the rationale behind peasant land use.

In *Topsoil and Civilization* (1974: 7,194), soil scientists Carter and Dale gave evidence that many countries that are today poor, with land now degraded, were once wealthy and powerful. They counseled nations that are now prosperous to reassess population growth and resource consumption, or else follow the same paths to an inevitable decline in standard of living.

Land as a physical resource might be divided into 1) space—*lebensraum*, settlement frontier, etc.—and, 2) topsoil, a fertile medium for supporting primary production or food plants for man and beast. What are specific characteristics of the land as a physical resource?

Haiti is subject to all of the ravages of a wet tropical climate. Torrential downpours scour at the ground's surface and leach out minerals below. Relentless heat accelerates chemical processes and rapidly breaks down
organic matter—stumps, roots, and surface litter—that might otherwise hold soil in place.

The topography of Haiti predominantly hilly. Gravity exerts its inexorable tug on the topsoil of the uplands, pulling it down toward the base level of the sea. There sediment plumes extend from the land before suspended material settles out to blanket the sea floor and disrupt marine ecosystems.

Evidence for the degradation of the land resource may be seen in aerial photographs. While bared soil may not register directly as "fertile" or "nutrient-depleted," visible diminishment of vegetative cover can be interpreted as both effect—degraded scrub tolerant of reduced fertility, and cause—as one can infer expected rates of soil loss resulting from lack of cover. Soil displaced—alluvial sediment—can also be documented graphically by images showing increases in deltaic deposition, sediment plumes, and other signatures of increased turbidity.

LAND AS SPACE

One might lose sight of how small Haiti is in total areal extent, and what an even smaller portion of that area is anything akin to "prime farmland." A larger country, spanning a continent, is more likely to be blessed with multiple physical regions, separated by distance and natural barriers. In times of natural catastrophe some of these
regions would be spared and may very well have a surplus of food and resources to shift towards the affected parts of the country. A tinier state such as Haiti claims no such advantages, and a drought afflicting Port-au-Prince will likely also be felt in Cap-Haitien and perhaps Les Cayes as well.

A smaller country such as Haiti has no outlet of frontier lands for receiving surplus population increments. While the U.S. frontier was pronounced "closed" just before the beginning of the 20th century, even four or five decades later, dust bowl emigrants could make their way to the promised land of California. Later still the U.S.A. retained an industrial frontier from Chicago to Pittsburgh, where many a native of eroded, impoverished Appalachia was able to make a new start.

LAND WITH A VERTICAL DIMENSION

The overwhelming feature of the physical geography of Haiti is relief and topography, specifically rough, sloping topography. This includes ridges rising to elevations of over 2000 meters, elevated basins, fault bluffs, gorges, and lower hills. The entire island of Hispaniola has been likened to a wadded piece of paper (James 1969: 258-9), and the Haitian one third of the island is less blessed with plains than is the Dominican portion.
Pirovano (1973: 95-6) said less than 20% of Haiti is plains, and his figures indicate that over 60% of the land has slopes of at least 20%. In 1986, picturesque but precariously cultivated gardens dramatically perched upon slopes of at least 45 degrees (100% slopes) could be seen in the basalt area of Furcy, about 20 km south of Port-au-Prince. Those same vistas had made an impression upon Street (1960: 224). Cultivated slopes of a similar steepness were noted in the Northwest just inland of Port-de-Paix (see photo, fig.11). Wood (1963: 96 ff. plate 15) wrote of cropped but ungullied slopes of over 70%, almost 32 degrees, in Northern Haiti in soils derived from basalt.

What is the significance of these numerical measures of steepness? Steepness of slope, quantified, gives one of the essential factors of the Universal Soil Loss Equation, (USLE) used for calculating expected rates of soil loss (Jent, et al., 1967; Witinok 1988). One can place them in the context of recommended limits to cultivation in other parts of the world. The Food and Agricultural Organization of the United Nations, the FAO, devised guidelines for hilly lands management in the wet tropics. They recommend terracing for any slopes of 12% or more, perennial tree crops on slopes over 36%, and denser canopied forest for any hillsides of 65% or more (Hudson 1983: 450). In Southern Appalachia, conservation measures are advised at 2% slopes and cessation of cultivation recommended at 20% (Jent, et
In the Dominican Republic, "agroforestry" is encouraged on hillsides steeper than 50% (Southgate, et al., 1984: 884).

However, Zimmerman (1986: 262) pointed out that steepness of slope in Haitian land use is not variable but a "given" in the sense that Haitians have no choice but to cultivate this land. He contrasted this with something that can be changed with management, length of slope.

Length of slope is closely associated with gradient or steepness in the USLE, with the two often combined as an "LS" factor. Longer slopes give a longer uninterrupted surface for runoff water to gather momentum. Breaking the flow and velocity of water running over the surface lessens its "competency" or ability to transport sediment. Limiting extent of bare soil or open row crops to relatively smaller patches, and use of contour ridges, terraces, and arranging transverse bands of vegetative cover all serve to interrupt and slow the flow of runoff. Here one finds advantages to the microscale of peasant cultivation. On the cultivated steepest slopes of Haitian hills, the author saw plots that measured as little as 8 to 10 meters along the slope, and were bordered on top and bottom edges by hedges of candelarbre (mottle spurge, Euphorbia lactea), by banana plants, vetiver grass and castor. These arrangements constitute effective simple practices that reduce runoff and lessen soil erosion (see fig. 11).
Fig. 11. A polyculture jadin perched on a steep hillside—at least 45 degrees—just inland from Port-de-Paix in the Northwest. Notice the little woven stake-and-withe silt trap fences, less than one foot high.
Another factor in the USLE equation is the soil erodibility characteristic, largely a function of texture or fineness of particle size, which is in turn a product of parent material type. Differences in soil grain size and composition have bearing on 1) ease of water infiltration into the soil versus erosive runoff across its surface, and 2) likelihood of sediment to be detached and transported away. A striking example of these differences can be viewed upon the heights above and to the south of Port-au-Prince. Moving upslope southwards from Kenscoff, one crosses internally-drained limestone country with red clay soils (ultisols). Crossing the ridge crest at Obléon, the lithology dramatically changes to basaltic parent material, that quickly weathers into medium textured loams of low acidity and abundantly available base-forming ions of magnesium, sodium, and potassium.

The corresponding landscapes are startling. Where bare rock and sterile subsoils nearer Port-au-Prince prompted gloom and doom sensationalism from vehicle-bound reporters,

7If lime is used to make acid soils more basic, or raise pH, then why do limestone (largely calcium carbonate, CaCO3) soils in the wet tropics not weather into basic soils? 1) Soil pH is raised much more dramatically by finely crushed lime than by limestone of a larger particle size or massive limestone in situ. 2) Freed Calcium ions (Ca++) that would otherwise be base-forming are easily leached away and removed from the vicinity of parent limestone in the wet tropics. 3) The carbonate component of limestone combines with water to form an acid, carbonic acid, H2CO3, and 4) Weathered limestone leaves behind its impurities: oxides, hydroxides, and silicates of iron and aluminum, and aluminum is one of the acid-forming cations.
merely crossing the ridge a bit farther up reveals breathtaking verdant gardens perched on 100% slopes with little bare soil to be seen anywhere. This contrast in soil usability is noted on the OAS (1972) soil/land use map by difference in labelling the former region "impropre à l'agriculture," or type VII, and the latter somewhat better, "sol de cultures limitées," or type IV.

A fourth factor in soil loss is intensity of precipitation, and Haiti bears no good fortune there (see photo, fig.12). The data record is sketchy, but rain comes down in torrents or "showery downbursts" in the Greater Antilles, as much of it is associated with convectional thunderstorms—and even hurricanes—rather than gently-raining frontal activity. Just east of Haiti in Puerto Rico, 30 inches of rainfall have been recorded in 24 hours, and Jamaica to the west has experienced 8 inches in 15 minutes (Granger 1985: 24-7; Critchfield 1974: 65-6). In Northern Haiti, Wood (1963: 150) noted rainfall intensities of 15 inches in 24 hours at Limbé and Cap Haitien. Are these examples pertinent to "dry" Northwest Haiti? They give insight as surrogate measures that suggest intensity of rainfall events during relatively wetter periods. Although the mean yearly rainfall of Jean-Rabel in the far Northwest measures only 942 mm or 37 inches, one June it recorded
Fig. 12. When an upland watershed is deforested and the regrowth is given over to goats, "permanent" concrete fence posts may quickly become rather impermanent.
Most of the above factors are rather moot if sufficient soil protection is provided by a fifth factor, vegetative cover. With Haiti's tropical potential for year-round plant growth, farmers could keep their plots under green cover virtually all of the time, depending upon moisture availability. However, lacking chemical fertilizer inputs, they traditionally abandoned old fields, leaving them in brush fallow—en jachère—and then cleared and burned new ground (boucan) in a form of swidden rotation termed bois neuf or new forest. Often hardy persisting and re-sprouting crop plants would linger after harvest to maintain a protective mantle over the soil surface—notable examples include viny plants such as passion-flower and mirliton/chayote (see table 1).

Serious land use transformations have taken place in association with the burgeoning population of the last three decades. Specifically, swidden fallow periods have been much reduced or even eliminated, resulting in exhausted soil

---

Traditional Haitian culture finds explanations for unusually rainy seasons as well as for droughts. In 1986 after a much wetter spring than that of previous years, Haitians explained this turn of fortune as resulting from the newly completed translation of the entire Bible into Creole. Wilentz (1989: 164) related that droughts are explained by the anger of Damballah, the serpent god, and his walking on the sea but not the land. In the lore of French Louisiana, periodic years of wet April/May/Junes are attributed to the "St. Médard" phenomenon.
Table 1. — Vinya crops of the conuco

<table>
<thead>
<tr>
<th>A. LEGUMES:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. COMMON BEAN</td>
<td>Phaseolus vulgaris</td>
</tr>
<tr>
<td>2. LIMA BEAN</td>
<td>Phaseolus lunatus</td>
</tr>
<tr>
<td>3. COWPEA</td>
<td>Vigna sinensis or V. unguiculata</td>
</tr>
<tr>
<td>4. PEANUT, RUNNER</td>
<td>Arachis hypogaea</td>
</tr>
<tr>
<td>5. YAM BEAN</td>
<td>Pachyrizus erosus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. NON-LEGUMES:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6. YAM</td>
<td>Dioscorea sp.</td>
</tr>
<tr>
<td>7. SWEET POTATO</td>
<td>Ipomoea batatas</td>
</tr>
<tr>
<td>8. MIRLITON</td>
<td>Sechium edule</td>
</tr>
<tr>
<td>9. PASSION FRUIT</td>
<td>Passiflora quadrangularis</td>
</tr>
<tr>
<td>10. PUMPKIN</td>
<td>Cucurbita moschata</td>
</tr>
<tr>
<td>11. WATERMELON</td>
<td>Citrullus vulgaris</td>
</tr>
</tbody>
</table>

Source: Author
fertility, reduced protective plant cover, less organic litter at the surface and lost topsoil. In the degraded state of bioproductivity, the economic medium of goats are left to eat the scrub growth of brush. Lastly, with declining returns from cultivation, the need for additional income becomes more critical. Fuel-hungry urban charcoal burners back up their demand with cash, and the rural impoverished scramble to fill the supply. They most thoroughly cut dense-wooded, hotter burning leguminous trees, relatively slow in their growth, rather than faster growing but pithier species that give off less heat.

Mounting population pressures give the impetus for both tighter land use planning regimentation in the immediate future as a conserving measure, as well as direct efforts to salvage degraded landscapes. Land can be reclaimed, given time. It has been done many times in human history. Ewel (1977) examined land reclamation prospects for Haiti, and pointed out 1) the necessity of land use planning based on natural regions of watersheds or drainage basins, and 2) the importance of starting at the top of the watershed for revegetation and stabilization of soil erosion, versus bottom-first efforts that would be overwhelmed by heavy run-off and sediment from unreclaimed land above.
HOPE FOR THE LAND RESOURCE OF HAITI

Many writers have depicted the Haitian rural landscape as thoroughly degraded, implying that farming there may be no longer viable (Weaver 1979: 2; Ahmad 1977: 247; Ewel 1977: 1). Is there hope for the land resource of Haiti? There remain a few trump cards in Haiti's hand of resources, as suggested by the following items.

1) Substantial potential remains in one of the most favorable agricultural region of Haiti, the Artibonite Delta. There, production could be intensified in terms of total food output. However, this route to relieving the pressure on cultivated hillsides impinges on critical socio-political questions of who controls access to this prime land and who gets a share of its profits and produce.

2) Substantial potential remains even in Haiti's upland areas of relatively "good" soil (i.e. mineral-rich, and of medium texture and structure) and regolith. These areas include basalt/andesite lithologic zones scattered around the country, and volcanic ash zones such as the Plaisance Basin in the North. In contrast with temperate lands of higher latitudes, Haiti's wetter tropical climate with greater intensities of meteorological forces and accelerated rates of chemical reactions, leads to correspondingly rapid weathering and transformation of regolith into soil.

3) The landscape presently deforested can be revegetated. While trees in the aggregate play a critical
role in cycling and reservoiring mineral nutrients, other faster-growing plant growth forms may be at least as useful as trees in soil building, particularly leguminous forbs. In agriculture of temperate latitudes, forage legumes such as lespedeza, hairy vetch, sweet clover, and even cowpeas, peanuts, and kudzu flourish in conditions of low fertility, high acidity, or eroded clayey ultisols. These plants improve soils by contributing organic matter and nitrogen into the soil, as well as protecting the soil surface with a lush ground cover. There are tropical cultivars of some of the above plants, as well as entirely different legumes that originated in the tropics."

Tropical forage legumes for soil management have been evaluated for suitability for Haiti by the research staff of the agricultural institute, the FAMV (Felix, et al, 1982: 18-20). Species of Calopogonium, Aeschynomene, and Centrosema appeared to offer most promise for Haitian conditions, although many other forages could be tested in Haiti as well (see table 2). The FAMV report, written by technical agronomists, offered only limited suggestions as to how these plant materials might be incorporated into

"The rich diversity of wild legumes that appeared as weeds on abandoned maize plots (milpa) in tropical Mexico, was regarded with wonder by geographer Carl Sauer, as he wrote to a colleague Willits in 1945 (West 1979: 119-20). Sauer expressed regret that appropriate domesticated legumes did not seem to have been developed for use as cover crops in the plow cultivation that was then replacing the traditional hoe-cultivated milpas."
<table>
<thead>
<tr>
<th>LATIN NAME</th>
<th>COMMON NAME</th>
<th>ATTRIBUTES (key below)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aeschynomene americana</em></td>
<td>American jointvetch</td>
<td>AT</td>
</tr>
<tr>
<td><em>Alfalfa vespertina</em></td>
<td>Alyceclover</td>
<td>CSV</td>
</tr>
<tr>
<td><em>Arachis hypogaea</em></td>
<td>peanut, groundnut</td>
<td>CSV</td>
</tr>
<tr>
<td><em>Calopogonium mucupinoides</em></td>
<td>partridge pea</td>
<td>LF</td>
</tr>
<tr>
<td><em>Cassia fasciculata</em></td>
<td>centro</td>
<td>CSV</td>
</tr>
<tr>
<td><em>Centrosema sp.</em></td>
<td>guar</td>
<td>ST, DT, PR</td>
</tr>
<tr>
<td><em>Crotalaria poeruloides</em></td>
<td>Kalsi clover</td>
<td>AT, PR</td>
</tr>
<tr>
<td><em>Desmodium canum</em></td>
<td>Florida beggarweed</td>
<td>AT, PR</td>
</tr>
<tr>
<td><em>D. nuturum</em></td>
<td>silverleaf desmodium</td>
<td>CSV</td>
</tr>
<tr>
<td><em>D. cineraria/intertum</em></td>
<td>hairy indigo</td>
<td>PR</td>
</tr>
<tr>
<td><em>Indigofera hircina</em></td>
<td>striate lespedea</td>
<td>LF, AT, PR</td>
</tr>
<tr>
<td><em>Lespedeza striata</em></td>
<td>sericea lespedea</td>
<td>LF, AT, PR</td>
</tr>
<tr>
<td><em>Macrotyloma uniflorum</em></td>
<td>phasey bean</td>
<td>CSV, AT</td>
</tr>
<tr>
<td><em>Medicago sativa</em></td>
<td>alfalfa</td>
<td>P, DT, PR</td>
</tr>
<tr>
<td><em>M. alba</em></td>
<td>sweetclover</td>
<td>P, DT, PR</td>
</tr>
<tr>
<td><em>Phascolus acutifolius</em></td>
<td>tepary bean</td>
<td>DT</td>
</tr>
<tr>
<td><em>P. latifolius</em></td>
<td>siratro</td>
<td>P</td>
</tr>
<tr>
<td><em>P. aureus</em></td>
<td>mung bean</td>
<td>DT</td>
</tr>
<tr>
<td><em>Pueraria phaseolioides</em></td>
<td>tropical kudzu</td>
<td>P, CSV, LF, AT, DT</td>
</tr>
<tr>
<td><em>Sesbania macrocarpa</em></td>
<td>sesbania, tall indigo</td>
<td>ST</td>
</tr>
<tr>
<td><em>Stylosanthes humilis</em></td>
<td>Townsville stylo</td>
<td>ST</td>
</tr>
<tr>
<td><em>Trifolium alexandrinum</em></td>
<td>Beresea clover</td>
<td>ST</td>
</tr>
<tr>
<td><em>T. subtetramera</em></td>
<td>subterranean clover</td>
<td>SRA, AT</td>
</tr>
<tr>
<td><em>Vicia articulata</em></td>
<td>Monantha vetch</td>
<td>CSV</td>
</tr>
<tr>
<td><em>V. hortensis</em></td>
<td>purple vetch</td>
<td>CSV</td>
</tr>
<tr>
<td><em>V. faba</em></td>
<td>horse bean</td>
<td>CSV</td>
</tr>
<tr>
<td><em>V. sororia</em></td>
<td>Bard vetch</td>
<td>CSV</td>
</tr>
<tr>
<td><em>V. sativa, v. &quot;Nova&quot;</em></td>
<td>cowpea</td>
<td>CSV, LF, AT</td>
</tr>
</tbody>
</table>

**Attribute key:**
- AT: tolerant of acid soil
- CSV: creeping/spreading/viney growth habit
- DT: drought tolerant
- LF: tolerant of low fertility
- P: perennial, or biennial in case of sweetclover
- PR: notably pest resistant, especially to nematodes
- SRA: self-seeding annual
- ST: tolerant of soil salinity

existing farm practices: perhaps in the fallow rotations, perhaps in intercropped gardens (cultures de compagnonnage) (see photo, fig.13).

Grasses are also forages of conservation value, not contributing nitrogen to soil in the manner of the legumes, but often establishing a vegetative cover after seeding more rapidly than legumes — as much as two months sooner (Goodland, et al. 1984: 219). Grasses improve the ratio of infiltration versus runoff, send roots deep into lower soil horizons to decay into beneficial organic matter, and give a harvest of forage or thatch. Wood (1963: 99) wrote of a long peasant tradition of utilization of guinea grass, Panicum maximum on steepest slopes in northern Haiti. In 1986, a dense matted blanket of an introduced tropical carpet grass, Axonopus compressus, was observed to be covering mountain slopes, cascading over a vertical road cut in the highlands of the Massif de la Selle. In that same vicinity above Kenscoff, Street (1960: 336) noted vetiver grass, Anatherum zizanioides, planted on the contour for soil conservation, and prized for its yield of essential oil and for thatching. Other grasses such as the creeping, hot weather-loving Saint augustinegrass, Stenotaphrum secundatum, are recognized as having a moderate degree of shade tolerance, and are under research for feasibility in agroforestry combinations with trees.
Fig. 13. Maize intercropped with a legume, peanuts, at an elevation of about 1000 meters, near crest of Morne Haut Piton. Note young maize seedlings three or four stems per planted hole, and the extent of ground coverage afforded by the viny runner-type peanuts.
Agroforestry confronts the question of how the peasant, on the margin of economic survival, can find enough space for trees for fuelwood or timber, or for soil-restoring legumes, or even for traditional fallow (Weaver 1979: 2; Zimmermann 1966; Higgitt 1992: 231). The proposed answer recognizes that immediate food needs must be supplied by some of the usual crops even as tree seedlings for the long-term are interplanted among them. Later, short-run cash crops (coffee) and other food crop plants that are shade-tolerant (yams), will keep giving an economic return even as fuelwood trees and still longer-term maturing timber trees loom above them. The foundation for agroforestry systems is already in place in Haiti with the cultivation of coffee and cacao and their over-shading "nurse" trees, an effective arrangement for soil conservation when oriented in rows along the slope contour (Lugo, et al, 1980: 156). There is a multi-story food cropping precedent in the polyculture conuco gardens of Haiti, where castor, maize, manioc, and papaya plants sway above lower-growing beans and sweet potatoes (Zimmermann 1986: 261).

Zimmerman (1986: 263-4) argued for alley cropping, where faster-growing leguminous trees are planted in rows across the contour, with seasonal food crops intercropped in the lanes or alleys in between (see photo, figure 14). At the beginning of the annual crop growing season, the trees
Fig. 14. Looking southwestwards from Port-de-Paix vicinity: hedges and crops planted along the contour aid in soil conservation. Although this area experiences lengthy dry seasons, when the rains come they are frequently earth-moving deluges. The hedges here are likely to be candélabre, (Euphorbia lactea), or castor (Ricinus communis), both rugged "survivors" with some economic value as well. Note the manioc in the foreground.
are radically pruned for fodder, allowing more sun to reach the food crops.

Despite continuing advances in agronomic research, restraint and caution should be advised against expectations of a technological finessing out of this dilemma. No matter what legumes and pioneer trees exist for land reclamation, if the actual "land managers" described by Blaikie and Brookfield (1987: xvii) do not trust agricultural extension and development advisors, or simply cannot afford to take a risk on something chancy or of slow economic return, then the land reclamation cannot and will not take place. The agricultural engineer N.W.Hudson (1983: 447) found "nontechnical" constraints to soil conservation in the Third World—"political, social and economic"—as "equally formidable" as physical problems. Higgett (1992: 232,234) stated the same conclusion still more emphatically in his review of recent works on geography and soil conservation.

Ultimately, an understanding of land use must be thoroughly grounded in the science of physical processes, but cannot be complete without an accounting for patterns of human social behavior, or "culture." From Goodland, et al., (1984: 7) a poignant proverb is passed along carrying the wisdom of Chinese philosophers:

If you plan for one year, plant rice.
If you plan for ten years, plant trees.
If you plan for 100 years, educate mankind.
Land Tenure: The Rules of the Game

Why care about land tenure? It has great impact upon the look of the land as crop choices depend upon length of tenure. Land tenure and proposed land reforms figure prominently in the current events of Haiti today.

In this study of rural poverty and underproduction, it is apparent that uncertainty of land tenure compromises at least two of the basic factors of economic production, land and capital. (1) Insecurity of land use privileges threatens the continued productivity of the land resource itself. When lacking assurance of continued access to a given piece of ground, peasants are unlikely to justify investment there of time or money into projects of long-term payback. Those projects might include most soil conservation measures; building structures for irrigation or terracing; or planting perennial vegetation in the form of fruit trees, fuelwood trees, or coffee trees. (2) Lack of clear title, despite practical reasons for the unclarity, seriously compromises the value of the land as collateral for loans. (3) Usurious land tenure arrangements can squeeze return to the cultivator and divert away what might have been rural-based seed capital for buying land, paying for schooling, or energizing credit cooperatives. Staring at this cash vacuum, the peasant farmer remains locked in a cycle of poverty and indebtedness. What are the prevailing land tenure arrangements in Haiti?
THE PERMUTATIONS OF TENURE

While peasant farmers often operate at a micro-scale, they may own with clear title (or "hold in fee") at least a part of the land that they work. The cultivator may squat on vacant land, although Haiti is a small country and word can filter back to an absentee owner, who would not likely forego rent regarded as rightfully due. More usual is an arrangement of rental, subrental, or share-cropping, and there are many possible variations and combinations of these relationships.

In approximating a typology of land tenure arrangements in Haiti, pairs of contrasting, dichotomous variables emerge. Obvious contrasts include:

1. short-term versus long-term usufruct or use rights to the land
2. rent paid in cash versus paid in a share of the produce
3. amount of rent determined in advance at time of contract initiation versus a post-harvest accounting
4. whether the landowner is a private individual or the state
5. whether the farmer contracts directly with the owner or through the intermediary of a sub-lettor.

__ Possible conditions promoting squatting might include proximity of insufficiently attended government land, presence of abandoned private land with little remaining perceived worth, or the vulnerability of fallow land of someone whom the community views as suffering from an excess of "ambition" (Underwood 1964: 481; Palmer 1976: 190).
Outside of this framework of variables there fall additional modes of tenure: the farm manager who is paid a wage, squatters, and of course owner-operators. These various modes are summarized in table 3.

**UNCLEAR TITLES, PRACTICAL REASONS**

Land tenure gets still more complicated by the fragmentation of inheritance, or more precisely, the forestalling of the formalization of a divided inheritance. Street (1960: 448) said that this practice, along with lack of cadastral survey and squatting on government land results in lack of clear title. The issue of people working land of questionable ownership might be unthinkable to members of another society, but the Haitian peasant may have good reasons for leaving it this way. Substantial legal fees are incurred in formally registering any land transfer. The new owner will be liable for a tax on a land transaction. The buyer may run into considerable expense in legal suits defending his or her claim against contesting claimants, or in paying settlements to them. (Underwood 1964: 476; Zuvekas 1978: 20).

For example, if an absentee uncle lets his nephew continue to crop his half of contiguous plots, ceded by the deceased patriarch, could the nephew later try to claim possession by years of occupation and use? Would favors and
Table 3. — Haitian land tenure

<table>
<thead>
<tr>
<th>LAND TENURE ARRANGEMENT</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OWNER OCCUPANCE</td>
<td>As of the early 1970s Haiti differed from many Latin American countries in that a majority of the farmers -- probably at least 60%, and in many area studies 75 - 90% -- owned land. Two caveats here: 1. survey replies may be distorted by the tremendous importance placed by rural Haitians upon owning land, abhorring landlessness, and associating that with one of their worst epithets, a &quot;vakabon.&quot; 2. The land &quot;owned&quot; by one farmer may well also be claimed by others.</td>
</tr>
<tr>
<td>(faire-valoir direct)</td>
<td></td>
</tr>
<tr>
<td>2. RENTER FROM STATE</td>
<td>-- Fecho in 1984 asserted that state land was plentiful on the Plain du Nord and available for rental to young beginning farmers at low cash prices.</td>
</tr>
<tr>
<td>(fermage de l'état)</td>
<td>-- Sizeable tracts of good level lowlands owned by state -- Plain du Nord, Trois Rivieres Valley -- are likely to be tied up by large commercial interests.</td>
</tr>
<tr>
<td>3. RENTER FROM PRIVATE</td>
<td>-- State land, without resident supervisor, may lend itself to subleasing with greater potential for abuses, or to squatting.</td>
</tr>
<tr>
<td>(fermage en espèce)</td>
<td></td>
</tr>
<tr>
<td>4. LEASE</td>
<td>distinction between &quot;rent&quot; and &quot;lease&quot; somewhat artificial here, as minimum length of contract period stipulated by law. Minimum varies by type of crop, with 3 yrs stipulated for annual food crops if contract unwritten; if written, one year deal available.</td>
</tr>
<tr>
<td>(potek, cédé à bail)</td>
<td></td>
</tr>
<tr>
<td>5. MANAGER</td>
<td>Underwood (p.477) indicated that in at least some vicinities, sharecropping is last resort of poorest cultivators who can't raise the cash for some other rental arrangement.</td>
</tr>
<tr>
<td>(gérant)</td>
<td>Underwood, Murray, and Zuvekas all pointed out that de moiïte, or going halvers, is not a strict commitment to giving up exactly half of harvest, with cultivator likely to be able to keep more.</td>
</tr>
<tr>
<td>6. SHARECROPPER</td>
<td>subleasing probably underreported in the literature; possible means of circumventing measures on the law books designed to protect the farmer, such as the minimum rental contract duration.</td>
</tr>
<tr>
<td>(de moiïte, métayage)</td>
<td></td>
</tr>
<tr>
<td>7. SUBLEASE</td>
<td></td>
</tr>
<tr>
<td>(sous-location)</td>
<td></td>
</tr>
<tr>
<td>8. SQUAT</td>
<td>on government land, on marginal abandoned, act of protest against &quot;overly ambitious.&quot;</td>
</tr>
</tbody>
</table>
services rendered to the uncle—perhaps taking in the uncle's child—constitute rent paid for land use privileges?

Some intuitive "truths" bear closer inspection as well. Perpetual cycles of debt are often characterized as oppressive, usurious, not unlike slavery, and altogether evil. However Raper and Reid (1941: 37), writing on cotton tenancy in the American Deep South of the 1930s, put an alternative cast upon debtor/creditor sociology. In general, they decried the exploitative relationship that kept share-croppers on a treadmill of debt to big landowners who advanced on credit both family provisions and crop inputs of seed, feed, and fertilizer. However the authors poignantly noted that creditors took care of their debtors in the interest of recovering their capital and avoiding the forfeiture of their own leveraged estates. This patronage took various forms as the landed elite traded upon their local family influence with law enforcement bodies, courts, and clergy.

In the American South of the depression era, Whites of the lowest socio-economic class had negligible standing in the community and easily risked injury or death if they dared to cross the local power brokers. Yet, can these curtailments of human rights come close to those of Haiti, with its long history of concentrated and intertwined political and economic power? The political component has simmered into increasing volatility in recent years as economic well-being has deteriorated and nurtured a cohort
of desperate men and women. In Haiti one would search in vain for the juridical refuge of a long-revered and genuinely potent national constitution, or for the support of federal marshalls, or indeed for any real checks and balances to the tyranny of collusion between the local chef de section, a petty despot, and the gwo neg, or economic power broker. Simple survival for oneself and family meant choking back the bitter bile of socio-economic realities, because, after all, as Haitian lore instructs us ...

Ravet pa jam ge rezo deva poul

(A cockroach is never in the right when it is up against a hen)
(McConnell and Swan 1952: 104)

If that is not explicit enough ...

Ti neg fe sa-l kapab;
Gro neg fe sa-l vle

(The little fellow does what he can;
The big fellow does what he wants)
(McConnell and Swan 1952: 108)

Postulated here are analogies with the American South, but is there empirical evidence of Haitian analogues? First Mintz (1961), then Murray and Alvarez (1975), have written of the simplest manifestation of such reciprocal economic relationships, in describing pratik alliances between buyers and sellers in the marketplace. There, one chooses to habitually patronize the same vendor, and in return for this loyalty and good will, one begins to earn favored bestowals
of choice produce, perhaps even discounts, or other perquisites. Bear in mind that there are multiple ranks of commercants, and with higher stature comes a greater likelihood of diversification into other enterprises. A dry-goods retailer is likely to also lend money, and is likely to buy coffee, either with official sanction, or en tapinois (on the sly). The entrepreneurial merchant may also speculate in locally-produced foodstuffs. To this end, agents are sent out to scour the countryside, buying grain and beans cheaply at harvest time to later have a monopoly on local supply with the reserve that is sekrète (stashed away) (Maguire 1989: 10).

Throughout this study has been the implicit or explicit suggestion that the association of modern technology and values increasingly permeates and disrupts folkways in Haiti. Yet this concept could only be applied with difficulty to human social constructs such as the land tenure system. Culture, at its edges nebulous and shifting, moves but ponderously, with great inertia and resilience. It is an aggregate human product. People cling dearly to images that they know, and cherish, and expect to endure. While culture is ever changing, these changes may well be subtle, almost imperceptible to members of a society, the present players on history's stage.

This point is raised in the context of Haitian land tenure because some land use traditions are formalized in
the legal code, but a great many of these relationships follow an unwritten design crafted by the consensus of the village community. With any trait of their culture, Haitian peasants have some concept of how things are "supposed to be." The community exerts social pressure through fomenting rumors, ostracism, boycotts, vandalism of property, and ultimately violence against people, to bring land use behavior in their community back into conformity with traditional norms. The less subtle actions may or may not be cloaked in the guise of voodoo or of legal pretenses. (Underwood 1964: 480-1; Murray 1980).

The value of the land resource in the Haitian peasant world view, is reflected in the reception given the national tree-planting campaign, Projet Pye Bwa circa 1986 and 1987. Rural folk could readily appreciate material benefits of the tree-planting campaign: green-chop fodder for goats, fuelwood, and poles. The less obvious benefits of topsoil building and soil erosion control were more difficult to appreciate. With the planting of exotic trees, entire landscapes were beginning to be transformed into something alien and nontraditional. Disgruntled murmurings became increasingly common: "The land belongs to us, but what are they doing to it?" Rumor said the trees were sucking all the vigor from the soil. "Exactly who will benefit from this, anyway?" It was not clear to rural folk how they would. "Whose idea was this?" It appeared to be imposed by
the blancs—all foreigners—and French-speaking agronomists.

"How can we grow food if all the land becomes taken up by trees?" Reportedly, entire nurseries of seedlings were uprooted (Wilentz 1990: 277).

Although Haiti had had a long history of authoritarian governments, the extremes of abuses and injustices through three decades of Duvalierism were building pressure for a reckoning or "correction." This was especially true for issues surrounding the resource that Haitian farmers hold so dear, the land. This long-awaited time of correction burst forth like an August thunderstorm in Port-au-Prince, close upon the heels of Jean-Claude Duvalier's departure in February 1986.

Déchoukage means an uprooting of old stumps, a clearing the ground of lingering encumbrances. This symbolism was extended to the settling of old scores in much of 1986 and early 1987, and many if not most of these uprisings involved land rights disputes. This writer observed déchoukage in the Northwest in the spring of 1986 and the summer of 1987. Sojourning in Jean-Rabel, a market town in the far Northwest that lacked commercial lodging, required that accommodations had to be arranged with the help of new-found acquaintances. These middle-class Haitians, returning home after a long absence, owned a vacant rental house in the middle of town that might have been let out to the author as a base for rural reconnaissance forays. However, brief inquiries
quickly showed the house to be in the taboo twilight zone of contested title. Just as if it had been haunted, we were admonished to steer clear of it, or risk the invocation of considerable ill will upon us. During the week's stay in the town, the largest land-owner in the parish had 100 banana plants chopped down in protest of his alleged usurpation and expropriation of land. The author saw an adolescent beaten nearly to death, with onlooking Haitians hesitant to intervene. This was only a small foreshadowing of the trouble that lay ahead for Jean-Rabel.

The reaction to the manifestations of peasant activists came a year later on July 23, 1987. Members of the increasingly pressured and agitated landed elite, bribed, brow-beat, or otherwise incited a following of local peasants into physical attacks upon activist peasants, cooperative members now branded as "communists." Conservative estimates reported 50 people killed, many hacked to death by machete. Soldiers were said to have participated, and available medical treatment said to have been withheld. (New York Times 7/27/87: A2; Abbott 1988: 348-9; Wilentz 1990: 140).

The initial déchoukages might be interpreted as a sorting out of land rights tangles back toward some traditional equilibrium of societal consensus. But as the pendulum swung farther—nearer the equilibrium? past it?—the continuing movement toward restructuring the
socioeconomic status quo began to drag on the friction of cultural conservatism. Meanwhile Haitian scholars were beginning to address the issue of land reform, not in the streets, but in the forum of intellectual debate (François 1988: 52-3).

In the ensuing four years after the departure of Jean-Claude Duvalier, Haitians yet again found themselves saddled with leaders pre-occupied with the consolidation of personal power and wealth, with interludes of do-nothing figureheads. Finally popular frustration burst forth with the election of populist reformer, Jean-Bertrand Aristide in December, 1990. What has this to do with land and geography? Among Aristide's very earliest proposals were land reform measures that would sell off underutilized government lands to young farmers. Most prominent were reassurances that these measures would not involve coerced expropriation of private estates (French 1990: A-18). Yet, Aristide had uttered the fatal words, "land reform," and thus touched a nerve of the minority that dominates Haitian land and capital, and who in turn pays the military with coin and privilege. The first attempted coup d'état one month into his elected term

---

11 There has been a decades-long tradition of the Haitian armed forces offering a route of upward mobility for individuals of the lower socio-economic classes, although the military leadership has always been directed from, or bought by, entrenched interests in the central seat of power (Trouillot 1990: 88; Weinstein and Segal 1984: 143).
failed to unseat him. The second one, at the nine-month mark sent him into foreign exile.

The "Typical" Farm

Haitian peasant agriculture exhibits various features that ring familiar in other cultures. From the outset the reader should be aware of terminology distinctions that are often blurred in Haiti: "subsistence" versus "commercial," and "domestic" vs. "export." One is obliged to take note of a less obvious, but important distinction: the Haitian lakou differentiated from the Haitian jadin. The concept of lakou—the "dooryard garden" is a familiar element in other parts of Middle America—but it takes on greater importance in Haitian subsistence, and is contrasted to the field crops of the jadin (Kimber 1966; Peeters 1979).

A higher relative importance of the Haitian dooryard garden might not be surprising given the most apparent distinguishing characteristic of Haitian agriculture, its very small size. The entire homestead is quite modest, from the unpretentious dwelling, the ti kay (fig. 15,16), to the areal extent of the crop patches. The Haitian farm is spatially small and getting smaller. The national survey of 1971 showed mean farm size to be 3.5 acres, with 59% of all farms less than 2.5 acres, or one hectare (2.471 acres). The median farm size was only 1.6 acres, or one half of a Haitian carreau which measures about 3.3 acres.
Fig. 15. Close-up of folk housing: a ti kai of one or two rooms, with wattle and daub walls. The choice of materials for roof thatching depends upon local availability (Street 1960: 417). Pictured here is a thatching of an unidentified palm, although guinea grass, Panicum maximum, and cow cane, Arundo donax, are also commonly used.
Fig. 16. This could be a typical peasant farmstead, though not typical of driest parts of the Northwest. This site is about 1700 m in elevation, in the hills south of Port-au-Prince. A variation depicted here is the sheet metal roof as opposed to more traditional thatching.
That point bears emphasis: essentially, half of all Haitian "farms" measure an acre and a half, or less.

Survey data indicated that in a ranking of Haitian farms by size in descending order, the top 4% of the total number of farms held 20% of the farmland, and Maguire (1979: 12-14) gave evidence indicating that that estimate was too low. Of this 20% of all farmland, about half of that, or 10% of all farmland, is estimated to be held by the few large plantations, which are mostly run by US companies, producing sugar, sisal and coffee (EIU 1991: 36). What part do the peasant producers play? With coffee the leading export commodity, accounting for 30% of Haiti's export income in 1986, only 11% of coffee "plantations" were over 6 ha (15 acres), and 65% were less than 2.6 ha (2 carreaux or 7 acres) (EIU 1988: 29; Weinstein and Segal 1984: 91).

The peasant's farm is small in terms of the various measures of "throughput"—volume of input and output in the system of production. External inputs are kept to a minimum—sweet potatoes planted from donated surplus vines, perhaps tools are borrowed, and land is "rented" on basis of crop to be shared later. A small quantity of production comes out. In the early 1980s Haitian maize yields averaged nationally about 15 bushels per acre, while the U.S. figure would be over 100 bushels per acre. A low level of income is generated, leaving a precariously narrow margin for risk. This last feature is also a factor contributing to the
inertia of a vicious cycle where the petit habitant, literally the "little" farmer, stays poor, and stays small. Desperately "treading water" in ordinary times, the head of the household finds that the economic stability of his or her family becomes increasingly vulnerable to "swamping" by the shockwaves of domestic political disruptions and of increasingly intrusive international economic forces. Moral (1961: 7) noted that this loss of innocent isolation was visible to him even during the course of his research between 1950 and 1959. In a more recent illustration, Wilentz (1990: 15-18) depicted a scene of Haitian peasants bewildered by tangible evidence of the international drug trade, literally upon their doorstep.

DIVERSITY: A LITTLE OF THIS, A LITTLE OF THAT

An important strategem in managing the peasant's narrow margin of risk presents a second major characteristic of the "typical" farm, its striking diversity of enterprises. On a given farm there may or may not be a few shrubs of the nation's main cash crop, coffee. One certainly does expect food crops of maize, lima beans, and sweet potato, with hardier reserve plantings of pigeon peas and manioc. Further, the jadin may be bordered by a few castor plants producing beans for multi-use oil. Though of slight local market value, the beans are sometimes traded, along with
dried spirals of citrus peel, tobacco, and the crude fibers or woven cordage of pite (sisal, Agave sisalana).

A significant amount of food calories are provided by incidental "gleaning" or "foraging" each day, a process termed grappillage (Moral 1961: 189). These mostly come from fruits in season—mangos, kenep (Melicocca bijuga)—and from sugar cane. The rural peasant cultivator grows food crops—pulses, starch staples, and fruits—for household consumption and to sell in urban markets. Yet non-food cash crop items are not hard to find: citrus peel drying in the sun, sisal or pite for cordage, tobacco, herbs such as du thym (thyme, Thymus vulgaris), and not least, coffee, traditionally the principal export crop of Haiti. Girault (1985: planche 14, section II.A.) reported that Haiti, as a nation, consumes much of its own coffee production, although not necessarily within the households of peasant producers themselves. This appears to be true for tobacco, as well.

The lakou provides a broader array of plants for a wide range of uses: medicinal, condiments, and flowers for both market and family pleasure (see figs. 17, 18, photos of medicinal plants). Some of the herbs loom large in the spiritual realm, especially in guarding one's threshold (Peeters 1979).

In addition there will be a few chickens—to sell a few eggs, and the birds themselves as they pass their laying
Fig. 17. The physic-nut, *Jatropha curcas*, is a good example of a medicinal herb of the *lakou*. In addition to its use as a purgative, juice squeezed from the stem is applied to wounds. Haitian tradition holds that the wounds of Christ were so dressed, hence the Creole name for the plant, *médicinier bénit*, or blessed medicine.
Fig. 18. Castor, *Ricinus communis*, called by the Haitians *palma christi*, or palms of Christ. The oil is a medicinal purgative containing the toxic alkaloid ricin. However informants report that poorer people attempt to cook with it after adding a bit of lemon juice. More commonly the Haitians use the oil for a hair dressing.
peak and winter holidays approach, or whenever cash needs are most pressing. There is likely to be two or three goats, foraging on "the commons" along roadsides or on fallow or abandoned property, and tended by a boy of grade-school age—who may never have had a chance to go to school.

A merchant woman, la marchande, sells her produce in periodic markets near her home or a far walk away. She will sell maskriti or castor beans, pigeon peas in the hull, roots by the pile, manioc starch, mangos and avocados, eggs, chickens and piglets. The mangos and avocados may well be offered for sale—when most everyone else also has mangos and avocados for sale. A man, the fabricator himself, might vend straw hats. He may make and sell charcoal for the cookstoves of Port-au-Prince. He may make a few kob or small change, betting on the gaguerre or cockfight. He may lose much more wagering at the lottery kiosks, the borlette.

SUBSISTENCE OR COMMERCIAL?

Conventional wisdom would have it that Third World farmers, living on the margin of survival, are "subsistence farmers," eating what they produce and producing what they eat, largely outside any system of monetary exchange. This ideal, however, appears to be somewhat exaggerated, perhaps romanticized, and a waning phenomenon, worldwide. Researchers in Haiti have pointed out that Haitian peasant farmers are both subsistence and commercial. Some have
stated flatly that they are "not subsistence farmers" (Weinstein and Segal 1984: 87), but it seems that the degree of commercial orientation is often underappreciated.

Are Haitian cultivators truly "peasants" or micro-scale "farmers?" Breslin (1987: 46) said the difference is significant; that peasants are subsistence-oriented, while farmers think profit. Certainly the two labels are not sharply divided. The destination of farm produce will depend in part upon seasonal changes in hunger and cash demands or debt stress.

The question of "subsistence or commercial?" was directly addressed by Anglade (1974: 91) who said the answer is largely a matter of scale of operations, i.e., farm size. Others (Moral 1961; Maguire 1989) have pointed out that most cultivators in a given area, plant, harvest and market their main food crops at about the same time. The rural family may have a post-harvest period of relatively increased participation in the cash economy, while much of the rest of the year may be more accurately characterized as subsistence or "survival."

There is also a long-term variable aspect to this question, as profitability of a given crop changes with world and domestic market conditions. This and other factors can lead to less emphasis on the cash crop and more cultivation of food crops, though the latter can also be commercially-oriented, and do not necessarily signify a
withdrawal into subsistence. Thus regions, households, and the mix of crops can gradually shift from relatively subsistence-oriented, to relatively market-oriented, as related in the coffee section, below (Murray and Alvarez 1975; Gudeman 1978).

Questions of crop selection and marketing strategies are related to categories of land tenure. Many, if not most, cultivators will claim to be "land owners." Haitian society places a premium upon that status and conversely, so abhors the landless, roving trouble-maker or vakabond, that this term is extended to general usage as a common insult. The cultivator might indeed own some bit of land, while paying rent for most of what they work, often under usurious terms.

Land tenure arrangements will no doubt influence choice of crops to be planted. There are questions of choosing quick-return annuals or risking investment in longer-term perennials if land use rights are secure enough. The cultivator may be faced with the choice of higher market value produce for pressing creditors, versus the security of hardier crops that may be less in demand at the market. More emphasis might be placed on a root crop that can be concealed from a landlord expecting a share of the harvest. Let us look more closely at some of these crops on the Haitian landscape and their place in the rural Haitian economy and culture.
CHAPTER THREE
FOUNDATIONS OF RURAL SUBSISTENCE

Staple Food Crops

The Haitian crop complex is made up of culture traits from three separate culture realms: African, AmerIndian, and Western European. Each one of these mother cultures contributed to Haiti food crop plants and associated traits: both non-material traits in methods, and material traits as implements for cultivating and processing. New World contributions included manioc, sweet potato, and yautia; avocado, papaya, chile pepper, maize, Phaseolus beans, and cucurbits; as well as the indigenous Arawak Indian mode of conuco cultivation, or mounding earth around root crops and companion plantings (fig.19). The Old World contributed the true yam, Dioscorea sp., rice, cowpeas, sorghum, mangos, and citrus fruits. The "Irish" potato is a New World plant, but apparently came to the West Indies with the Europeans, and today is associated with European tastes in urban Haiti.

Is there one predominant starchy staple food in Haiti? A World Bank (1982: 58) map shows Haiti among the "rice" countries of the world, and a large number of Haitians would tell you they eat mostly rice. It is, after all, the prestige or upscale food of much of the developing world. However, production data suggest that maize is the most
Fig. 19. Descended from the New World Arawak conuco, pictured here is one of the most common associations of crops in Northwestern Haiti. From left to right: sweet potato, maize, manioc, maize again, and a bean—probably lima.
Fig. 20. A starchy staple in natural packaging: a "belle régime" or nice stalk of plantains. A list of most savory ways to consume plantains would likely include banane pesé, or pressed fried cakes similar to North American hash-brown potatoes. At the opposite end of the taste spectrum one might place whole boiled plantains, which have been likened to "eating a wax candle."
widely grown food crop, and Paul Moral (1961) in his classic *Le Paysan Haïtien* suggested the time of most food abundance was the early summer season of avocados and mangos. In a single household one might consume plantains (see fig.20), bananas, and breadfruit, grain sorghum, maize grits, wheat bread, and rice, as well as a broad selection of root and tuber crops.

**Root and Tuber Crops: The Hidden Harvest**

The Haitian crop complex is rightly termed *polyculture*, as no one species or growth form of plant dominates. However, the special advantages of root and tuber crops are easily overlooked, obscuring the fact that as a group, roots and tubers may be of paramount importance in the crop complex. It is the contention of this observer that the importance of root and tuber crops in Haiti is much underappreciated and that they possess attributes that bear greater attention.

Root crops may well represent the very foundation of peasant subsistence in more than one sense. First, the root and tuber crops loom large by their virtual omnipresence. There may be peasant gardens in Haiti that do not include sweet potatoes, manioc, or yams, but the observations of
this writer spanning four years have yet to reveal a locality without one or more of these.\textsuperscript{12}

The three most important root crops—sweet potatoes, manioc, and yams—merit further recognition for the breadth of the environmental range that they encompass. Manioc is raised in the driest and most infertile zones, true yams are found in the cooler, moister uplands, and the many varieties of sweet potatoes appear partout—everywhere.

In tracing a commodity from agricultural production, we move beyond the marketplace and ultimately come to the dinner table. Once again, the roots and tubers are much in evidence. In traditional cuisine whole or quartered boiled sweet potatoes may be the most common dish, though plantains and beans are almost as evident.

A list of major Middle American producers of root and tuber crops reveals Haiti to be one of the largest producing nations in the region, growing these crops at a level disproportionate to the size of the nation (table 4). On a per capita basis Haiti is the biggest producer of the seven countries listed with 122 kg. per year. While consumption figures might be even more meaningful, root and tuber crops are not exported or fed to animals very often in

\textsuperscript{12}Schery (1972: 483) termed any vegetable food dug from the soil a "root crop," while pointing out that only some of these food structures are truly roots (manioc, for example), while others are tubers or modified stems (potato).
Table 4. — Roots and tubers production

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>Average production 1979 - 1988 FAO estimates in 1000 metric tons</th>
<th>1988 population in millions</th>
<th>Root and tuber production, kilograms per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MEXICO</td>
<td>1100</td>
<td>84.9</td>
<td>13</td>
</tr>
<tr>
<td>2. CUBA</td>
<td>1000</td>
<td>10.1</td>
<td>99</td>
</tr>
<tr>
<td>3. HAITI</td>
<td>770</td>
<td>6.3</td>
<td>122</td>
</tr>
<tr>
<td>4. JAMAICA</td>
<td>250</td>
<td>2.4</td>
<td>104</td>
</tr>
<tr>
<td>5. DOMINICAN REPUBLIC</td>
<td>210</td>
<td>6.9</td>
<td>30</td>
</tr>
<tr>
<td>6. PUERTO RICO</td>
<td>31</td>
<td>3.6</td>
<td>9</td>
</tr>
<tr>
<td>7. TRINIDAD</td>
<td>11</td>
<td>1.2</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: FAO (1989)
this part of the world, and production figures are probably not far off as surrogates for consumption.

One can note that Haiti produces about 70% as much root and tuber crops as Mexico, with only about 7% of Mexico's population. Haiti raises almost twice as much roots and tubers as cereal, while the Dominican Republic which shares the island of Hispaniola with Haiti, raises only 40% as much roots as it does cereals.

Table 5 lists eleven root and tuber crops present in Haiti. The diversity suggested here reflects both the range of micro-environments found in Haiti as well as the number of culture realms from whence these crops diffused. The eleven plants have been ranked here in three tiers of importance.

The top triad of sweet potatoes, manioc, and yams are raised in greatest abundance, and in sum account for about 600,000 metric tons of Haiti's 770,000 total roots and tubers. Sweet potato, manioc, and yam are produced in Haiti in an approximate ratio of 3–2–1 (FAO 1987: 139–43).

In the second tier of moderate importance is the potato, *Solanum tuberosum*. Consumption of the potato in Haiti is limited to a relatively small middle-class urban market. However, in the developing world overall, the consumption, yield, total output, and planted area of potatoes, have increased appreciably in the last two decades (Horton 1987: 13–19).
<table>
<thead>
<tr>
<th>Genus</th>
<th>Species</th>
<th>English name</th>
<th>Haitian name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipomoea</td>
<td>batatas</td>
<td>sweet potato</td>
<td>patate</td>
</tr>
<tr>
<td>Manihot</td>
<td>esculenta</td>
<td>manioc</td>
<td>manioc</td>
</tr>
<tr>
<td>Dioscorea</td>
<td>bulbifera cayennensis</td>
<td>yam</td>
<td>igname</td>
</tr>
<tr>
<td></td>
<td>pilosuiscula</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>polygonoides trifida</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solanum</td>
<td>tuberosum</td>
<td>Irish potato</td>
<td>pom tè</td>
</tr>
<tr>
<td>Colocasia</td>
<td>esculenta</td>
<td>taro</td>
<td>malanga</td>
</tr>
<tr>
<td>Xanthosoma</td>
<td>jaquinii sagittifolium</td>
<td>yautia, cocoyam</td>
<td>malanga, tayo</td>
</tr>
<tr>
<td></td>
<td>violaceum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arracacia</td>
<td>xanthorrhiza</td>
<td>arracachia</td>
<td>panème, afio</td>
</tr>
<tr>
<td>Calathea</td>
<td>allouia</td>
<td>---</td>
<td>topinambour</td>
</tr>
<tr>
<td>Helianthus</td>
<td>tuberosus</td>
<td>sunchoke</td>
<td>topinambour</td>
</tr>
<tr>
<td>Maranta</td>
<td>arundinacea</td>
<td>arrowroot</td>
<td>arouroute</td>
</tr>
<tr>
<td>Pachyrrhizus</td>
<td>erosus</td>
<td>yam bean, jicama</td>
<td>pois manioc</td>
</tr>
</tbody>
</table>

Source: Author, compiled from Pierre-Noel (1971)
Roots and tubers command a special place in Haitian folklore, as well. In a pre-literate peasant society, the conventional wisdom of folk proverbs is often illustrated with material objects of everyday familiarity. Not surprisingly, root and tuber crops appear in the following traditional sayings:

Nan temp grangou patat pa ge po
(In times of hunger a sweet potato has no peel)

Se kouto sel ki kone sa ki nan ke yam
(Only the knife knows what's in the heart of the yam)

A further insight into the special fondness bestowed by the peasant farmer on his plant and animal materials—his very means of survival—is revealed in sweet potato variety names of table 6: Ti Charles (little Charles), Mon Ti Fier (my little pride), and Domi Kolé (snuggle up close).

SWEET POTATO

Of the Haitian root and tuber crops, the single most important one is the sweet potato, Ipomoea batatas. This is the leading root crop in the country by level of production, with 380 metric tons, to only 290 and 135 for manioc and yams respectively (FAO 1987: 139-43). In addition, the sweet potato boasts the broadest environmental range and is virtually omnipresent. It spans all of the climatic zones from dry to wet climate, and from low to high elevation.
Table 6. —Sweet potato and yam variety names in Haiti

<table>
<thead>
<tr>
<th>SWEET POTATO (Ipomoea batatas)</th>
<th>leaf shape</th>
<th>skin color</th>
<th>flesh color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domi Kolé</td>
<td>digitate</td>
<td>reddish</td>
<td>white</td>
</tr>
<tr>
<td>Mon Ti Fier</td>
<td>digitate</td>
<td>yellowish</td>
<td>white</td>
</tr>
<tr>
<td>Ti Savien</td>
<td>cordate</td>
<td></td>
<td>white</td>
</tr>
<tr>
<td>Bambou Salnave</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dacoune</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regardeffe</td>
<td></td>
<td>pinkish</td>
<td>white</td>
</tr>
<tr>
<td>Ti Pomé</td>
<td>digitate</td>
<td></td>
<td>white</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>YAM (Dioscorea sp.)</th>
<th>conjectured species</th>
<th>leaf shape</th>
<th>color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinée</td>
<td>cayennensis?</td>
<td>elongated</td>
<td>yellow or white</td>
</tr>
<tr>
<td>Seguin</td>
<td>alata?</td>
<td>rounded</td>
<td>white</td>
</tr>
<tr>
<td>Zumaique</td>
<td>cayennensis?</td>
<td></td>
<td>white</td>
</tr>
<tr>
<td>Susu</td>
<td>alata?</td>
<td></td>
<td>(large) reddish/ violet white</td>
</tr>
<tr>
<td>Rialle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fran</td>
<td>polygonoides</td>
<td></td>
<td>white</td>
</tr>
<tr>
<td>Chat</td>
<td></td>
<td></td>
<td>white with red skin</td>
</tr>
<tr>
<td>Batiste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martinique</td>
<td>trifida</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masoco</td>
<td>bulbifera</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author.
It is important for both household subsistence consumption and for marketing for cash.

Yet, locational puzzles sometimes appear — not so much in regards to absolute presence or absence of the crop, but in relative degree of emphasis. For example, the sweet potato was much in evidence in plots surrounding the northwestern city of Port-de-Paix, but peasant informants discounted this and stressed that Tortue, the island just offshore from Port-de-Paix, was "the sweet potato place."

A truly remarkable plant in terms of versatility, the sweet potato affords more calories than the Irish potato and is rich in vitamin A, calcium, and iron. The prolific growth of vines and foliage makes a nutritious and palatable forage for livestock. Younger, more tender leaves can be cooked and eaten by humans as a potherb relatively high in protein, although the Haitians apparently do not do so.

The sweet potato is a native of the tropics. It thrives with abundant sunshine, warmth, and water, but will tolerate periods of drought. It exhibits several physiological and morphological characteristics pertaining to the management of heat and moisture. Some varieties can be seen to have a digitate leaf form, that would permit increased ambient air flow and help dissipate heat. Other varieties were observed to have a funnel-like leaf shape that would appear to deflect rainwater toward the stem and
roots. The plant shows a wilting response as a further moisture conservation strategem (see photo, fig.21).

The most significant features of root and tuber crops are the pair of attributes that morphologically define these plants and allow them to succeed both in terms of biological survival and as a food source for humankind. The related features are 1) underground meristem or growth-bud, and 2) subterranean energy storage in the form of starch. These traits allow the sweet potato to be propagated from either small roots, from "draws" or sprouts pulled directly from larger roots, or from sections of actively growing vine. The author bears vivid memories of small Haitian burros laden with masses of wilted vines en route to be shared with friends and relatives for seed stock. The vegetative propagation of Haitian sweet potatoes as is commonly carried out has been criticized for failure to select only small tender vine tips. Rolston (1988) noted that commonly used roots and larger mature vines harbor and carry-over pests such as the sweet potato weevil (Cylas formicarius elegantulus), and Pierre-Jean and Tremblay (1985: 13) singled out the same pest as a significant constraint to expanded production. Observations by the author in northwestern Haiti usually found the sweet potato intercropped with some kind of bean—common red and black, lima, black-eyed pea and pigeon pea—but also found more diverse combinations including manioc and maize.
Fig. 21. Just above Port-au-Prince, plantings in a slash-and-burn or boucan field: maize and two varieties of sweet potato vines. Notice the cordate or heart-shaped leaves in foreground, and lobed leaves in center of photo.
Other root crop advantages derive from the subterranean placement of food storage and meristem. The valuable part the crop is protected from above-ground environmental ravages of natural forces. If animals browse off the plant at ground level, it can re-sprout if time permits before the dry season sets in. Similarly, the food below might even be hidden from other humans—share-crop creditors or tax collectors who might exact an in-kind levy upon produce—a practice not unheard of in the Haitian peasant's long struggle to be left alone. If the cultivator later suspected that some roots had been passed over in the digging, the family pig could be released in the jadin to put to use his talent for "rooting"—sniffing out and unearthing food.

THE TRUE TROPICAL YAM

The true tropical yam, *Dioscorea* sp., also stores food energy underground in a tuber. This underground placement of its heavy "fruit" frees the plant from expending its energies in growing woody support tissue. Instead there arises a proliferation of free-form, fast-growing vines with grasping tendrils. These vines take on an aspect that is aggressive and opportunistic in their search for sunlight, one of the most limited resources in a tropical forest environment. While the vine bears some resemblance to that
of the sweet potato, its tuber more resembles the large hairy corms of the aroids cocoyam and taro.

The true yam is a viny climber par excellence. The Haitians like to plant yams at the base of small tree trunks left standing in bois neuf or swidden clearings to facilitate this climbing search for light in the forest. This "search" can be quite remarkable in its vigor. The author has recorded a yam vine growing exactly one meter or almost forty inches in a five day period, after emerging from a tuber buried in a rich organic loam—an average growth of eight inches per day.

The yam is much more limited in area and tonnage of production than the sweet potato or manioc. This is not surprising given that it is more limited in environmental requirements as well. In northwestern Haiti it is grown in the cooler, moister upslope zones, primarily 300 to 1000 meters above sea level, and roughly analogous to the coffee zones. On the windward slopes of Morne Haut Piton, yam planting was observed just prior to the onset of heavier rains in May. In forest patches cleared by cutting and burning, tree saplings were left standing, and additional poles were positioned among the yam mounds to provide support for vines (see photos, fig. 22). When the yam guinée variety was planted in late April, violet-tinged sprouts of yam susu were already emerging from their mounds. By that
Fig. 22a. Mounds of the true yam, probably *Dioscorea cayennensis*, newly planted in mid-May, about 400 meter elevation, wet windward slope south of Port-de-Paix. In background is coffee, unpruned and with spacing of less than one meter, or only about two feet.

Fig. 22b. The checkerboard pattern of large mounds accompanied by poles for climbing vines identifies this field to be yams rather than sweet potato. The location is near the crest of Morne Haut Piton, at an elevation of almost 1100 meters.
time vines of *yam siguin*, planted still earlier, were well up in the trees, several meters high.

Yam tubers run deep and are relatively difficult to dig. Thus it has a relatively poor energy return per unit of labor input, and higher production costs. Peeled and cooked, yam looks and tastes something like the potato. Of the various root and tuber crops, the yam is relatively high in market value (Pierre-Jean and Tremblay 1985: 6, 9-10). It holds out the promise of high commercial yield potential—especially *D. esculenta*, and to a lesser extent *D. alata*. (Haynes, *et al.*, 1972: 221, 225-6)). Unlike the sweet potato that originated in the American tropics, the yam is an Old World plant, with some species native to Asia (*D. esculenta*, *D. alata*) and others native to West Africa (*D. cayennensis*, *D. rotundata*) (Coursey and Haynes 1970; Murdock 1960).

**MANIOC**

Manioc or cassava, *Manihot esculenta*, is an important yet easily overlooked food crop in Haiti. It brings only a modest price in the marketplace. Yet its value as a dependable subsistence commodity would be hard to measure. Converse to the afore-mentioned yam, manioc yields a very favorable return of food calories, per unit of human energy expended in its cultivation (Coursey and Haynes 1970: 261).

Originating in the New World Tropics, manioc diffused eastwards to Equatorial Africa, where there was a pre-
existing familiarity with root and tuber forms such as the *Dioscorea* yam. There manioc would grow in importance to become perhaps the foremost starchy staple of Sub-Saharan Africa today.\textsuperscript{13}

Back in Haiti, Moral (1961: 203) noted that manioc is prominent in the Cayes plain in the far southwest region, and on the Plain du Nord. Street (1960: 301) emphasized manioc's presence in the southwestern region. Field observations corroborate Pierre-Jean and Tremblay's (1985) extension of its area of greatest emphasis to include the Hinche area of the central plateau, the Gonaives vicinity, and west from Port-de-Paix in the Northwest.

In relation to manioc's low market value in Haiti, one virtually never sees whole roots for sale in the marketplace. Rather, weight is saved and value is added by the peeling, shredding and drying of manioc into meal or flour. The processing is carried yet further in the retailing of *cassave* or manioc griddle cakes. *Cassave* cakes were mentioned earlier in this work in the context of their being peddled by the roadside at a remote bus stop. The flat cakes, could be bought with or without hot spicy peanut

\textsuperscript{13}Cultures of the Zaire basin consume a staple dough of manioc and maize meal called *bedia*. They say no meal is complete without a little *bedia*, which would be analogous to the Nigerian *fufu*, or to the *fungee* of Angola which bears that same name in Jamaica. In southern Zaire the leaves of manioc, high in protein, are also cooked as a potherb, called *matamba*, but no evidence of this practice was found in Haiti.
butter, mamba pistache. This is one form of Haitian "fast food," and the author was grateful to find it far from town.

A rural scene vividly preserved in memory, centered upon a ti kay, or little house of wattle and daub, with earthen floor. One of so many dwellings unobtrusively scattered across the countryside, this particular hut stood by a path in the hills just south of Jean-Rabel in the far Northwest. There, visitors on a reconnaissance hike paused to chat with a peasant woman who shredded peeled manioc roots. She used what might be called a "coffee can" perforated with jagged-edged nail holes. Between her bare feet darted several hens and pullets, scurrying to peck up fallen manioc crumbs. Haitian visitors observing this speculated on the fowls' chances of being poisoned by the hydrocyanic acid in the uncooked bitter manioc, a not unheard of event.14 The foreign visitor present was dissuaded from photographing this woman, with the implication that reliance upon manioc was not a source of pride to many Haitians of humbler means.

Other Haitian cultivators at Matthieu, just southwest of Port-au-Prince, demonstrated the planting of manioc. They gouged a small furrow with the general purpose machete, they held a length of manioc stem down in the furrow, then whacked off about one third of a meter and covered it, all

14Street (1960: 299) noted the occasional death by poisoning of swine rooting in manioc patches.
with a minimum of wasted motion. In the Northwest manioc was most often found interplanted with maize and sweet potato.

Pierre-Jean and Tremblay (1985: annexe 9, table 13) reported spring planting for most of the country, but showed planting all 12 months of the year for the Port-de-Paix area in the Northwest. Moral (1961: 203) wrote that most Haitian manioc is the bitter version, and that its season runs roughly from May to February. An elderly gardener with a small plot in Port-au-Prince told the author he would dig his sweet manioc in January. Informants near Bassin Bleu in the dry Northwest reported that manioc was sometimes left in the ground for 12, 18, or even 24 months before digging.

Familiar to anyone who was reared in Haiti, manioc has figured prominently in contemporary popular culture of that country. In a metaphor for popular political/economic reform, protesters declared they would figuratively "raché manyok," or uproot old manioc, clearing old "fields" or power structures for a fresh new "planting" of political leadership (Wilentz 1989: 136-7, 220-1).

A cultural geographer can hardly help but marvel at the rich and witty lexicon of names of local varieties of food crops. Moral (1961: 203) mentioned the "Ti Malice" variety noted for its high quality starch. He did not point out that the namesake, "Ti Malice," is one of the best-loved characters of Haitian folklore, a homologue of Brer Rabbit.
Pierre-Jean and Tremblay (1985: annexe 14) noted research efforts concentrating on the yield potential of a particular variety, "Ti Crispin" of the Jacmel valley. Crispin was a folk hero of Haiti's struggle for independence. In the Northwest, near Bassin Bleu, one finds the sweet manioc varieties, "Matitla," and the red-petioled "Maissade," said to be the sweeter of the two. In the early 1980s, horticultural projects were under way to collect and catalog named varieties of root and tuber crops all over Haiti (Pierre-Jean and Tremblay 1985: annexe 14).

FAO (1987: 141) production yearbooks report mean national yield levels of about 4 to 5 metric tons per hectare (MT/ha). Street (1960: 300) gave the figure of 15 tons per carreau as an "average yield" on the Cayes Plain, which would work out to about 12 tons per hectare. Pierre-Jean and Tremblay (1985: 9) cited experimental yields in northern Haiti of 15.6 MT/ha.

Mean agricultural or farm yields for manioc for much of the world fall in the range of 10-20 MT/ha, with 7 MT/ha for the continent of Africa (FAO 1987: 141). Horticultural or experimental conditions at Mayaguez, Puerto Rico gave yields approaching 40 MT/ha (Ramirez, et al, 1983: 18). This may suggest significant potential for increase in food production in Haiti, and in fact, Pierre-Jean and Tremblay (1985: annexe 14) noted cooperative root crop projects between a team from Mayaguez and Haitian agronomists.
Elsewhere, manioc yields of 77 MT/ha have been recorded under optimal experimental conditions (Goodland, et al., 1984: 27).

However, a peasant farmer in Haiti has difficulties supplying optimum conditions for maximizing yields, handcuffed by lack of credit for fertilizer, lack of distribution networks for improved varieties, lack of market certainty that might justify higher production costs, and lack of stability in land tenure that might otherwise encourage investment of time and energy in improving soil texture and tilth.

THE POTATO

After the three foremost root and tuber crops, appears a second tier of crops in terms of level of importance. The first of these is the "Irish" potato, Solanum tuberosum, a native of the Andes Mountains of South America. The potato is a plant of cooler temperate regions and thus is environmentally limited in Haiti. Cool temperatures are necessary for starch storage in the tubers, or to form the potatoes. Relatively warmer, wetter conditions favor green vegetative growth and are likely to render the plant more susceptible to fungal and viral attacks. Mexican varieties show relative promise of resistance against these diseases (Horton 1987: 42). When some successful food crops of the temperate climates are cultivated in the shorter summer days
of the tropics, they do not flower well and bear correspondingly little fruit. This is much less of a problem with the root and tuber crops, as starch is stored in plant parts other than the fruit, and propagation is usually from asexual cuttings rather than from seed.

Despite the ecological and cultural constraints to potato production in Haiti, the plant offers substantial potential for producing large numbers of food calories on a small area of land, just as the sweet potato and manioc do. Potatoes are presently grown in Haiti on the cooler slopes of the Massif de la Selle near Kenscoff, for the urban consumers of Port-au-Prince down below. There is also said to be potato production on the Rochellois Plateau (800 m. elevation) in the Southwestern peninsula (Pierre-Jean and Tremblay 1985: 2, 13).

In terms of biology, production might be expanded to the rich Plaisance Basin (500 m. elev.) just south of Cap Haitian, or even to Morne Haut Piton, looming above Port-de-Paix in the Northwest. However the potential producer is ever facing economic realities and some of these constraints are listed by Pierre-Jean and Tremblay (1985: 13). Is there a market for potatoes in Port-de-Paix? Can they be stored and shipped as easily as cured sweet potatoes can be? Are the plants as hardy and resistant to pests? How can the small cultivator be expected to innovate and to experiment with something so little known given the absence of
agricultural extension support, limited local seed sources, frequent indebtedness and the ever-present specter of imminent financial ruin?

OTHER ROOT AND TUBER CROPS

Most of the second and third tier root and tuber crops are plants that are not distributed over the entire country, but tend to be regionally specialized even more than yams. Of the ones not yet discussed, the related aroids of the second tier, taro and yautia, are most common. Both are usually planted in very wet sites (see photo, fig. 23). Both of these roots are cut up into chunks and stewed in soups; as well as mashed, formed into coarse dumplings and deep-fried. These crunchy cakes, known as akra, have West African origins and the same name is used in Ghana today.

Pierre-Noel (1971) indicated the presence in Haiti of the other crops of the third tier, but of these, only arrowroot was found by the author, and that was not a field crop, but a specialty item of the lakou, known for its starch easily digested by toddlers.

"Maize, Beans and Squash"—
Are Haitian Food Crops "Latin American?"

One might think of Haiti as agriculturally located at the intersection of West Africa and Latin America. While the array of food crops in Haiti boasts many components from
Fig. 23a. Taro pond, relatively lower elevation of about 300 meters, wet windward slope just south of Port-de-Paix, Northwest Haiti.

Fig. 23b. Taro pond surprisingly encountered at an elevation of about 1000 meters, south of Port-de-Paix, in a zone of virtually no other crop cultivation (only grazing).
Europe, Africa, and other parts of the Old World Tropics, elements or combinations traditionally associated with Native American and Mestizo Middle America should not be discounted in Haiti.

The model of the "maize, beans and squash" triad of dominant dietary staples of mainland Middle America can be extended to Haiti of insular Middle America, and one might be surprised to see the degree of "fit" in the foodways of Haiti. While the previous section of this writing emphasized the paramount importance of root and tuber crops in Haiti, this researcher was impressed by the extremely wide extent of maize under cultivation in Haiti.

Squash is, perhaps not surprisingly, the least important of the three. However squash, pumpkin and their cucurbit cousins fit well into the conuco garden system of mounded, tangled intercropping owing to their viny growth form. They either climb vigorously or go sprawling across the ground as opportunity allows.

Haitians would not bother to cultivate these plants if there was no place for them in the foodways of their culture. With the United States Coast Guard temporarily housing several thousand Haitian political refugees at Guantanamo, Cuba, care was taken on at least one occasion to feed them giraumont or pumpkin soup as an expected dish associated with holidays. In Haiti, pumpkin soup is often served for Sunday lunch. Wilentz (1990: 380-2) recounted
the tale of an infamous Haitian army colonel and power broker who was allegedly fatally poisoned by way of his favorite pumpkin soup.

BEANS AND PEAS

Of "maize, beans and squash" the beans component is most important in Haiti, and there perhaps lies the main departure from the traditional Middle American formula. With root and tuber foods for starch, as well as the not insignificant staples plantain and avocado, one could remove maize from the jadin or the table, and carry on nicely. Cereals do claim advantages for storage and trade, but beans possess some of these same attributes. An examination of beans and peas in Haiti—both termed pois in Creole—provides insights into virtually all of the major themes swirling through the agricultural economy of Haiti today.

Firstly, one can trace ancient traditions in the fundamental subsistence pairings of starchy cereals with beans. Secondly, those subsistence traditions can be contrasted with the daily dynamics of Haiti's vigorous commerce and thriving capitalism, as reflected in Murray and Alvarez' (1975) study of bean marketing. Thirdly, poverty and need for economic development are frequently characterized and illustrated with examples of malnourishment. Protein deficiencies of children and mothers are often redressed economically with supplements of
leguminous foods such as soybean or peanut products.

Fourthly, the mention of soybeans conjures up the sometimes bitter relationships of trade, aid, and dependency between nations of the developed "North" and less developed nations of the "South" or Third World. There are powerful reasons why the U.S.A. has not promoted soybeans, the highest protein bean, in the poorest country of all the Americas. These reasons are related to the facts that 1) soybeans constitute the largest US agricultural export by value, 2) yet US consultants once helped to establish soybean production in Brazil, and 3) Brazil has unexpectedly emerged as the leading rival to the U.S.A. as a soybean exporting nation. Policy makers in this country are not likely to encourage initiation of soy culture anywhere else, however nutritious the bean might be. Lastly, an increasingly crowded country with a fixed base of arable land, faces more and more of the difficult moral choices of modern times. Is it conscionable to promote the growing of soybeans or peanuts in Haiti as agribusiness, with emphasis on oil content, or for export as high-value animal feed, while all around are impoverished men, women, and children — hungry and malnourished, lacking food purchasing power and lacking land of their own?

Cajun red beans and rice, Cuban black beans and platanos, Mexican frijoles and maize tortillas: the common folk of Latin America have long survived upon these pairings
of legume and starch. This sort of linkage is prevalent in Haiti, although one may find oneself sampling numerous combinations of the two elements.

Whatever bean is used, it is likely to be cooked and pestle-pound into a sauce or thick soup that in turn is ladled over the starchy vegetable or vegetables of the day. Rice is the preferred starch when income permits, but maize is also eaten coarse-ground and cooked similar to cornmeal mush or grits. Grain sorghum, piti mil, is also employed in this manner, but is considered by up-scale urbanites to be a rustic dish of country folk.

Of the four most prominent peas or beans in Haiti, one of the most common is the pois rouge or pois noir (Phaseolus vulgaris). This of course is the red bean or black bean, taxonomically the same thing.

Of greater import to the Northwest is what is usually known in English as the Lima bean (Phaseolus lunatus), and in Haiti termed the pois cheuse. It is nutritious even by the high standards of beans in general, of strong demand in the market-place, and appears prominently in the rice dish, diri arrosée. Most importantly, the plant seems to have some degree of drought tolerance.

The most typical pea or bean of Afro-American foodways is the field pea (Vigna sp.), in Creole the pois guinée or pois inconnu. This bean is known for hardiness; a degree of
drought tolerance, and ability to make a crop in soils of lesser fertility and higher clay content.

Lastly the pulse of greatest hardiness in the dry Northwest is *pois kongo*, the pigeon pea, *Cajan cajan-us*. The plants are tall, spindly, fibrous, and coarse. The beans themselves are small and are of such little market value that they are sold in the hull, *nan calé*. Most cultivators will devote a substantial portion of their *jadin* to higher-value beans, but will frequently keep a prudent reserve patch of *pois kongo*—just in case (see fig. 24). Other lesser peas and beans are encountered, including:

---

-- *pois blanc* (*Vicia faba*)
-- *pois de merveille* (*Cardiospermum halicacabum*)
-- *pois france* (*Pisum sativum*)
-- *pois gratté* (*Mucuna pruriens, Tragia volubis*)
-- *pois manioc* (*Pachyrhizus erosus*)
-- *pois maldioc* (*Canavalia ensiformis*)

**MAIZE**

The word "maize," comes from the Arawak Indians who were already growing maize in Haiti when Christopher Columbus arrived there in 1493. Today maize is consumed in various ways in Haiti:

1. "Parched corn," on the cob, is sold on the streets of Port-au-Prince.

2. *Mais moullu*, or milled maize, is roughly equivalent to grits or corn-meal mush, and in urban areas might be considered a "poor man's rice."\(^{15}\)

\(^{15}\)In the spring of 1986 the rice to maize price ratio observed was about 3:1 in Jean-Rabel, with rice around $2.90 per *gros marmite*, and maize right at $0.90. The
3. Akanson, is a partially fermented corn porridge. This is a popular dish to feed children for breakfast, and makes a light supper for children or adults.

Almost a decade ago, the author was surprised to see the broad-ranging presence of maize or "corn" in both consumption and in production. It is grown in all parts of the country. Moral (1961: 201) said the culture of this crop was the most widespread of all cereals, by far, and that virtually every farm grew some. It should be placed on a par with sweet potato with both near-omnipresent.

In terms of national output tonnage, Haiti's harvest of all roots and tubers was about four times that of maize in a typical year of the mid-1980s, with sweet potato accounting for about half of the root and tubers figure, or twice the output of maize (FAO 1987: 139-43). It should be noted that roots by weight contain a significantly higher percentage of water content, and on a caloric basis, the maize would come closer to roots in importance. Pierre-Jean and Tremblay (1985: annexe, 33 ff.) cite a nation-wide crop importance survey that ranked maize the number one crop, out of ten crop choices in thirteen of the nineteen districts.14

14With maize given an aggregate national importance ranking of 1st overall, the haricot or red bean came in 2nd, followed by sorghum 3rd, pois kongo a surprising 4th, and manioc 5th. Sweet potato was not included in the list of 10 crops compared in this particular survey.
Fig. 24. Pigeon peas or pois kongo (*Cajan cajan*) in the hills just south of Jean-Rabel, Northwest Haiti. These plants, here over two meters tall, resemble the related beggarweed (*Desmodium* sp.) of the Southeastern U.S.A. Though unimpressive in appearance, pigeon peas provide a hardy and reliable protein source in times of drought.
Upon observation of spindly, withered maize plants in the arid Northwest in 1986, cultivators were asked why they did not try growing sorghum instead. They explained that the sorghum area was over in the next town, and that in the Jean-Rabel area they grow maize. There appears to be considerable inertia of custom at play here, as well as calculations of higher market value for the maize, even if its chances of making a crop are more of a gamble. A further practical reason for not growing sorghum appears to be the extreme vulnerability of its more palatable varieties to bird depredation, especially by the "village weaver" bird (Ploceus cucullatus), a transplant from Africa (McKenna–St. John 1986; Street 1960: 309).

A custom observed in the field in the Northwest is the practice of planting four or five maize seeds to one hole. Street (1960: 292) alluded to the same practice in Southwestern Haiti. This practice dates back to medieval European origins where cereals other than maize were grown. It has some practical basis in that some seeds were likely to fail to germinate, while others would be lost to predators; based on average success rate of sprouting, a rule of thumb was worked out for how many seeds to allow. However, when all four or five seeds in a hole sprout, the prudent cultivator is behooved to thin seedlings to concentrate vigor into one good stalk (see fig.25).
Fig. 25. Not sorghum, but maize, planted four seeds to the hole. This was once the custom with French grain cultivators as well, knowing they would need to allow for one or two seeds that would fail to germinate, one for the crow, and one to grow.
Numerous indigenous varieties of maize included short-season ones of as little as three or even two months, while other varieties took over six months, and up to nine months to mature (Moral 1961: 201; Street 1960: 292-3). Plants observed in the Northwest in the mid-rainy-season of spring 1986 were most likely of the shorter season varieties.

The maize seen in the marketplace of Jean-Rabel, Northwest Haiti, was of the "flint corn" type, with kernels shaped like teardrops. Street (1960: 293) wrote that flint corn varieties were more common than dent corn, apparently because of greater resistance to weevils and to smut. Pest concerns prompt a traditional mode of storage, the gwann, an arrangement where ears in the husk were roped together in a large nest or cluster, and then suspended from an elevated pole or tree fork (fig. 26). Street (1960: 294) said the royal palm was preferred for its rat-resistant smooth trunk. Desrouilleres (1981: 1-14) listed other trees used — some with spiny trunks — and noted that the gwann minimized rodent problems, but that weevils and moisture-induced molds and smuts still caused substantial losses.

Storage abilities are of utmost importance. As they are relatively drier and more concentrated in food value than bulky roots, cereal grains and especially maize have long constituted key commodities of trade. Superior storage facilities give one the ability of marketing the
crop long after the harvest season, and thereby getting a better price.

Storage capability translates to economic power. Maguire (1989: 2, 5-6) wrote of peasants forming cooperatives in the late 1980s who identified grain storage as one of their highest priority needs. They invested cooperatively to build barns, which in turn, threatened the status quo of local grain speculator-money lenders. On moonless nights, new barns were burned to the ground, and no police investigation was expected from anyone savvy to the local realities (Maguire 1989: 6-10, 16-18). If discouraged cultivators—perhaps co-op organizers—throw down their machetes and walk away, are they making a purely economic move, with no politics involved?
Fig. 26. Maize storage in the husk, intended to be out of the reach of rats. This method is called the gwann (Street 1960; Desrouilleres 1981; Maguire 1989).
The small farmers or petits habitants have little of the three conventional factors of economic production—land, labor, and capital—at their disposal, and this paucity of resources is reflected in the animals that they keep. The precariousness of this existence only allows for the presence of farm animals that are a) small, b) hardy, and c) versatile, adaptable to different agro-ecosystems. The qualifying species are swine, goats, and chickens. The resource constraints involved are as follows.

For a small farmer, the most obvious limiting production factor is lack of land. This constraint has impact upon animal husbandry in both the lack of physical space for animals and in lack of feed production capability.

A "peasant" farmer is an impoverished farmer, poor in capital, unable to afford investment in either a large quantity of animals or in a high quality of superior breeding stock. Nonetheless, livestock—a single animal—is likely to be the very medium chosen for investment should the family be able to save a little money.

The remaining production factor, labor, is also stretched to its limits in Haitian animal husbandry. While the farmer's time and energy are subjected to many potential
demands, there are fewer practical applications for the abilities of his numerous children, and it falls to their lot to watch over the goats browsing on the commons. Clearly goats are much more tractable and amenable to tending by children than cattle would be.

As previously alluded, a few head of livestock preserves savings in a form easily liquidated in time of need, and is more directly a reserve of food for the family. Such a strategy of keeping the animals viable for an indefinite period of time calls for a means of expending upon the scraggly beasts a minimum amount of high-value food such as cereal grains. Conversely, the animals are expected to forage for weeds and by-products not otherwise of economic value—swine, goats and chickens all excel here.

Lastly, in a world where "little people" or small producers are bullied, arbitrarily taxed and generally exploited at every turn, they feel compelled to do all they can to minimize indebtedness to middlemen in the marketing chain. In this regard, the farm animal aids agriculturalists by transforming and adding value to scant home-grown produce and in marketing this transformed produce, perhaps upon its very own legs.
Goats in Haiti: Small, Docile, Unrelentingly Hungry

Someone once said, "Show me goats, and I'll show you poverty." Haiti has goats in abundance and poverty as well. Goats are much in evidence on the cultural landscape of rural Haiti, the animals themselves representing a primary culture trait of a complex of traits. Secondary or derivative traits can be traced in Haitian cuisine, common names of plants, toponyms or place-names, and in folk proverbs, as well as in material culture directly related to goat husbandry.

Street (1960: 351) termed the goat the "ideal animal for the Haitian subsistence farmer." This association can be traced back to the Bantu or "Sub-Saharan" part of Africa, the leading continent for goat culture, where thirty percent of the world's goats are found. There is no doubt of the importance of the goat in the cultural ecology of the Haitian peasant farmer. Yet questions remain concerning the sustainability of keeping such voracious and relentless herbivores in a land so stripped of arboreal vegetation.

17 There are functional explanations that can account for such an association. 1) Goats, with their browsing-of-woody-plants mode of herbivory, do not fit well in the grain and pasture crop combinations of Western farming systems, nor do they fit well in urban/industrial environments. 2) Inferior carcass conformation and meat yield, along with additional off-tastes, smells and perceptions, renders goat meat (and to a lesser extent, the milk) lower in consumer demand relative to other meats, lower in price, and therefore relegated to the lower socio-economic classes.
Simple observation belies the sensationalist hyperbole that "no trees remain in Haiti," but there is no denying that extensive areas such as the Cul de Sac valley and much of the hinterland around Gonaies have been virtually denuded of substantial plant cover. In this process, the placid little goat played no small role.

Any discussion of livestock in Haiti of the 1980s must surely be framed in reference to the swine situation. Hogs figured so largely in the culture and economy of Haiti, that the role of any other species of food animal could not help but bear significant impact, as swine numbers were reduced to near zero. This is especially true for the goat. Like the hog, goats are virtually "omnivorous," or more accurately, broadly herbivorous—they might even be termed "herbivorous with catholic tastes." While the goats are ruminants, they shared a niche with hogs in the manner of confined feeding of many organic waste products. Goats are usually tethered in Haiti rather than herded and both goats and swine are likely to be fed food by-products such as bean husks, sweet potato vines and peelings of bananas and mangos.

FROM ASSET TO LIABILITY

In the 19th century, the Haitian peasant farmer was a "drop-out" from urban society, largely because of the danger of impressment or forced recruitment into armies and labor-gangs. He took to the hills, growing coffee under the
forest canopy, and clearing new land in a swidden or "slash and burn" system of cultivation. The hardy little goat, able to browse and forage for itself in uncultivated brush and forest, was an unqualified blessing, an asset of clear utility.

Today, however, the peasant farmer is very much part of a commercial economy, a micro-scale "agri-businessman," the patriarch scratching and scrambling with his wife to support several children and extended family members. The goat offers efficiencies in two ways: 1) it fills a special place in a vertical economic chain as it consumes the aforementioned food scraps and wastes and converts this to food stored "on the hoof." 2) it fills a horizontal or spatial niche as its browse style of herbivory allows utilization of wasteland that has grown up to brush, weeds, and other forms of seral vegetation.

However, the usual mode of goat production in Haiti is neither extensive herds on uncrowded ranges, nor intensive stabling on the private homestead with the associated feeding of high value forages and concentrates. Rather, goats are pastured on "the commons," along roadsides and on lots not perceived to be in use, although they may be in a stage of brush fallow. The animals are either tethered (in Creole marré, in French à picquet) or allowed to roam free near the homestead. In the latter case, they are likely to bear a tri-cornered wooden frame fastened upon their necks
as a means of blocking them out of house doorways and narrow hedge gaps.

In the tethered mode (fig. 27) the goats are allowed to browse in a limited area, and additional "green-chop" is cut and carried to the animals, pending its availability. Many trees and shrubs are "fair game" for the goats, but leaves of certain genera stand out as particularly comestible: *Fraxinus* (ashes), *Celtis* (hackberries), *Guazuma ulmifolia*, *bois d'orme*, so common in the Northwest, along with many genera of the legume family. As more and more branches are lopped off to feed increasing numbers of goats, a tree may become so severely coppiced as to resemble a post—a living post. Goats sometimes will strip bark from trunks of trees, perhaps girdling and killing them in the process. Sprouting in vain, tree seedlings are likely to be eaten down to ground level. In this environment it may be that the goat has become a liability or even a "curse."

Another factor in the goat's threat to environmental sustainability is its considerable prolificacy. While sheep have more single births than twins, goats most commonly bear twins, and triplets are almost as common as single births. Onset of puberty—i.e. breeding capability—can occur as early as the age of four months. This precocity and vigor can wreak havoc with ecological stability. For example, Furon (1958: 32) wrote that the island of Madagascar had no goats prior to 1936. In 1937 it had 1000. In 1946 there
Fig. 27. "The gentle little goat, arch despoiler of the earth" (Furon 1958). Typically tethered in twos or threes, in contrast to the larger, free-ranging herds of less-crowded countries.
were 23,000 and in 1949, 203,000. At the time of Furon's writing, he observed that parts of Madagascar had been "transformed into desert." Today's goat population in Madagascar is about 1,100,000, averaging five goats per square mile, and the island is a case-study in environmental degradation. Yet, Haiti has 1,200,000 goats in 1/20th the land area, averaging 112 per square mile (FAO 1988: 247).\(^1\) Devendra (1981: 47) predicted the 1976 to 2000 increase in world human population to be 56%, for sheep to be 79%, and for goats to be 118%.

Allowing "does"—young female goats—to breed at less than 18 months adds the physiological stress of pregnancy to the demands of juvenile growth. This coupling of demands upon the body of the animal is likely to result in stunting unless exceptional nutrition is provided at this time. Genes may also contribute to smaller size of Haitian goats if a significant fraction of their forebearers came from the West African lowlands, from whence came most of the ancestors of Haiti's people (Simpson 1988: 141). In any case, Haitian goats tend to be small; a mean carcass weight of 8 kg. is light by international standards. The world mean carcass weight is estimated at 12 kg., that of Africa

---

\(^1\)While Mexico has more goats by far than any other country of Middle America, little Haiti is second (FAO 1988: 247). Haiti's herd of 1,200,000 is over twice as large as that of the next country, the Dominican Republic (534,000). Still smaller herds are estimated for the other Antillean countries, Jamaica (440,000) and Cuba (110,000).
also 12 kg., and the North and Central American average put at 11 kg. (FAO 1988: 260).

Nonetheless, goats in Haiti are raised almost exclusively for meat. Milk production in most species of domesticated animals is reduced in hotter climates and in the hotter weather periods of relatively cool climates. Irregularity of feed quantity and quality further inhibits milk production, and the animals are not bred to enhance milking performance. As with hogs, the meat goats constitute a "bank account" on the hoof. The accounts are liquidated—the animals are sold for slaughter—when cash needs are greatest, or market conditions are most favorable. The latter is most likely to fall in the month of December in anticipation of Christmas and New Year's holiday festivities (Coimin et al 1980: 2).

While pork griot was the cherished national dish of Haiti, the hog demise of the mid-eighties contributed to the relative ascendancy of goat dishes such as tasso. The term comes from the Spanish tasajo or jerked meat, and can be traced back to the boucans or meat-smoking parties, following the hunts for feral livestock by 17th century seafarers, from whence comes the term boucanier or "buccaneer." As with almost any country of the less-developed world, the rural peasant will consume meat but rarely, while upscale families will do so on a regular basis.
Further insights into the traditional place of the goat in Haitian society can be ascertained in folk proverbs. As in various Biblical passages, the Haitians counterpoise the goat with the sheep in:

Zafe kabrit pa zafe mouton
(The goat's business is none of the sheep's affair)

A more ambiguous saying tells us:

Kabrit gadé je mèt
kay avant-la antré
(The goat looks at the eyes of the master of the house before entering)

As for popular names of plants, Pierre-Noel (1971) lists no less than six plants with common names relating to goats. These would tend to be either plants that goats are known for eating, or plants that bear resemblance to some physical feature of the goat, such as the horns (table 7).

Toponyms, or place names on the landscape, do not appear to serve as good indicators of goats in the culture. Perhaps the very omnipresence of goats would render the term rather ineffective in distinguishing one crossroads or village from another. A few examples can be found, however, in the Ile à Cabrits, a small island just to the northeast of Port-au-Prince; Savane Bouc to the northwest of Hinche; Fond Cabrit to the west of Jacmel; and Bois Cabrit, a short distance farther west.
GOAT HIDES AND LEATHER

A final aspect of goats in the geography of Haiti is based in the past, but looks ahead to future economic markets. In a national economy strapped for foreign exchange, made up of individuals desperately striving to garner more cash income, there is always a need for enterprises that can produce goods that are in relatively high demand abroad. Ideally, these should use domestic raw materials, use relatively low technology in processing, and produce relatively high value goods for big retail markets in the United States or Canada.

How do economic development approaches relate to goats in Haiti? If one accepts the premise that poverty—whether at family or national level—is relative lack of income, and not necessarily lack of production capability, then one can envision a need to break the cycle of overreliance upon primary production and the dependency relationships associated with that. It logically follows to look for ways to add value to available resources. In their familiarity with goat hide and leather production, many Haitians possess a basis for expansion in an industry yielding relatively high-value consumer products, requiring relatively little intermediary processing of any great complexity.

Goat hide export is not at all a new industry for Haiti. Moral (1961: 314) noted that Haiti had been exporting goat hides to the U.S.A. since the late nineteenth
Table 7. — Plant names associated with goats

<table>
<thead>
<tr>
<th>HAITIAN AND LATIN NAMES</th>
<th>ALSO KNOWN AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bois Cabrite</td>
<td></td>
</tr>
<tr>
<td><em>Cassia emarginata</em></td>
<td>yellow candle wood</td>
</tr>
<tr>
<td></td>
<td>(Jamaica)</td>
</tr>
<tr>
<td>Capraire</td>
<td></td>
</tr>
<tr>
<td><em>Capraria biflora</em></td>
<td>goatweed tea</td>
</tr>
<tr>
<td></td>
<td>(Jamaica)</td>
</tr>
<tr>
<td>Chevrefeuille</td>
<td></td>
</tr>
<tr>
<td><em>Lonicera caprifolium</em></td>
<td>honeysuckle</td>
</tr>
<tr>
<td></td>
<td>(U.S.A.)</td>
</tr>
<tr>
<td>Corne Cabrite</td>
<td></td>
</tr>
<tr>
<td><em>Urechites lutea</em></td>
<td>bejuco ahoya vaca</td>
</tr>
<tr>
<td></td>
<td>(Dom. Rep.)</td>
</tr>
<tr>
<td>Corne Cabrite</td>
<td></td>
</tr>
<tr>
<td><em>Ibatia maritima</em></td>
<td>guanabanita</td>
</tr>
<tr>
<td></td>
<td>(Dom. Rep.)</td>
</tr>
<tr>
<td>Corne Cabrite</td>
<td></td>
</tr>
<tr>
<td><em>Stigmataphyllum lingulatum</em></td>
<td>bejuco de San Pedro</td>
</tr>
<tr>
<td></td>
<td>(Cuba)</td>
</tr>
</tbody>
</table>

Source: Author, compiled from Pierre-Noel (1971).
century, with level of exports changing little year-to-year, and of the magnitude of 200-250 MT circa the late 1950s. Total goatskin production in Haiti for the period 1979-81 registered just over 900 MT, and a decade later had only increased about 10% to just over 1000 MT. One can view these last figures in two meaningful contexts. Firstly, of 32 countries grouped by the FAO as North and Central America, Haiti was 2nd in total goatskin production, trailing only the much larger nation of Mexico (FAO 1988: 285).

Secondly, in 1984 the U.S.A. introduced the Caribbean Basin Initiative (CBI). This program aimed to lower production costs of U.S.A.-based assembly industries by utilizing the relatively low-wage labor of the West Indies, boosting the economies of the region, and rendering them less susceptible to communist overtures. Products manufactured in the region are awarded a duty-free status for marketing in the U.S.A. Entrepreneurs from the U.S.A are not unaware of the opportunities here; Canvas and Leather Bag Co. of Melville, New York had a subsidiary in Port-au-Prince in 1986 (Treaster 1986). While profits of US-owned industries flow back to the U.S.A., Haitian-owned companies would also qualify for the program.

This latter case would give Haitians an opportunity to benefit not just from unskilled wages, but also from value added to their own domestic materials. Haiti has goats—the
second largest herd in all of Middle America and almost as many as the U.S.A. Haiti has a tradition of processing goat hides into leather, and an opportunity is presented by the disparity in retail prices of goat kidskin versus cowhide. In 1990, when soft 2-oz. cowhide, and 2-oz. "senior" calfskin, retailed for $4 per square foot, better quality Morocco kidskin brought $5 per square foot.

Humble Hen and Fighting Cock

On a small farm one would expect to find small livestock, what the Spanish in the New World once termed ganado menor. If we chose the species of most significance to the peasant farmer, it might well be Gallus gallus, the humble chicken. The dietary flexibility and foraging ability of this animal commends itself to a mixed farm with an irregularity of feeds, varied in menu and intermittent in supply. Yet perhaps its value in the rural economy is transcended by its importance in the folk culture.

Chickens are much in evidence on the cultural landscape of Haiti, with significant roles in both ritual and games, as well as in everyday subsistence. Haitian chicken producers were presented a narrow window of opportunity when swine and pork were virtually unavailable for a time after the plague and eradication campaign of the early eighties. Apparently there was a significant increase in both
magnitude of chicken consumption and price during this period.

Chickens are raised for production of eggs, an important source of cash income. During 1986/87 when eggs were 96 cents per dozen in the marketplace of Jean Rabel in the Northwest, they sold for $1.50 in the national capital. It is said that poorer egg vendors virtually never eat eggs. The output of laying hens is a function of variables such as breed, nutrition and optimum day-length. The productive egg-laying life of hens is of a limited duration. Afterwards, the hens are consigned to the stewpot, although spent laying hens are not comparable in meat quality to plump young broilers of meat breeds.

Poultry production in Haiti is troubled by a variety of pests. Street (1960:358) wrote of Newcastle disease in Haiti and how the disease was then perpetuated in the ecosystem, harbored in wild bird hosts. Today rats represent a serious pest problem in chicken production, at times eating both eggs and chicks, but most of all, ravaging stocks of grain stored for chicken feed. A former director of a vocational agriculture school in northern Haiti (Fecho 1984) noted that rats were a particular nuisance in hen-

---

FAO (1988: 247, 250) sources estimate a more than two-fold increase in chicken population stocks of circa 1980 to 1988, from 5 million to about 13 million. During this same period, goat inventories are estimated to have increased about 20%, and hogs to have recovered to about 60% of their previous numbers.
houses that had been built light and open to maximize ventilation in the sweltering tropical heat.

In the mid-eighties one could see evidence of a heightened interest in poultry production in Haiti. A tour of the St. Barnabas vocational agricultural school in Terrier Rouge, east of Cap-Haitian, featured a look at the school's chicken houses. The director claimed his students were impressed with the tangible results of the poultry project, and that they were beginning to invest in their own commercial ventures. Constant warfare was waged against rats, but no mention was made of the introduced mongoose pest that Street (1960: 354) recorded.

Further to the northwest a would-be entrepreneur in Haitian poultry, Ti-Joe, gave this writer a tour of rural landscapes and sketched out his commercial dreams. Coming from a middle-class landlord family, Ti-Joe had a relatively good backing of commercial capital, as well as the benefit of agriculture coursework from the University of Florida. The business opportunity was all too apparent to him in the altered market for meat of mid-1986. He envisioned the opening a broiler-raising operation on the northern outskirts of the Port-au-Prince metropolis. His plan was to buy chicks for forty cents (two gourdes) and to sell broilers for $2.50 to middlemen at the farm gate, who would probably retail them for $4 in Port-au-Prince.
The flow of chickens from the countryside to the urban market is striking to the observer who rides the public buses into the primate city from "les provinces." There are always bound birds, submissively stowed amid the feet of the riders on the floor of the bus. Transactions may be attempted en route as witnessed by this writer upon a sailing ferry between the island of La Tortue and the port of St. Louis du Nord. An elderly man took a rooster from a marchande and scrutinized it thoroughly before asking its price. Upon hearing the quote of $7, he abruptly ended the bargaining and handed back the bird. Even though the sale was not made at that price, the magnitude of the price under consideration indicates that the fowl was probably a fighter, a kok de kalité. Also conveyed here is the concept of concentration of value from land of low productivity, into a small prized animal, a conveniently marketable unit.

Street (1960: 355) pointed out that a major distinction between chickens in Haiti is whether they are poule Manille for ordinary farm usage or whether they are poule de kalité, of higher esteem as fighting cocks. Haitian informants claimed that prospective fighters are put through a regime of toughening for combat, that may include chilling the birds in cold water, plucking neck feathers then rubbing the tender necks with lemon juice or alcohol, and staking the cocks out in the hot sun and depriving them of water.
Cock-fighting is a national past-time in Haiti, having diffused from the Roman world centuries ago via the Spanish. The cock fight is called the *gaquerre* or *bataille kok*. The price of admission is only about 50 kob or 10 cents, but the onlookers are expected to place wagers. This is an integral part of the country man's social life and liquor flows freely there. This writer once witnessed an impromptu bout on the seaside town rubbish dump of Port-de-Paix. Just like in the fairy tales, the small unpretentious underdog cock prevailed over the larger more impressive bird. The victorious bird ended up standing upon his prostrate foe and pulling off the opponent's artificial spurs, before the vanquished bird was rescued by the disgusted owner.

To appreciate fully the deep-seated place of the chicken in Haitian culture one can note its omnipresence in folklore. Once again one finds an animal of such familiarity to the rank and file of Haitians that it makes for a common character in country proverbs (McConnell and Swan 1945; Courlander 1960).

Avantage kok se zepron
(The cock's advantage lies in its spurs)

Ravet pa jam ge re'zon devan poul
(A cockroach is never in the right, when up against a hen)

Kan poul bwe dlo, li pa blie Bon Dié
(When the chicken drinks water, it doesn't forget to raise its head in thanks to God)
French cultural ecologist, Max Sorre (1948/1962: 400-1) emphasized the importance of understanding the present or forgotten religious roles of artifacts in the cultural landscape. In many world religion and belief systems chickens are prominent as objects of ceremonial sacrifice. All through Christian tradition, animal flesh was usually considered to be a more precious sacrifice than vegetable food, and the same relationship holds true in voodoo Haiti. Pragmatically speaking, in a land without refrigeration, the chicken makes a most convenient-sized "package" of meat. In fact, chicken is said to be the favorite food of the gate-keeper of all voodoo gods, Papa Legba, who is the analogue of St. Peter. If more pigs and goats are sold at times of the Christian holidays of Christmas and Easter (Coimin et al 1980: 2), then one might hypothesize an appreciable increase in chicken trade around voodoo holidays such as the feast of Papa Legba/St.Pierre (June 29), Ogoun Feraille/St.Jacques (July 25), or of Erzulie/Ste.Marie (August 15).

Hogs In Haiti:
Ups and Downs, Social Reverberations

Haitian farms are small-scale mixed farms, diffusing the risks of markets and environment over a diversity of enterprises. If agriculture is the means of employment best characterizing life in rural Haiti, perhaps peasant agriculture is in turn best characterized by the enterprise
of hog husbandry. Street (1960: 352) wrote that "the favorite investment" of a peasant livestock producer with extra cash was a brood sow. Yet, Haitian swine production in the past decade has suffered severe upheaval.

Hogs are among the most intelligent of all species of livestock, tolerant of a broad diet, and extremely prolific. Haitian creole hogs evolved into hardy creatures. They were modest in stature, and so lean and narrow that they were commonly called cochon planche—plank hogs—a moniker that brings to mind the "razor-backs" of the Southeastern U.S.A. The creole hogs were resilient and adaptable in the face of feed uncertainties. They developed a degree of natural resistance to many tropical pests. Their meat formed the basis of the national dish of Haiti, griot, deep-fried pieces of pork. In short, the hog represented a cherished element of not only Haiti's agricultural complex, but of society as a whole.

Who could have anticipated the tragedy of the late 1970s and early 1980s following the outbreak of African Swine Plague? Beginning in 1978, about two thirds of the national herd of 1.2 million were infected and killed directly by the disease. The horror for the small producers—ever near the margin of survival—persisted as their surviving hogs were exterminated by the government in an effort to rid the nation of all potential plague carriers.
Rumors raced through an angry nation. Haitians were sensitive to a history of abuse and exploitation in international affairs, as well as rampant ambition, conspiracy and deceit in domestic politics (Fortuné 1988; Plummer 1988; Flavien 1973). Could it be that foreigners introduced the disease in an insidious plot to increase economic dependency? Did the remaining hogs—seemingly healthy to the casual observer—really have to be killed? Were unfair exceptions made for the herds of those who wielded extra economic/political clout, the traditional manipulators of "the system." the gwo negs? These were the suspicions commonly voiced on the street in the mid-eighties.

After Haiti was certified as plague-free in 1984, it was time to begin a swine restocking program. Yet there came flying one more perceived insult, yet one more appearance of cultural insensitivity to a small nation, still tender from two centuries of dealings with large nations (Bellegarde-Smith 1985, Fortuné 1988). The replacement pigs would be big, exotic American hogs. There would be no more Caribbean creole pigs to which the common folk were accustomed. This substitution would have symbolic meaning even beyond the immediate repercussions.

At first the new pigs were doled out only to farmers who measured up in terms of the environment that they could provide: concrete-floored pens with shade, and guarantee of
feed supply, including the ability to purchase high-value concentrates such as imported soy meal. However, the American hogs grew to alarmingly huge proportions, requiring still more feed. The transplanted system of the American Midwest is to rapidly feed out young hogs to market size of about 200 lbs. in about half a year and then sell for slaughter. The Haitians were accustomed to holding the hogs for longer periods until needed for sale for cash, and feeding only as needed for maintenance. Street (1960: 353) had written that hogs might take 14 to 24 months to reach a slaughter weight of about 180 lbs.

Among the breeds imported into Haiti were the large white Yorkshires. Hogs of this breed are among the largest in the world—if fed generously, they may attain a weight of 1000 lbs., larger than a mature Jersey cow. If not fed high quality rations, such newcomer hogs failed to thrive in foraging for fodder of lesser quality, even though the Yorkshires and Hampshires are noted among North American hog breeds for higher degrees of foraging ability and maternal instinct (fig.28). Still less vigorous foragers are the Durocs and Poland Chinas also used in the repopulation program. These last two breeds are also lacking in mothering ability—less milk production, less care in accounting for all of their piglets, and indeed such criticism was leveled at swine of the repopulation program (Le Nouveliste, April 8, 28, 1986).
Fig. 28. Swine restocking program underway at a school in Jean-Rabel, Northwest Haiti. Notice the tell-tale shoulder stripe of the introduced Hampshire breed in these piglets.
The North American animal scientists meant well and they tried hard. If they insisted on concrete floors for their pigs, they knew of sanitation problems in the U.S.A., and feared worse in the tropics. They must have been anxious for their program of hog-raising to have the best possible chance of success, and they did it the way they knew how, expecting the Haitians to follow suit. Yet, rather than try to mold Haitians to the transplanted system of swine culture, someone might have asked what the Haitians expected for their own hog repopulation program and then tried to accommodate them.

The Haitians wanted *cochons planches, cochons noirs*. They wanted small hogs, good foragers, good mothers, tough in the presence of disease and no-frills sanitation, and dark hogs, pigmented for the tropical sun. The white and pink Yorkshires had problems here. But they were white hogs not only in the sense of hair color and sun-burn susceptibility, but also *cochons blancs* in a subtler but still more important sense. In Haitian Creole, the term "blanc" has two meanings: white, and foreign. Imagine the irony and confusion if the main breed used in the swine repopulation program had been the British "Large Black." Would it have been called a *cochon blanc*? As it turned out, the big white unacclimated Yorkshires allowed easy usage of the term with all of its nuances and connotations intact.
They were "blanc" as in "foreign," aliens whose presence was mandated from without, and resented by many Haitians.

The Haitian hog crisis has direct impact upon yet another area of Haitian culture, foodways and cuisine. The traditional national dish had been pork griot but that was virtually nonexistent for a time. A comparable scenario might be the U.S.A. passing a year without hamburgers. More goat and chicken were eaten in the interim until international market forces flowed into the vacuum and shipped frozen pork to upscale urban markets in Port-au-Prince. Then preliminary results of the repopulation program began to be felt within two years as the national herd had recovered to a point to allow some slaughtering.

Swine were again seen in the countryside, and consumers could once again serve pork. However, they said pork from the new pigs just did not "taste right." Is that a question of expectations? Perhaps, yet pork does have a decided tendency to take on different flavors and textures depending upon what feed was given the animal. For example, there are distinct differences between meat tastes from milk-fed, corn-fed, pastured, acorn-fed, or predominantly slop-fed hogs. Not only were the new animals of different breeds, with leaner carcasses, but as noted previously, a radically different diet was required for the introduced hogs. One might be more surprised if the new pork did not taste noticeably different from the old.
What were other cultural ramifications of the swine demise? Repopulation critics contended that actual school enrollments fell off as a direct result of loss of hog production (Le Nouveliste 4-28-86: 5). Just as the "butter and egg money" on North American farms was often kept as an account separate from the till of general production expenses, "hog money" in Haiti was often dedicated for school expenses such as tuition, uniforms, books and other supplies.

Critics have charged that the introduced piglets suffered an extremely high mortality rate and have been particularly susceptible to dysentery and diarrhea (Le Nouveliste, 4-28-86: 5). Most swine dysentery is of bacterial origin as is sow mastitis and leptospirosis, and thus treatable with antibiotics if only they were available to the peasant producer. But even the U.S.A. incurs an average piglet loss of 30 to 35% (Ensminger 1983: 783).

At the time Street (1960: 357-8) was writing thirty years ago. Haitian hogs were tormented by lice and mange mites and periodically buffeted by hog cholera. Diseases such as hog cholera and leptospirosis are more likely under conditions of crowding, and these would probably be even worse in Haiti if not for the traditional lack of large herds, and the dispersal of pigs into the usual twos and threes. Detractors of the repopulation program predicted increased incidence of disease if investment requirements of
the new program resulted in a larger proportion of the pigs going to larger herds of wealthier producers (Le Nouveliste 4-28-86: 7).

In a culmination of the criticism of the North American repopulation efforts, there began a later program to introduce other breeds of hogs, notably a French Gascon/Chinese cross, as well as Jamaican "Creole" hogs similar to those of Haiti. The inclusion of Chinese genes represents an alternative to the Yorkshire in an effort to increase the size of pig litters. The Chinese Tai-Hu is the most prolific swine breed in the world, with record litters of over 40 pigs versus the 10 or 12 of breeds of European origin.

As a generalization, Haiti has not had an outstanding region of swine specialty, unlike the dry Northwest with its relative emphasis on goats. Although, with hog carcasses being bulkier than those of goats, and pork somewhat riskier to preserve in the tropical heat, one might expect swine production to be intensified nearer larger urban markets. Accordingly, Street (1960: 353) claimed something of a swine production concentration on the Leogane plain, just west of Port-au-Prince. That area was again named in 1986 by an official of the restocking program, when asked what localities stood out as areas of noted hog activity (Mangones-DeJean, 4-15-86).
The Leogane plain would boast other advantages, in availability of sugar milling by-products, as well as feeds associated with rice, taro, and seaside coconuts and fish trimmings. A case might be made for identifying hog country in the extreme southwest end of the nation, the Grand Anse region, as there one finds relatively larger numbers of fruit trees such as mamey and breadfruit, with abundant fallen fruits ideal for hog foraging. In fact, Street (1960: 353) wrote that provision of hog food was once one of the very foremost reasons for planting fruit trees.

That there seems to be no clear hog specialty area of Haiti relates directly to the fact that there is no one major crop production region. Williamson and Payne (1978: 541) pointed out that "pigs are usually most numerous where human food is cheap and plentiful." A map of hog distribution in the U.S.A. shows its "hog belt" to be almost perfectly overlaid upon the "corn belt." Of course Haiti has no "cheap and plentiful" human food, no corn belt, and thus, no hog belt. However the omnivorous pig can be supported by a little of this, and a little of that, as suggested by the following feeds table compiled from many sources by the author.
Table 8. — Potential swine feeds

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRUITS</strong> - overripe, culls, and peelings</td>
<td>BANANA and PLANTAIN, AVOCADO, MANGO, CITRUS, KENEP (mamoncillo, &quot;Spanish lime&quot;), MAMEY, BREADFRUIT, PAPAYA, GUAVA, MELON D’EAU, MOMBIN (in English Caribbean - &quot;Hog Plum&quot;), BOIS CORNE (in English Caribbean - &quot;Hog-berry tree&quot;), SUCRIN, POIS DOUX - Inga vera, Inga laurina, GRENADIEN (Passiflora sp., granadilla), GRAIN PALMISTE - both the green pulpy mesocarp of the palm fruit and crunchable seeds as well</td>
</tr>
<tr>
<td><strong>GREENS</strong></td>
<td>PATATE (sweet potato) vine, MALANGA (Xanthosoma sp.) leaves</td>
</tr>
<tr>
<td><strong>FOOD PROCESSING BY-PRODUCTS</strong></td>
<td>RICE BRAN, CITRUS PULP, SPENT BREWER’S GRAIN, COCONUT MEAL, WHEY &amp; SOURED MILK, WHEAT SHORTS AND MIDDINGS, MOLASSES</td>
</tr>
<tr>
<td><strong>HIGH PROTEIN CONCENTRATES</strong></td>
<td>SOY MEAL, FISH MEAL</td>
</tr>
<tr>
<td><strong>PEAS AND BEANS</strong></td>
<td>ARACHIDE - peanut and peanut press cake, POIS KONGO - pigeon pea, POIS GUINEE/INCONNU - field pea, POIS CHEUSE - lima bean, POIS LENTILLE - also known as POIS MANGE COCHON</td>
</tr>
<tr>
<td><strong>MISCELLANEOUS</strong></td>
<td>MANIOC - sweet, fresh roots (not peelings) and dried chips, MIRLTON, YAM BEAN ROOTS - also called PATATE COCHON, POIS COCHON, GIRAUMONT (pumpkin, squash), PATATE LAN MER - in Puerto Rico translates as &quot;Hog vine&quot;</td>
</tr>
</tbody>
</table>
CHAPTER FIVE
EXPORT CROPS IN HAITI: MACROECONOMICS ON THE DOORSTEP

Coffee: The Troubles of the Leading Cash Crop

In Haiti, coffee has been called both "the great energizer of the economy, and "deadly present from Arabia" (Street 1960: 263; Moral 1955: 238). For good or ill, coffee has been the pre-eminent foreign exchange-earning commodity for the entire existence of independent Haiti, almost 200 years now. While various writers convey the impression that production at the peasant level has changed little over the course of decades, the industry as a whole recently has been sliding into a time of transition that bears closer examination here.

There have been excellent past studies of peasant coffee production in Haiti (Moral 1955, Street 1960, Girault (1981). The latter 1981 study by Girault was summarized by Weinstein and Segal (1984), and by Girault (1985). Additional insights are contributed by Lundahl (1979), and the comprehensive work of Wrigley (1988). Geographers might now investigate coffee in Haiti: 1) in the context of changing world patterns of production and trade, 2) to examine patterns of production and transport within Haiti, and 3) to examine evolving land use relationships in rural Haiti.

151
PRODUCTION REVIEW

What scenes are evoked by peasant coffee production? Firstly, coffee, *Coffea arabica*, is a perennial large shrub or small tree and is not grown in a crop field, but appears in a shaded ravine, at the fringes of an orchard or forest remnant, or in the *lakou* or homestead courtyard. It is somewhat exacting in its requirements for moisture and prefers a moderating shade canopy above. One may encounter coffee interplanted with annual food crops, but problems then result from competition for moisture and nitrogen, and from lack of sunlight for the annual crops. (figs. 29, 30)

Coffee is generally a crop of the uplands. It does not abide frosts, nor does it fare well in the heat and humidity of tropical lowlands. Thus it is most common in an elevational band between 300 and 1800 meters. It is grown lower, but there yields a poorer quality cherry and bean. It prefers a micro-climate further moderated by the partial shade of an overarching tree canopy. To bear fruit, coffee must find abundant soil moisture at least 8 to 10 months of the year and yet needs a soil with good drainage.

It thrives in a soil that is a meter deep in rooting zone, just slightly acid (a pH of 6.0 - 6.5), high in organic matter and not deficient in major mineral nutrients. The requirements of nurse shade and water certainly constrain the distribution of coffee in northwestern Haiti,
Fig. 29. Shade-tolerant polyculture typical of mid-elevation, windward slopes in eastern part of Northwest Haiti. Mounds in foreground are yams, *Dioscorea* sp., shrubs just behind are coffee. Foreground, right of center is a *malanga* of the aroid family, and background, left of center includes the deeply lobed leaves of the breadfruit tree, *Artocarpus altillis*. 
Fig. 30. More polyculture: predominantly banana or plantain, with a thick profusion of climbing yam vines just behind. Though not obvious here, this is prime coffee environment.
but once one moves upslope out of the arid lowlands, coffee plants can be found once again.

A Matter of Scale. The peasant producer in the Northwest will not have hectares of coffee, but a few plants of coffee. As previously argued in this work, American readers accustomed to modern US agribusiness with its hundreds of acres of a single crop are not likely to appreciate the small scale of enterprises, nor the importance of the diversity of enterprises on the Haitian farm. These two characteristics are of critical importance in the production of Haiti's premier commodity, coffee.

With a mean farm size of 1.4 hectares per farm, the subject is distorted by the small number of medium scale farmers—10% of all farmers—with 40% of the land, while about 560,000 farmers divided the remaining 520,000 hectares (Maguire 1979: 13).

However, the figures given above are for total farm size, and coffee is likely to be only one of many necessary enterprises for the diversified peasant farmer. The coffee grower may be compared with an East Tennessee tobacco farmer who derives the major part of his total income from burley tobacco, although his "backer patch" is likely to occupy less than one fourth of an acre, on a 100-acre farm. Similarly, a peasant family in Northwestern Haiti who

---

20 Since the 1971 census used by Maguire, the total national population has increased from less than 4 million to over 6 million.
anticipates the coffee harvest with keen eagerness, may do well to harvest from 100 bushes, a grove of perhaps 1/16 acre or .03 ha in a shaded corner of their homestead beneath their mango trees, or a small portion of an outlying field or ravine at higher elevation. From that number of bushes, they would get perhaps 100 lbs of berries. They would net about 20 lbs of green coffee beans, or about 4 gros marmite (roughly, a 5-lb tin) worth a total sum of perhaps $5, a tenth of their annual income.

On a reconnaissance traverse across morne (mountain) Haut Piton, this writer noted well-shaded coffee shrubs within a few feet of sea level on the north coast just east of La Pointe. Moving upslope, little other coffee could be found on the drier hillsides until about 300 m elevation just below the crossroads of La Croix. There coffee was common in what Moral termed the maquis caffière, a thicket surrounding yam mounds and overshadowed by bananas, sucrin and pois doux. Near elevations of 800 or 900 m approaching the crest on the cloudy windward face of the ridge, coffee plots were readily apparent, with little or no shade. Yet at the same elevation on the sunnier southwest side of the ridge, this writer at first observed no coffee. Then guides pointed out a wetter ravine with taller vegetation and gave the assurance that coffee was "over there under those trees."
Goodland et al. (1984: 36-8) suggested appropriate management practices include attention to proper shading, mulching, weed control, and management of pests such as leaf rust. The Haitian peasant has generally kept his coffee reasonably well shaded, and has been blessed with relatively little coffee pest damage with the exception of rodent predation (Street 1960: 253; Girault 1985: planche 14). He has been less attentive to mulching and completeness of weed control, but he may justifiably claim the labor expenditures involved there would not be cost effective.

Shading. Except for coffee at the highest elevations, almost all Haitian coffee is overshadowed by still higher trees (Street 1960: 251-252). Wrigley (1988: 154-5) pointed out that shading not only lowers maximum temperatures, but also significantly raises minimum temperatures, perhaps by as much as 4-5 degrees C. Table 9 summarizes the most common coffee shade trees observed by this writer in Northwest Haiti near Port-de-Paix.

Mulching. Mulching boasts many advantages over interplanted cover crops in retaining soil moisture, suppressing weeds, conserving topsoil and contributing organic matter and nutrients (Wrigley 1988: 155-63). However, in Haiti today the fodder needs of livestock on the peasant habitation constitute a much more urgent claim for any crop residue.
### Table 9. — Common coffee shade trees

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SUCRIN (guama)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Inga vera</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOMBIN (hog plum)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Spondias mombin</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ZABOKA (avocado)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Persia americana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARBRE VERITAB (breadfruit)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Artocarpus altilis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MANGUIER (mango)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mangifera indica</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POIS DOUX (guama)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inga laurina</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOIS CHENE (Antillian “oak”)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Catalpa longissima</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHADEQUE (Shaddock)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Citrus maxima</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pruning. Coste (1961: 601) and Girault (1985: section I.D) refer to the virtual "absence de taille," or lack of pruning despite efforts of government agronomists. Lack of pruning permits voluntary sprouting of suckers that dissipate nutrients from the roots among nonproductive stems, and leads to the tangled thickets to which Moral (1955) alluded. Conversely, pruning allows a more productive concentration of photosynthates, opens up the tree canopy and lets more sunlight reach more leaf surface area, and allows freer circulation of air, for faster drying and less susceptibility to disease (Wrigley 1988: 150).

Fertilizer. Wrigley (1988: 284-97) wrote that phosphorous supply is most critical for young coffee plants. Nitrogen is more critical with competing plants that are intercropped with coffee, although nurse trees in Haiti may be nitrogen-fixing legumes such as the pois doux and sucrin. Potassium could be supplied by manure or by wood ashes. Other critically limited minerals might include calcium, magnesium and zinc, but Girault (1985: planche 14, I.D.) stated that fertilizer, natural or chemical, is practically not utilized in Haitian coffee farming.²¹

²¹One must note, however, the campaign of the late 1970s to provide chemical fertilizer to coffee farmers. Indications are that this program was less than a full success. A more detailed discussion follows near the end of this section.
Improved varieties. Street (1960: 250-1) discussed two varieties with significant differences, the old colonial typica and the introduced Bourbon. He also acknowledged government promotion efforts. Girault (1985: section I.A) wrote that there have been attempts to introduce better-yielding varieties, but that they have only encountered little success, and the typica variety prevailed. Wrigley (1988: 394) pointed out that breeding experiments for any fruiting tree crops such as coffee take many years to bear results. This long-term time commitment ties up skilled personnel, land, and budgeted funding. Wrigley (1988) also noted that the primary correlate of maximizing yield is overall plant health and vigor. The primary health concern for coffee plants worldwide is probably control of CLR—Coffee Leaf Rust, in French known as rouille.

When Street (1960) and Coste (1961) wrote on Haitian coffee, CLR fungus was not a problem in Haiti. Girault (1985) did not mention it in his summary. However Wrigley (1988: 316) wrote that CLR began spreading rapidly through Latin America after 1970, and was first identified in Cuba and Jamaica in 1986. If this fungus was not a problem in the past in Haiti, it can be expected to make a severe impact in years to come. While the most rust-resistant new coffee varieties sacrifice something—foregoing maximum yields, or cup quality—they are still valuable in rust-prone areas, even when not completely resistant to all races.
of CLR. Wrigley (1988) noted that varieties with some degree of resistance respond considerably better to fungicide spraying than do non-resistant varieties.

New plantings. Street (1960: 247-8) wrote about government support of new coffee plantings in the forties and fifties, but Girault (1985) did not indicate the practice was common in recent years. Wilentz (1990: 264-7, 276-8) and others have discussed recent reforestation campaigns, but these generally emphasize not coffee, but leguminous species for soil conservation and fuelwood. Young coffee plants do not begin bearing for about three years, and do not begin vigorous production for about five years. Without guaranteed future access to the land presently worked, the tenant peasant is no more likely to invest in fresh plantings of slow-to-yield coffee than in fruit trees, fuelwood, or long-term soil amendments.

Yields. In attempting to ascertain yield figures, care must be exercised, especially when working with national figures. Mean yield figures reported for Haiti are consistently in the 900-1100 kg/ha range, well above a world average closer to 500 kg/ha (FAO 1988: 78). Pieterse and Silvis (1988: 9) cited figures for Haiti of an entirely different magnitude: 300 kg/ha. Street (1960: 254) noted 500 kg per carreau in the Cayes area, which would work out to about 375 kg/ha. There is an expected, regular alternation between good crops and lean crops (Street 1960:
253), but harvests can be disastrously reduced by drought or hurricane damage.

**Harvesting, Processing, Quality Control.** Harvesting is labor-intensive, and generally proceeds from lowlands to later-maturing uplands. Street (1960: 253) gave an adequate summary of harvesting. This activity was and is important enough in Haitian rural life that Street (263-4) noted that the non-harvest season—February - July—is termed "the dead season."

Spanning three decades, the sources consulted here are quite consistent as to the proportion of Haitian coffee that is processed by the dry method, with 80 to 90% processed by sun drying in the cherry and then depulping by mortar. The remainder is washed in wet process mills, usually giving a higher quality product.

Some coffee grown under austere conditions—common Ethiopian, for example—maintains a reasonably good reputation for flavor and some degree of quality. What might be reasons that Haitian coffee would be penalized or discounted at the various stations in the marketing chain?

1.—small beans, because of genetic limitations of the variety
2.—small beans, because of stripping the branch of all beans, including immature ones
3.—broken beans
4.—moisture-darkened beans
5.—beans with parchment removed too soon
6.—beans depulped from green (undried) cherries, "tiocage"

It is important to note that the Haitian producer would have little or no reason to expend greater care and energy in achieving higher quality if there is no premium paid for higher quality beans, and there usually is not.

THE COFFEE MARKET: LOCAL AND GLOBAL

Producers in the edge of the Northwest, for example in the upper La Plate watershed above Bassin Bleu, would appear to have a number of market outlets. They could go upstream to the crossroads town of Gros Mornes which boasts a pulping mill. They could carry coffee down to Chansolme, or even farther to the regional capital of Port-de-Paix. To the northeast, on the wetter windward slopes surrounding St.Louis du Nord, is still better coffee-producing country with proportionately more facilities for processing and marketing.

Producers appear to have these options, but in reality one is likely to be constrained by indebtedness and standing obligations to trade through the creditor, a businessman of multiple roles that include coffee speculation in addition to money-lending. The peasant becomes a price-taker. No premium is received for superior mountain-grown beans.
Most consumers in a free-market capitalist economy are familiar with the concept of *monopoly*, where a single producer is able to gain a major share of a given market, which enables him to exert a disproportionate influence upon prices. A variation on this concept is *oligopoly* where a small number of producers with common pecuniary interests are able to behave in a concerted manner—if not in outright collusion—to manipulate the market price of their commodity.

The same effect is achieved by domination on the other side of the market, when consumer demand remains high, but intermediary buyers are few relative to sellers, and producers are relegated to becoming "price takers." This situation, termed an *oligopsony*, prevails for Haiti's most important export commodity, coffee. Christian Girault (1985 planche 14, II.B.) has highlighted the favored position of the few houses of *spéculateurs* or wholesaler/exporters who buy most of Haiti's green coffee beans each winter. In virtually every year, over 40% of the market is dominated by only three firms; another 40% by eight medium-sized firms, and the remainder of the market—about 17%—fought over by another 18 small houses.

**Marketing Cooperatives.** Efforts to break out of these confining relationships are best exemplified by the rise of direct-marketing cooperatives (Girault 1985: III.B.; Maguire 1979 and 1989; Wilentz 1989: 257-9). Maguire (1989) gave a
thorough characterization of the general rise of grassroots peasant movements in the 1970s and 1980s—and of the opposition that such movements face. This writer met enthusiastic youthful officers of a newly-formed coffee cooperative south of Jean-Rabel in mid-1986. One year later that very neighborhood was rocked by backlash against populist reform, class friction and fratricide. The fate of the cooperative encountered by this writer is unknown. Wilentz (1989: 257) may have understated the outcome when she wrote that the "massacre of Jean-Rabel effectively put an end to the cooperative ventures of the peasants there."

International Competition. For many decades, coffee has been the most valuable export commodity for Haiti, by far. Yet coffee is now one of the most valuable internationally-traded commodities for the entire world, and Haiti is now only one of many countries—about 50—that are significant coffee producers. This vigorous trade is characterized by undercurrents of vicious competition between producing nations, periodically restrained by international producers agreements.

On the eve of the French Revolution, Haiti, "the pearl of the Antilles," was the largest supplier of coffee to Europe. Over the next century Haiti's production declined as production soared in other lands such as Brazil (Wrigley 1988: 49). Haiti has seen its position slip further from supplying about 2% of the internationally-traded coffee
early in the twentieth century, to 1.5% circa 1950, to just
tless than 1% circa 1960, to about 0.5% in the late 1980s.

One may argue that market share percentages are
relative figures and largely reflect the steady growth in
world coffee consumption. However, as Haiti’s share has
slipped, that of other countries has increased.

Haiti’s Loss, Central Africa’s Gain? Looking at the
major destinations of Haitian coffee exports, one can piece
together something of why Haiti has been vulnerable to
displacement in the world market. Figure 2 shows that the
U.S.A.—by far the world’s largest coffee-consuming country
—has consistently received a substantial portion of Haitian
exports: just over 27% in the late 1950s and just over 27%
in the late 1970s. However, over twice this share was sent
to the combination of France, Italy and Belgium—about 60%
in each period (see pie chart, fig.31).

Germany, France and Italy follow the U.S.A. as the
world’s next largest coffee-consuming nations. It is
important to recognize that different national coffee
consumption preferences have substantial bearing on the
source of each country’s coffee. The much darker roasted
coffee favored by the French and Italians leads to the use
of Haitian beans, as they are reputed to retain their flavor
during prolonged roasting (Mwandha et al 1985; Wrigley 1988:
496). The French custom of taking coffee with milk combined
with the darker roasting allows usage of cheaper coffee.
Fig. 31. Importers of Haitian coffee. Sources: data from Coste (1961), Girault (1985).
whether the lower grade unwashed arabicas of Haiti, or the inferior robusta of West African countries. A much higher percentage of robusta coffee is imported by Italy and France than by Northern European countries.

Much of the world robusta production comes from lowland nations of Africa, the continent undergoing most rapid growth in coffee production. Shifting emphasis by the French to imports of African coffee in recent decades is no coincidence, but explicit policy. In the economic rebuilding following World War II, France, like each of the other European colonial powers, strove to trade within its own colonial system, imposing an additional tariff on Latin American coffee, while importing from West Africa duty-free (Pieterse and Silvis 1988: 59).

By 1985, the Ivory Coast supplied the largest share of all French coffee imports—27% (Pieterse and Silvis 1988: 35). Ivorian coffee is virtually all robusta. In the 1960s about half of all Ivorian coffee went to France, as did about one third of it in the 1970s (Lucier 1988: 277–8). The major arabica producing nation of formerly French West Africa is Cameroun, whose foremost trading partner today is France. Cameroun produces about four times as much coffee as Haiti, from predominantly younger plantings, of superior arabica cultivars such as "Blue Mountain," and more of it is "mountain-grown" (Wrigley 1988: 53).
Those countries, though larger than Haiti, serve to illustrate the changing market picture of supplying coffee to the major importers, and Haiti's decreased role therein. This process can also be illustrated with two countries closer in size to Haiti, Burundi and Rwanda. Table 10. shows all three to be of comparable area and population. While these two nations are Central African and not West African, they yet maintain strong trade ties with the nation with whom they once had virtual colonial status. In this case, Belgium was the European affiliate, and Belgium has traditionally been one of the "big three" European customers for Haitian coffee as well.

Haiti would be at a disadvantage to Burundi and Rwanda, left out of any post-colonial preferential relations between these countries and Belgium. Haiti would have other disadvantages as well. Firstly, coffee from Burundi and Rwanda is virtually all "mountain-grown," and described by Wrigley (1988: 497) as "excellent washed arabicas ... highly acid and full-bodied, yielding a rich dark brew with a strong flavor." Secondly, as much as Haiti depends heavily upon coffee exports for its national livelihood—34% of GDP

Why not compare Haiti with other Caribbean coffee producers such as Jamaica? The neighboring countries do not compete with Haiti for the same coffee importer markets such as France, Belgium and Italy. Haiti has traditional francophone ties with France and Belgium, and its largely unwashed arabica coffee goes primarily for dark roasting. Jamaica produces mostly washed arabicas which rank among the world's highest quality coffees, and much of its Blue Mountain coffee is shipped to Japan.
<table>
<thead>
<tr>
<th></th>
<th>Haiti</th>
<th>Burundi</th>
<th>Rwanda</th>
<th>B + R</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POPULATION</strong></td>
<td>6.4</td>
<td>5.3</td>
<td>6.9</td>
<td></td>
</tr>
<tr>
<td>(1989, millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AREA</strong></td>
<td>10,700</td>
<td>10,800</td>
<td>10,200</td>
<td></td>
</tr>
<tr>
<td>(square miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1950</strong></td>
<td>1.5</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>percentage of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>world coffee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1961</strong></td>
<td>0.8</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>percentage of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>world coffee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1979–81</strong></td>
<td>0.74</td>
<td>0.57</td>
<td>0.44</td>
<td>1.01</td>
</tr>
<tr>
<td>avg. share of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>world coffee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1987–89</strong></td>
<td>0.54</td>
<td>0.62</td>
<td>0.67</td>
<td>1.29</td>
</tr>
<tr>
<td>avg. share of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>world coffee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

the degree of dependency upon coffee is even greater in Rwanda (53%), and Burundi (85%) (Lucier 1988: 312). While the rivalry between these two African nations and Haiti, all minor producers, is not obvious, its de facto existence characterizes the trends of the past decade of an increasingly troubled Haitian coffee industry contrasted with that of its vigorous newer competitors.

In addition, Haiti's level of exports has fallen not just relative to others', but in absolute measures as well. Cause and effect appear to be rather tangled here, but various scholars provided foreshadowings of what was to come in the late eighties (Moral 1955: 256; Street 1961: 263; Girault 1985: section III.C).

The 1986 World Development Report of the World Bank (1986: 79) stated that Haitian coffee trees were being uprooted and replaced with food crops. At first glance this claim appears counter-intuitive. Why would farmers forego their prime source of cash income? One might juxtapose, however, a succession of events, both domestic and international.

1. Coffee played out in some areas of Haiti—les Mornes Noires, Chaine des Matheux, the slopes around Port-au-Prince—by the early decades of this century. Contributing factors included removal of shading trees from above, and erosion of hillside topsoil from below. It is reasonable to suppose this process continues in other regions, given the
ever-hungering goat and the charcoal cooking fire (Moral 1961: 272-4; Street 1960: 263; Girault 1985: I.B).

2. Are we now witnessing the senescence of a generation of coffee plantings dating from the 1940s and 1950s? The active bearing life of a coffee tree is about 30 years, (up to 50, at most). Street (1960: 251) said Bourbon, the most common alternative variety had an even shorter bearing life. He (1960: 247) implied that Haiti's greatest push for new plantings may have been during the string of years of unusually high selling price in the early to mid-1950s, especially 1953. Thirty years later, the World Bank began writing of uprooted coffee shrubs. The essence of FAO data, rough as it is, may be corroborating this trend, as it indicates national yield average of 1987-89 was only about 80% of that of 1979-81, but these figures may also be reflecting the appearance of Coffee Leaf Rust.

3. The explanation for the replacement of coffee given in the World Bank report emphasized the higher value of foodstuffs relative to cash crops. Street (1960: 260,263) noted some coffee to food crop transition over thirty years ago. Lundahl (1979: 216-20) gave a clearer elaboration when he compared a series of mean food crop prices with those of export crops including coffee, and concluded that the former were gaining in value relative to the latter. Additional urgency was sounded regarding food shortages and rising
prices to consumers in papers by Girault and Douzant (1989) and Augelli (1985).

4. A few years ago the International Coffee Organization initiated "diversification" programs: formal incentive programs to encourage the shifting of marginal coffee producers into alternative enterprises. These were later discontinued during periods of Brazilian crop shortfalls, and associated higher prices. During the ICO diversification years, were Haitian producers actively coaxed out of business by this program?

5. In a coffee improvement program of the late 1970s, USAID made available 14,000 tons of fertilizer, presumably for small coffee growers. It is now apparent that medium-sized producers usurped the greatest part of the fertilizer aid and thereby reaped more capital for additional investments in local coffee production. A secondary component of the program involved construction of "penetrating roads" intended to provide greater market access—but for whom? The minority of Haitian business people who own trucks benefit greatly. The majority who walk and carry produce or use pack donkeys, derive much less direct benefit from the roads (Girault 1985: sect.IIIC.; Maguire 1979: 24-6). Did greater disparities between large and small producers ironically result from attempts to help the small? Was there a resulting net loss of coffee producers?
6. If all of these factors are not sufficient to drive the farmer out of production, it may well be that the coupling of events of 1987 were. In 1986, the world's largest coffee producer, Brazil was staggered by severe droughts. World supply was seriously affected—or appeared to be through futures speculation—so that coffee prices sky-rocketed, and the International Coffee Agreement, with its restricting quotas, was suspended. Unfortunately, Haiti was not able to take full advantage of the wide open market share free-for-all that year, as they suffered one of their occasional short crops with production down to 30,000 metric tons (MT), significantly below the usual 34-36,000 MT level of recent previous years. Yet the remainder of world producers reaped an all-time record harvest with corresponding lower prices for everybody. Haitians experienced the farmer's nightmare: the rare coupling of depressed prices and a scanty harvest.

SUMMARY

In brief, one now finds indications that 1) Haitian coffee shrubs are diminishing in yields with total national output trending lower, 2) yet international coffee production growing faster than consumption, despite controls, resulting in lower prices offered to Haitian growers, and 3) former coffee hectarage is now given over to food crop production. 4) It would not be surprising to find
erstwhile coffee farmers giving up altogether, and joining the migration towards the primate city, Port-au-Prince. Yet all of this malaise is borne by Haiti's traditional leading commercial crop and main source of foreign exchange.\footnote{Most of these dramatic changes have occurred in the past decade, well after the excellent studies of Moral (1955), Street (1960), and Girault (1981, 1985). In spite of that, each of these writers gave foreshadowings of future problems in the Haitian coffee industry.}

Haiti's Sugar Cane Industry: From "One of Its Principal Riches," To "Almost Complete Collapse"

Upon the author's arrival in Haiti in 1987, friends rushed to report the latest news: HASCO had just been closed down. The full import of that news was appreciated sometime later. The Haitian American Sugar Company had been in business since 1915 and was the single largest employer in all of Haiti \((\text{Haiti News} \text{ summer 1987: 2; Abbott 1988: 344; MacDonald 1991: 130,132})\). The misfortunes of Haiti's sugar cane industry parallel those of the coffee industry in terms of sheer bad luck as well as intense competition and national interest manipulations within the international market. The industry has gone from what Houry and Pirovano \((1973: 109)\) called "one of Haiti's principal riches," to what MacDonald \((1991: 127)\) termed "almost to the point of a complete collapse."

Prior to the French and Haitian Revolutions, Haiti was one of the world's leading sugar producers. But the less
labor-intensive coffee became relatively more important in Haiti in the first decades after Haitian independence in the early 1800s. Yet over the next century, sugar retained a place in Haiti's exports. While coffee was a product of small farms in the cooler uplands, sugar cane was generally raised on larger holdings, on some of the best lands of the Leogane Plain, the Plain du Nord, and the Cul de Sac valley just north of Port-au-Prince. Although sugar cane played a major role in Haiti's national economy, it was not a major crop in the parched Northwest.

In the 1930s and 1940s, sugar climbed into the 10-15% range of Haiti's total export value (Moral 1961: 260). This was no insignificant amount, particularly considering the value-adding of processing cane into refined sugar, molasses, and especially, world-renowned rum. In 1960, sugar accounted for about 12% of Haiti's exports and in 1967 it was again 12% (MacDonald 1991: 129; Houry and Pirovano 1973: 109).

By 1970, however, pressures of international competition were beginning to take their toll and the main centrale or sugar mill serving the northern plain of Haiti closed down. MacDonald and Fauriol (1991: 6) wrote that a period of dramatically rising sugar prices from 1971 to 1974, coupled with the shocks dealt out by the founding of the OPEC petroleum cartel, alarmed Anglo-America and Europe
enough to spur rapid developments in beet sugar production and in alternative sweeteners such as corn syrup.

International regulation of the sugar market was not a new phenomenon in the 1970s. Decades earlier, Carl Sauer (1954: 23) wrote of cane sugar, "No other commodity has been entangled so long and so deeply in mercantilistic controls and manipulations." But during the mid-1970s, the clamor of international negotiations between countries with a stake in sugar reached a more feverish pitch. Sugar exporters and sugar importers, all jockeyed to gain maximum advantage in bilateral and multilateral trade agreements. In 1977, 70 nations signed the International Sugar Agreement (ISA). Between 1967 and 1974, sugar's share of Haitian exports had fallen from 12% to 9% (MacDonald 1991: 129). Although sugar's relative decline does not take into account a relative rise in other sectors of the overall economy, there were serious problems within the sugar cane industry itself. These figures bore dark foreshadowings for Haitian sugar.

In 1977, Haiti became a net importer of sugar. In the late seventies, countries of the European Community had built up their own sugar production to "major producer" status (MacDonald and Fauriol 1991: 4). Countries that formerly supplied Europe now competed with smaller producers like Haiti for other markets. The years of 1979-81 saw a world boom in sugar supply. In the farm bills of 1981 and 1985, the U.S.A. managed to get a quota system reestablished
for sugar imports, in part to protect its own industries of cane sugar, beet sugar, and corn sweeteners. When the ISA expired in 1985, it was not renewed. Through all of these developments, international scrambling for world sugar market share became increasingly desperate.

Haiti's next-door neighbor, the Dominican Republic, is an even larger sugar cane producer than Haiti. As it faced increasing difficulties with marketing its own production, its cheaper surplus sugar began filtering across the Haitian border as contraband. This was enough to hurt the struggling Haitian producers but not enough to rescue the larger Dominican industry. Problems on the Dominican side again hurt the Haitian economy as thousands of migrant Haitian cane cutters lost of jobs or faced worsened working conditions in the Dominican Republic. Ever with an eye for golden eggs, Duvalierist officials in Haiti may have dealt their sugar goose its death blow when they erected the INSD national sugar mill to compete with the then struggling HASCO mill, to permit more easily the skimming of graft from Haitian sugar profits (MacDonald 1991: 130-32).

By 1980, sugar made up only 2.2% of Haiti's exports. In 1983, the figure was 0.9%. In 1985, no sugar was exported (MacDonald 1991: 131). On the 7th of February, 1986, "President for Life" Jean-Claude Duvalier responded to increasingly tempestuous street protests and fled Haiti, bound for exile on the French Riviera.
Citrus: Unrealized Export Potential?

Why citrus? Earlier chapters in this work looked backwards at traditional food crops and livestock enterprises as separate pieces of the agro-ecosystem. The ending sections encourage a search forward through the smoke of present turmoil for rural development alternatives. Where does citrus fit in Haiti's past and future?

Citrus crops in Haiti may be examined as 1) contrasting traditional subsistence and domestic commercial, 2) tracing a century of citrus exports, and 3) evaluating emerging alternative export prospects. Though not a staple food crop, citrus has significance in addressing the real core problems of hunger and poverty in Haiti: not lack of food production, but lack of wealth at either the household scale or at the national scale. For economic development at either level, additional rural industries are desperately needed.

Various species of citrus fruits have been significant components of Haitian rural subsistence since the formative days of modern Haitian society over three centuries ago. Street (1960: 270) identified eight species of citrus fruits in Haiti in the early sixties, and divided these into four widely known species and four relatively less common ones, all listed in the following table.

Of these citrus fruits, the sweet or common orange is by far the most common. It is most important for fresh
Table 11. — Citrus Fruits of Haiti

<table>
<thead>
<tr>
<th>Common name</th>
<th>Creole name</th>
<th>Scientific name</th>
<th>main use: (table or industrial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sweet orange</td>
<td>zorange</td>
<td><em>Citrus sinensis</em></td>
<td>T</td>
</tr>
<tr>
<td>(common orange)</td>
<td>douce</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Lime</td>
<td>citron, calmouc</td>
<td><em>C. aurantifolia</em></td>
<td>I</td>
</tr>
<tr>
<td>3. Shaddock (pummelo)</td>
<td>chadeque</td>
<td><em>C. grandis</em></td>
<td>T</td>
</tr>
<tr>
<td>4. Sweet lemon</td>
<td>limon douce</td>
<td><em>C. limon, var. dulcis</em></td>
<td>T</td>
</tr>
<tr>
<td>5. Tangerine</td>
<td>calmouc, mandarine</td>
<td><em>C. reticulata</em></td>
<td>T</td>
</tr>
<tr>
<td>6. sour orange</td>
<td>zorange sur,</td>
<td><em>C. aurantium</em></td>
<td>T/I</td>
</tr>
<tr>
<td>bitter orange</td>
<td>bigarade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. bergamot</td>
<td>bergamote</td>
<td><em>C. aurantium</em></td>
<td>I</td>
</tr>
<tr>
<td>8. citrange</td>
<td>citrange</td>
<td><em>C. aurantium or</em></td>
<td>I</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>C. sinensis X</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Poncirus trifoliata</em></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Street (1960: 270); Pierre-Noel (1971); Schery (1972: 269-70, 555-60); Tasaki and Bond (1985: 26-43).
consumption and therefore is marketed locally. The second citrus fruit for fresh consumption at the Haitian table would be the pummelo, *Citrus grandis*, or shaddock, Frenchified into *chadègue*. Well behind that in importance would be lemon and tangerine.

The *chadègue* is the most visually striking citrus fruit marketed along the streets of Port-au-Prince. They have the appearance of large luscious grapefruit, and they have a pleasant flavor, but so much of the fruit is spongy peel, that the peel is salvaged and made into conserves (Street 1960: 271). The closely-related true grapefruit, *C. paradisi*, bears greater value as an export commodity. Not only is it not very tolerant of North American frosts, but it actually needs hot weather for its fruit to reach maturity. This is especially true for the pigmented "ruby" varieties. But the *chadègue*, the close relative and probable progenitor of grapefruit, has heretofore been more prominent in Haiti. It has climate requirements similar to those of grapefruit. Its much thicker peeling might be an asset in rough handling and shipping. California horticulturalists have developed a hybrid between shaddock and grapefruit, "Oroblanco" that is very juicy and sweet. Other true grapefruit varieties, such as Marsh, hold better on the tree and have superior storage capability, and thereby would offer greater promise for export to the US market (Tasaki and Bond 1985: 32).
Citrus fruits are easily discernable in the rural landscape of Haiti today. Even the most modest homesteads in the Northwest feature spirals of peel drying on wooden screens. Moral (1961: 315) also noted peasants selling dried citrus peel and commented on the dispersed nature of the industry which he termed "anarchique". He described the development of the export industry dating from the late Nineteenth century and wrote that most of the product went to France for liqueurs of the "curaçao" type. Thirty years later, Bourdet and Lundahl (1991: 39) observed that almost all of the bitter orange oil exported by Haiti went to the French manufacturers of the liqueur Cointreau.

Limes are valued as flavorings in punches and in mixed drinks and, like the juice of the bitter orange, in marinades for boucané meat. Haitian folk tradition holds that lime juice has antiseptic qualities and is even thought to turn bad water to good. However, the characteristic that most sets the lime apart from other Haitian citrus fruits is its very prominent role in the essential oil export industry.

Bourdet and Lundahl (1991: 39) noted that Haiti is the world's second largest producer of lime oil—a far cry from their standing among coffee exporters, although the world lime oil market is much smaller. Tables of FAO (1989: 214) data suggest that Haiti produces almost as much limes as oranges, while other Middle American citrus producers
usually grow several times as many oranges as limes. Other citrus products figure in the export of essential oils: neroli from orange blossoms, and rind oil from the bitter or sour orange, *C. aurantium*, and bergamot oranges, *C. aurantium bergamia* (Moral 1961: 315; Bourdet and Lundahl 1991: 36-39).

Given that coffee has been Haiti's bellwether commercial commodity for many decades, and given that its current status becomes relatively problematic with over 50 competing producer nations, plans for a strengthened economy would reasonably include a search for near future alternative enterprises. Haiti's natural resource base, though much degraded, is yet capable of supporting high value tropical agriculture. Haiti still has some topsoil, it still has agronomists committed to raising their families in Haiti, and perhaps most importantly, it boasts a vigorous spirit of petty capitalism that is perhaps equalled, but not surpassed elsewhere in the Americas. Given: 1) the proximity of the world's largest market of consumers, the U.S.A., and 2) the contrast between that market's upward trends in food consumption, versus its shortcomings in food production from its tropical fringe, one might conclude that citrus fruit exports could very well command a prominent place in Haiti's economic future.

Marc Bazin, a major candidate in the presidential campaign of 1986/87, stated that his economic plan for Haiti
would be as follows: 1. agriculture, 2. agriculture, and 3. agriculture (DuCasse 1986: 4). He declared that he would focus particularly upon the enterprises where he thought Haiti had a comparative advantage vis-à-vis rival producing nations. However, he may have faltered in his identification of which crops constitute advantaged commodities—maize, rice and sugar cane, coffee and bananas—and was taken to task by the Haitian agronomist Joel Ducasse (1986: 4-5), in an article titled, "Quelle agriculture?," or "What Agriculture?".

Ducasse (1986: 4-5) pointed out Haiti's relatively minor place in the competitive world market of all five crops, and that four of the five were lowland crops, with Haiti primarily an upland country. He recognized that there may be some limited comparative advantage for coffee and bananas, but counter-proposed other higher-value produce commodities such as tomatoes and tobacco.

In the same year of 1986, a spokesman for the Haitian Association of Agricultural Producers emphasized opportunities arising from the Caribbean Basin Initiative program, and noted a flurry of activity by Haitian agribusinessmen towards exporting fresh vegetables such as tomatoes, squash, peppers, and tropical fruits such as mango, pineapple, coconut, and citrus fruits (Haiti Times
His point was illustrated in the very same issue of that publication, with a news item noting recent investment in 5000 acres of citrus groves and vertically-integrated processing facilities in northern Haiti, under the name of "Arawak Groves" (Haiti Times 1/15/86: 3). While 5000 acres is a small fraction of Florida's citrus area, the project was expected to employ 2000 workers permanently, and yet again that many as seasonal laborers.

Investment in such ventures illustrates a phenomenon of offshore expansion of North American businesses which want to take advantage of favorable "import" terms for products brought across U.S. borders, even though the operations are usually owned by U.S. citizens. Much of the American public might be surprised to hear of the investment of U.S. dollars in tomato farms in the Bahamas. In addition to the tariff evasion advantages, such ventures give a hedge against environmental risks such as the freezes that devastated fruit and vegetable farms in Florida between 1981 and 1985.

Brey (1987) examined the freeze hazard in Florida for the period 1965-1985 and found that 1) Florida citrus production has shifted southwards to below the latitude of Tampa Bay, and 2) during this period, underwent a net loss

---

The CBI was supposed to be a regional development program for neighboring countries in the West Indies, bolstering economies and symbolizing American goodwill in the face of perceived communist threat in the early years of the Reagan presidency. As that threat has waned by all estimates a decade later, the renewal of the CBI program in its initial form is open to question.
of over 200,000 acres from production. The buffeting of natural hazards register in the statistics of production and to a lesser extent in consumption.

Is there a window of opportunity for increasing fruit exports from the West Indies to the great mass of consumers in the U.S.A.? Total U.S. production of oranges has failed to thrive, registering 9.5 million metric tons in 1979-81, and only 8.1 million in 1989. During the same decade, Brazilian production rose from 10.2 million to 16.8 million metric tons, or from roughly equal to U.S. production to almost twice the U.S. production and not surprisingly, half of Minute Maid frozen orange juice is said to be from Brazilian concentrate. While Brazil boasts an established network of marketing structures and can take advantage of economies of scale, other countries also want to get into the business. Mexican exports of citrus products to the U.S.A. have doubled in the last five years and rumblings are heard from Florida producers, uncomfortable with the mounting competition (FAO 1989: 214-7; McNair 1991: 5B).

Meanwhile U.S. citrus consumption per capita has held steady, with only slight deviations each year from a 25 lb. per capita level. However, total citrus product consumption has increased in step with population increase. Haitian businessmen are aware of opportunities here. While they cannot equal the scale of operations of those of larger
countries, might they claim an intervening opportunity in terms of proximity to market and lower shipping costs?

One final caveat ought to be included here, regarding the prospects for long-term investment in orchards and in processing factories, as Haiti still struggles for political stability more than five years after the departure of the last Duvalier. It is understandable that any entrepreneur, foreign or Haitian, would hesitate to invest in the prevailing climate of social and political volatility. Thus one sees the "flight" of capital out of the country, rather than investment in jobs for Haitians.
CHAPTER SIX
RURAL DEVELOPMENT IN HAITI: LOOKING AHEAD

Geographers and Development

Why would a geographer be concerned with "development?" If the predominant distinguishing element in the human geography of Haiti is the extreme degree of its poverty---"poorest country in all the Americas"---then the geographer as a social scientist will be obliged to confront this issue. A cultural ecologist may well strive to understand material culture traits relating to economic subsistence and to account for their place in the fabric of society and as elements of a changing cultural landscape. A humanist is likely to be further moved to propose strategies to alleviate human misery, to improve human well-being, to bring about a heightened level of development.

What is development? Many have proffered definitions. Streeten (1979: 28) noted that over the decades, development strategies change, but that the goal has always been "to reduce mass deprivation and to give everyone the opportunity to live a full life." British geographer John Connell (1973:28) gave a more complete definition:

What is meant by development? Development has hitherto too simplistically been regarded an economic phenomenon. As a minimum it is a higher GNP, but it is also greater 'self-respect' (independence of action etc.) and more satisfactory nutritional standards.
Clearly Gross National Product per capita is easiest of all indicators to measure. But growth as a booming GNP may merely result in an increased concentration of income in the hands of an urban minority, the growth of overt unemployment, great rural-urban disparities, and so on. Development suggests the relief of poverty (especially malnutrition) and a movement towards the reduction of inequalities.


Geographer Carl Sauer generally stayed out of the fray of development, but in at least one instance Sauer (1954: 15-27) was induced to weigh in on the topic of economic prospects for the Caribbean region. He called attention to the West Indies as a crossroads of cultural diffusion routes second only to the Near East. With notable clairvoyance, he wrote of the potentials of cropping standing tropical forests and intercropped conucos, two decades before "agro-forestry" came into vogue. Similarly, he called for increased attention to be focused upon tropical pastures and forage legumes, again, two decades before CIAT, the international agricultural research center in Colombia, began emphasizing that very work.
Mathewson (1987: 96-7) wrote that Sauer generally opposed rampant "positivism." Sauer frowned upon an unquestioned assumption of the "forward march of progress," an arrogant North American juggernaut of development for its own sake. However, Mathewson (1987: 105) also noted that Sauer appeared to leave open the possibility of improving the human condition with a "science" that was respectful of other traditions, one that did not exclude the accumulation of lore and wisdom of other cultures, spanning the millennia of "human/environmental co-evolution." One can detect a hint of this view in a Sauer quote cited earlier in the land conservation section of this work, where Sauer lamented the lack of research on the potential of lesser known tropical legumes that colonize clearings and abandoned fields (West 1979: 119).

What Development Is Not

Yapa and Zelinsky (1989: 610) referred to the study of theories of economic development as "one of the most exciting areas in geography and in social science in general." Yet they suggest a Babel of discourse in this field, alluding to what some have called a "crisis of development theory." There are many misconceptions about what "development" really is and a number of false notions deserve to be laid aside.
1. Development is not the same as economic growth. Daly (1991: 260) summed up a discussion of the distinction by saying "when something grows, it gets bigger. When something develops it gets different." There are abundant examples of economic growth, quantified, without parallel increases in human well-being (Weaver, et al. 1978: 20; Corbridge 1990: 393; Holloway and Pandit 1992: 57).

2. Development is not necessarily urban. Of 29 Latin American countries compared by Augelli (1985: 279) Haiti was the least urban, with over 70% of its population dispersed in rural areas. Projects to raise social well-being cannot be taken to every doorstep, but centers for various services such as health care, vocational agriculture and technical schools, coffee washing mills and shipping terminals can be dispersed to all nine of Haiti's states and not just hoarded near the primate city. Nor should they be so concentrated in one vicinity; rural to urban flight increases as a result. With virtually no government investment outside the national capital, many Haitians have fled the outlying provinces and converged on Port-au-Prince. The population of this urban center is estimated to have swelled by an average annual increase of almost 10% during the 1970s (Weinstein and Segal 1984: 134), overwhelming social services, and giving rise to the waterfront shantytowns of Cité Soleil, "Chicago," and "Brooklyn."
3. Development is not necessarily industrialization (Brookfield 1975: 70-2), but can follow an investment emphasis in any economic sector: manufacturing, agriculture, or services. Increasing economic output by and for the people of a region will probably involve increased efficiency in using resources of that region. This may be adding value to a local raw material, which would mean processing or an industrial process, but it could also mean added value per unit of product from a fixed resource such as parcel of land. That greater efficiency could be achieved by changing to a higher value crop, or higher-yielding crop variety, or more prolific animal breed. It could also be achieved by a thriftier use of time in the agricultural year through double-cropping, intercropping, or relay-cropping. Lastly non-industrial development might mean more vertical integration in terms of more local control of the marketing process, with more profit retained by the relatively less developed people and less flow of profits out of the community.

4. "Basic Needs" approach and the "Green Revolution" are not mutually exclusive. Basic Needs means an addressing of shortfalls of wellbeing, and such programs have in the past sometimes floundered when overly dependent upon "Green Revolution" or technologically-based approaches (Vermeer 1978: 61-2). However this does not mean that new technology or agronomic advances cannot contribute. Shorter season
crop varieties may mean the difference between harvesting only one crop each year or double the number of harvests and output. A litter of ten piglets instead of eight may make all the difference in staying solvent with a creditor. The key lies in who identifies the need for the technological introduction, and are programs designed with a broad awareness of local land and culture constraints. Who makes the decision of what will be adopted? Is that decision-maker conscious of the most vulnerable points of the introduction—a higher-yielding sorghum variety ... that is palatable to ravenous wild birds, whereas the old variety was not (McKenna-St.John interview, May 1986)?

5. A greater degree of socio-economic equity is neither unimportant nor unattainable nor necessarily Marxist. Weaver, et al, (1978: 20) discussed seven "growth with equity" models of development, none of which called for social revolution. Geographer Connell (1973: 28) offered the following assertion:

However, equality should be considered as an objective in its own right. Inequalities, especially increasing inequalities, are objectionable by any ethical standard...

In a more pragmatic vein, if the majority of citizens perceive a minority is not carrying its share of the public burden, then overall morale and program compliance—especially paying taxes -- will be severely compromised.
6. The possible politico-economic frameworks are not limited to a dichotomy of either Marxism or Capitalism. For example, one can abhor income inequities and be a Buddhist, a Jeffersonian, a throwback to the "Levellers" of the 17th century, a participant in a contemporary Green movement, or, someone who just takes seriously the teachings of Jesus Christ on the subject of "mammon."

Ultimately, development in Haiti will be carried out by Haitians -- not just as labor in foreign-led projects, but with programs designed by Haitians, to meet needs identified by Haitians. This approach with emphasis upon sensitivity to local culture and dignity, and upon sustainability with local resources has been encouraged in the American Tropics for almost two decades now by the Inter-American Foundation (Maguire 1979; Breslin 1987; Yapa and Zelinsky 1989: 610).

In a general way, two types of indigenous Haitian development bodies have been present in Haiti. The first is comprised of the ranks of well-meaning but resource-constrained and politically-distracted civil servants. Many of these professionals are well-trained and earnest, but in calmest of times are handcuffed by lack of means to carry out what they recognize needs to be done. In times of unrest, bureaucrats in any country become paralyzed by fear of making waves and calling undue attention to themselves. Such hesitancy could be observed in Haiti involving the simplest decisions and initiatives. However, these
interactions were noted in the late 1980s, during some of Haiti's most politically chaotic months in three decades.

The second body of development-minded Haitians is made up of the grassroots peasant unions and cooperatives, largely of the 1980s decade (Breslin 1987: 48-50; Maguire 1989; Wilentz 1989: 89-90, 257-9; Zimmerman 1986: 259-60). For related discussion on this, see the above section on coffee cooperatives, as well as the comments to follow on the sixth "basic need," popular participation.

The Basic Needs Approach

As stated early in this work, a Haitian agronomist (Cascagnol 1984) once pointed out to the author that while the petit habitant or peasant farmer is not cut-off from the cash economy, cash flow is of such low volume that virtually all basic needs, or fundamental requirements of rural existence, are required to be met from a very small parcel of land: food, fuel, fiber, building materials, and medicine as well as some income for exchange. Yet, the fact remains that the basic needs, as a package or ensemble, for millions of poor people is not being met. A development approach emphasizing this awareness emerged over a decade ago (Vermeer 1978: 60-1; Weaver. et al., 1978: 21-2; Streeten 1979: 28 ff.).

Consciousness of this multiplicity of needs has solid underpinnings in an ecological concept concerning the
survival of individual plants and animals. Formulated in 1840, Von Liebig's Law of the Minimum, holds that an organism will thrive only in proportion to the availability of the most limited element of all the elements needed for survival. If one essential factor, for example water, is in critically short supply, then an abundance of mineral nutrients or energy intake cannot make up the deficiency (Barbour, et al, 1980: 28-32). This law is revered as fundamental in agronomy and plant ecology, and is said to have "revolutionized agricultural theory" (Brady 1974: 3-4). Although development workers may have an implicit awareness of the concept, an explicit linkage of this biological law with rural development theory is not known to have been articulated elsewhere.

In fact, development projects languish in direct violation of this law. What good does it do to install a new sewer line—fixed infrastructure—on the poorer side of Port-de-Paix, if the residents there are squatters who have thrown together a shantytown without benefit of any title to the land, and are constantly vulnerable to sudden eviction by firebrand or bulldozer? Is human welfare addressed in an effective, sustainable manner, if one element of health infrastructure is added, but security of housing or land tenure is nonexistent?

Similarly, a program to provide free chemical fertilizer to coffee growers does little good and much harm
if the smaller producers have only a tenuous connection to a market outlet for what they now produce, in the sense of lack of buyers. It should not be surprising when this results in the usurpation of most of the fertilizer, the lion's share of the increased production and a more dominant position in the local market for the larger growers. Once again we have disproportionate attention given to a single input factor, and neglect of the why and how and what to do with it. Thus the multitude or complex of basic needs must be addressed. What are the most commonly identified "Basic Needs?"

FOOD AND NUTRITION

World poverty is often discussed in the idiom of "world hunger." If they are in any ways able, people will at least feed themselves and their families, though sometimes in just that order. World problems are often simplified and compartmentalized in national units, with generalizations that if the country of Haiti increases total food production, then most Haitians will automatically eat better. Despite comparisons that show Haiti to be deficient in food as a country, Latin Americanist geographer John Augelli (1985: 277) stated flatly that the sharpest nutritional differences are not between countries or even regions, but between the well-to-do and the poor of any given country in Latin America. If there are severe wealth
distribution inequities within a country, then lack of income or purchasing power can lead to starvation alongside bulging granaries.

Yet Haiti has not successfully increased its ability to feed its people. The World Bank (1991: 210) said that per capita food production there decreased from a 1979-81 index value of 100 to a score of 93 in 1987-89, even though comparable "lower income economies" increased their food production to a 103% level. Cereal imports into Haiti in 1974 worked out to be 18.4 kg. per capita, but had increased to 40.5 in 1989 (World Bank 1991: 210). Augelli (1985: 276) reported a United Nations comparison of 24 Latin American countries in terms of "nutritional quality of life" which found Argentina highest with a score of 10.0, while Haiti was last at 1.2. The average of all Third World countries would have worked out to be 3.67. with the U.S.A. at 12.09. A quick survey of food issues in Haiti prompts the following questions.

— What is an effective mechanism to insure provision of food adequate in quantity for the consumer in caloric content? When the mean daily food supply for 38 of the world's poorest nations increased in the two decades between 1965 and 1988 from 1960 calories to 2182 calories, the figures for Haiti showed a decrease from 2045 to 1911 calories (World Bank 1991: 258). Gillet, et al. (1985: planche 30, I.A.1) give a still lower national mean of 1700
calories instead of the magnitude of 2400 for active working adults and young mothers.

-- What are the best ways to provide food adequate in quality of nutrition? Many of the calories taken in each day are what might be termed "empty calories" in terms of nutrition, as mostly sugars and starches are provided in the akanson gruel at home, and in the sugar cane, mangos and keneps (Melicocca bijuga) foraged away from home. Even when peasants produce high protein foods such as eggs, they are often compelled to sell them for more pressing cash needs. Mothers in Northwestern Haiti could be observed in 1986 feeding their infants bottled malt beverages that were erroneously believed to be of higher nutrient content than breast milk. Wiese (1976: 193-6) found that lactating women in Haiti are often malnourished, and that this is partly because of food avoidances following cultural traditions of classifying foods as inherently "hot" (eggs, coffee, rum), or "cold" (mango, avocado, coconut).

-- Are there non-intrusive means to investigate food distribution within the household? The pecking order within homes is said to be a much overlooked aspect of the hunger question worldwide, as nutrition adequacy studies tend to stop at the household doorstep (Streeten 1979: 31; Falcon 1984: 177).

-- What effect does international dumping of surplus grain as "food aid" have on prices for local Haitian grain
growers (Le Nouveliste 3-14-86: 2)? Who distributes this food aid in Haiti? How do they react when the program itself is called into question?

— How is the building of new grain storage facilities by cooperative peasant movements received by traditional grain buyers, storers and money-lenders (Maguire 1989)? Is this issue only "economic" and not "political"?

WATER, FIT FOR DRINKING

Humans need several pints of water a day consumed directly for essential fluid balance, and they use still more for cooking. Other activities that usually take place in the home in the Developed World—bathing, laundering clothes—often never leave the river bank in the Less Developed World. The peasant farmer's animals must have water—either carried to them in considerable volume, or, more sensibly, by leading the animals to the stream. This may take place all too near the site where household water is drawn, sanitation notwithstanding.

Villagers know clear water from visibly nasty water, but one cannot expect people who do not read to fathom all the complexities of microbiology and the transmission vectors of diseases. Children all over the world will splash in a fountain, a rain puddle, or maybe in a livestock trough. If the children's chore is to carry water, they might not be averse to tapping the most convenient supply.
Many Third World villagers are scrupulous in construction and usage of latrines and outhouse pits, but what happens to that concept when slums expand over areas of high water tables, perhaps near the edge of the sea? Chamber pots will be emptied in the closest ditch or in the surf. Oblivious children will play there and get sick. This scenario is all too apparent at the waterfront on the east side of Port-de-Paix, Northwest Haiti, and in the shanty towns of northeastern Port-au-Prince. As of this writing, water-borne cholera has ravaged tropical Latin America for months.

Water for drinking, cooking and other domestic uses can be obtained from surface drainage, rainfall catchment, or ground water. Surface water especially is subject to contamination from disease-bearing organisms, infecting the community with guinea worms, giardia, dysentery, diarrhea, typhoid, hepatitis, and cholera (Goodwin and Duggan 1972: 103-06). Substandard drinking water can be either treated and rendered more pure, or replaced with purer water from a more reliable source, preferably ground water from deep strata. A combination of both strategies is often employed.

In Haiti, the Baptist mission, for example, has given high priority to deep drilling of water wells. In 1986, Baptist teams drilled and put into service 55 water wells and the International Child Care capped a similar number of wells in the East near Cerca La Source (Bridges 1987; anon.,
Haiti News 1988: 7). A French development team from the Salagnac center was building masonry cisterns in southern Haiti in the early 1980s at a pace of about 50 per year (Mathieu and Wolf n.d.:3). A Breton-sponsored project was digging wells and installing pumps also in Southern Haiti in the mid-80s (Blakeley 1988: 2). In the Northwest too, one could see recently capped springs and community standpipes at Gros Morne and Jean-Rabel.

Not only is water quality critical to good health, but the delivery of such water is an issue of no small concern in the Less Developed World. The cliché for the many locked into extreme drudgery is "the hewers of wood, the drawers of water." The author observed an illustration of water supply disparities in dry Northwest Haiti. The cistern at an upper middle-class Haitian residence in Gros Morne was said to be amply supplied with enough water to carry the household through the three months of autumn dry season. But only one week after the proprietor had gone back to his work in the capital city, all of the water had been doled out by domestic workers to relatives in town. For a while foreign houseguests drove an ancient jeep on water supply runs to the river at the edge of town. Burning imported gasoline to haul local water contrasts sharply with the daily toting upon one's shoulders of full clay jugs, or Jerry cans.
HEALTH CARE

In addition to the above listed water-borne diseases, other plagues, parasites, infections, injuries, malnutrition and—especially in infants—even simple dehydration combine to wreak havoc among people in the Less Developed World. Worse still, these ailments compound one another. Haiti is severely afflicted by tuberculosis and leprosy, two opportunistic diseases that flourish when human health is already weakened by malnutrition or other diseases.

Children are particularly vulnerable to deficiencies in health care. Many children die of preventable diseases such as measles because their bodies are weakened by malnutrition and internal parasites. Other childhood diseases such as diptheria and pertussis are easily controlled by vaccinations, but vaccines are particularly perishable if not properly transported and stored, usually needing reliable refrigeration (see following section on energy and development). Gillet, et al. (1985: section I.A.1.) list three other groups at high health risk: pregnant women, lactating women, and new arrivals to the metropolis. They also noted two main disparities in formal health care structures in Haiti, one in the share of facilities in the capital city area—16 out of 31 hospitals—versus the underserved provinces, and the second disparity in the greater share of service to accessible lowlands versus the near absence of facilities in the interior mountains. There
are government-run health care facilities in Haiti, as well as the operations of private volunteer organizations. The latter often receive a mandate from the government to be the designated providers for a particular locale. For example, the hospital at La Pointe in Northwestern Haiti is charged with serving the populace between Port-de-Paix and St. Louis du Nord to the east. Similar non-governmental hospitals include the Hopital Sainte Croix at Leogane west of Port-au-Prince and the most famous Albert Schweitzer hospital at Verrettes in central Haiti. In addition, smaller clinics serve rural communities. Examples in the Northwest include the small dispensary at L'Acul to the north of Gros Morne, and at Lacomat to the west of Port-de-Paix, there is a mother/child clinic.

Middle American countries such as Costa Rica or Panama could be placed at one end of the public support for health care spectrum, with Haiti at the other (World Bank 1991: 224-5, 258-9). However, Haitians are not unaware of the need to upgrade this sector of social services. As an example, there was a public campaign underway to restore morale and credibility to Haiti's corps of nurses, during the turbulent time of national reassessment following the departure of Jean-Claude Duvalier. At that time, typical pay for a nurse of three years' training was reported to be $125 per month, or $1500 per year, much less than the pay in neighboring countries (Jolynce 1986: 8).
Traditional or folk healing has borne much of the burden of Haitian rural health care. Its contribution is significant in terms of cultural heritage, but takes on greater importance as a stop-gap supplement to a formal health care system that has not yet come to full fruition. Though much less dramatic than the miracles of modern technology, many herbal remedies can be quite effective for modest applications, such as drying an open wound, or dissipating a fever. A tea from dooryard-picked Hibiscus blossoms and lemon grass was observed to relieve expeditiously bronchial congestion. A trailside survey of a lakou garden about 400 meters above Port-de-Paix revealed the following plants with medicinal applications: lanment, corail, détrimot, banane cuillese, médicinier béní, maskriti, tabac, cachiman cannelle, goyave, and deye dos. The last one is also known as quinine pays, or local quinine, and was found for sale in a small rural general store near St. Louis du Nord, as an infusion with rum and lemons in a gallon jar.

The above herbal remedies are among the items used by one type of traditional healer, the dokte fe, or "leaf doctor." The midwife or matron is a second health care giver who meets a practical need. The other two types listed by Gillet, et al. (1985: II.C.) are of more questionable value. The hounkan or voodoo priest offers a range of mystical cures and fixes for problems, including health complaints, and he may contribute real psychological
support to the afflicted. The fourth type of folk "healer" is the *picqueur*, a specialist in injections, who practices without benefit of formal training. The potential there for mishap—if not tragedy—is readily apparent.

LITERACY AND EDUCATION

Citing classic works in economic development thought, the 1991 World Development Report (World Bank 1991: 52-69) devotes an entire chapter to "Investing in People," or an emphasis on health, nutrition, education, and other long-term investments in human resources.

A comprehensive assessment of Haiti's development needs published near the turn of the twentieth century identified many of the same issues that continue to pose problems today. Foremost among these issues is illiteracy, *analphabetisme* (Justin 1915: 20). When Moral (1960: 220-1) proposed a plan of socio-economic reform, the subject still demanded a place of prominence, with illiteracy in rural areas calculated to be over 90%. Almost 30 years later, with national illiteracy persisting at 80%, Francois (1988: 57) and Wilentz (1989: 120-1,177) found themselves still confronting the same problem.

One of the first social reform programs of immediate post-Duvalier Haiti was the rejuvenation of a broad-ranging adult literacy campaign, *Mission Alpha*, and in Creole, *misyon alfa* (*New York Times* 3-11-86: 3). However, the
connections between spreading literacy, a speedier and more effective sharing of general news and information, and an awakening grassroots political consciousness were unmistakable. "Knowledge is power," and the prospect of an informed populace threatened an elite that traditionally monopolized both economic and political power. In 1988, after only two years, the Roman Catholic Church in Haiti officially ended its substantial support of neighborhood adult literacy groups, purporting that the small classes were fomenting socialist propaganda (Miami Herald, 12-15-91: 22A). What is the point of this recounting? Here is yet one more illustration of a basic and obvious step in socio-economic development—teaching people to read—that was directly impeded by political interests—which are alleged by the US government to be of little or no influence upon Haitian emigrants to the U.S.A.

EMPLOYMENT AND INCOME

Like many other countries of the Less Developed World, Haiti has a labor force that faces chronic unemployment and underemployment. While many rural Haitians have migrated to the primate city, Port-au-Prince, in hopes of finding work, the majority of Haitians still reside in rural areas, and therefore the thrust of this section is a survey of rural employment issues and counterproposals.
The issue of unemployment bridges from the traditional folkways of Haitian peasants in crafts industries to economic enterprises of the twenty-first century. While the carving of wooden mortars and pestles is a folk craft handed down from past generations, a more vigorously marketed export of teak or mahogany furniture is a low-technology but value-adding industry, and could earn additional foreign exchange for a small nation's coffers. Weinstein and Segal (1984: 100) reported that crafts exports rose from $2.3 million in 1965 to $19 million in 1979. The cultivation of tropical fruits such as mangos goes back centuries to the Old World. Turning fruit juices into pina-colada cocktails can contribute to lure tourist dollars to Haiti tomorrow. This diversified exploitation of local resources is being carried out by some of the church mission projects. Indications were that more recent grassroots populist cooperatives have begun to subscribe to similar projects, keeping more control and profits in the hands of Haitians themselves (Haiti News DEC 1991: 22).

As Newland (1979: 10) pointed out, different countries count "employment" in different ways, sometimes counting only one hour of work per week as "employed." "Underemployment" takes many subtle forms. It is most easily counted as number of hours available for additional employment. Harder to measure, but more significant for the Less Developed World, is "disguised unemployment" or
employment at only a very low level of productivity and pay (Newland 1979: 23; Zuvekas 1978: 66). Yet another form is the seasonal alternation of periods of increased demand for farm labor followed by weeks of no work.

Many Third World people are "employed" in menial and degrading activities, because their survival dictates bringing in something. "Unemployment" is an uncommon luxury in the Less Developed World, because there usually exists no formal safety net of mitigating social programs for the many. Newland (1979: 13) cited an International Labour Organization study on Asian poverty that concluded that, "most of the poor are not unemployed and many of the unemployed are not poor." The point here is that nominally low unemployment figures for a Third World nation—when available at all—believe the fact that large numbers of poor people are uncounted, hidden among the "employed," and working for meager compensation.

Underemployment's most obvious effect is the failure to provide adequate incomes for individual Haitian families, and Newland (1979: 11-12) wrote that this can be a surrogate measure for underemployment, although there is some hazard here of circular reasoning. Haiti seems to be poor enough in terms of the crude statistics of mean per capita income—about $300. However Maguire (1979: 9) reminded us that skewed disparities of incomes conceal the more accurate reality of a median income of closer to $40-60 per annum for
the mass of Haitians. In the spring of 1986, a typical domestic worker in the home of Haiti's upscale 10% was reported to receive a monthly salary of $15 to $20 per month, or $180 to $240 per year.

Zuvekas (1978: 74) reported unemployment figures for Haiti in the 1970s to be 77% for the 15-19 age group, and 60% for ages 20-24. However, important changes have taken place in the ensuing decade. It is estimated here that the Haitian population increased from 4.8 million in 1978 to 6.1 in 1988, with the population pyramid now much wider in its youthful base. That means, a relatively large proportion of a generation is just now entering the job market.

A second major change in Haiti's economy in the decade since Zuvekas (1978), is the rise of foreign-owned assembly industries. These date from the seventies, but their establishment was accelerated after the inauguration of the Caribbean Basin Initiative in 1984. In early 1986, there were over 200 such American companies in Haiti employing about 50,000-60,000 people.

However, these factories are concentrated in the primate city of Port-au-Prince, and this location impinges on at least two problems. First, the concentration of industry and jobs in the primate city only accelerates rural to urban migration. Second, the main place of friction in times of political instability is the capital city, the hub of communications and political power. It was estimated
that about one quarter of Port-au-Prince's 50,000 factory workers lost their jobs in the civil unrest of early 1986 (Treaster, New York Times 7-7-86). Inasmuch as the unrest has not been resolved, most, if not all, of these plants are expected to remain closed for the foreseeable future.

Are rural industries in jeopardy? Chuta and Liedholm (1984: 309) cited evidence that rural crafts industries in Haiti, especially woodworking, grounded in tradition and still viable in terms of market demand, are running into problems of lack of materials. Underwood (1964: 474) noted that seasonal labor in cane harvest and other farm enterprises traditionally accounted for a significant income supplement for young men. But seasonal employment in the agricultural sector has been much reduced with the decline of the sugar cane industry, both within Haiti and in the Dominican Republic (see previous chapter). Reportedly, formal arrangements between the two governments to supply 20,000 Haitian cane cutters annually to the Dominican Republic were suspended with the departure of Duvalier, but about 40,000 have been provided nonetheless through underground recruiting, and then funneled into deplorable working conditions (Turner 1990: Baton Rouge Sunday Advocate 5-13-90: 1D).

Tourism once employed low wage service workers from the ruins of La Citadelle in the North, to the beaches of Jacmel in the South. However, tourist revenues have fallen off
with the political turmoil of recent years. Tourism was further hurt by AIDS scares. From 1982 to mid-1985, AIDS was officially linked to Haitian ethnicity by such respected authorities as the national Centers for Disease Control in Atlanta, with "Haitian-born" listed as one of four "groups at recognized risk" for AIDS, along with homosexuals, hemophiliacs, and intra-venous heroin users (CDC 1982a: 361; 1982b: 577; 1983: 635; 1984: 661-4; 1985: 245-8). Implications for travel to Haiti were all too clear. Between the AIDS scare and the civil unrest, tourism declined as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>148,000</td>
</tr>
<tr>
<td>1984/85</td>
<td>117,000</td>
</tr>
<tr>
<td>1987/88</td>
<td>86,000</td>
</tr>
<tr>
<td>1988/89</td>
<td>68,000</td>
</tr>
</tbody>
</table>

-- (EIU 1988: 32; EIU 1991: 40)

Additional non-quantified costs are incurred with unemployment in the sense of loss of place in the community and in society. "Anomie" is an often paralyzing feeling of loss of one's "place" in the world, a numbing shock of feeling cut off from participation in one's own culture. It is a cognitive dissonance, a perceptual conflict between the way things are "supposed to be," and the realities of one's present baffling hardships, which may extend to an immobilizing loss of self-esteem. This non-market externality of unemployment was highlighted by the British economist Schumacher (1973) two decades ago, and others have
noted the same problem (Zuvekas 1978: 72; Newland 1979: 20).25

Traditional approaches to underemployment generally depend on assumptions of capital accumulation and concentration by paternal entrepreneurs, into a critical mass for local investment. Although driven by profit-seeking inherent in free enterprise, the accumulation and trickle-down is expected to yield spin-offs of well-being for the less privileged in the form of jobs and income generated. However, Penn State University geographers Yapa and Zelinsky (1989: 610) are not alone in their field in questioning whether "... neo-classical economic theories of development have helped to improve the standards of living of the world's poor" (Corbridge 1990: 393; Holloway and Pandit 1992: 57). Can "trickle-down" theory be upheld, when economic gains of the wealthy are not reinvested in Haiti, but "trickle laterally" to investments in Miami real estate, Swiss bank accounts, Pacific Rim mutual funds, and the auto industries of Germany and Sweden?

25In fact this sense of lack of place can be aggregated and extended to the national scale. Haiti fits uncomfortably in the largely Spanish-speaking community of Latin America. Haiti sits somewhat more comfortably in the fellowship of West Indian nations, but misses out there on the bond of English language and British Commonwealth traditions. Perhaps modern Haiti is closest in culture and spirit to French-speaking, coffee-growing, deforested nations of West and Central Africa, but even that would-be fraternal relationship fails to hold up in the long reach spanning the Atlantic.
Policies can be designed to create workplaces directly, but questions could be raised as to what group or groups would benefit and in what proportions. Would it be appropriate for Haitian public funds to benefit primarily large firms of the private sector with the entire Haitian workforce held in reserve for low-wage, foreign-owned manufacturing, with profits fleeing the country (Wilentz 1989: 273-4)? Would it be more effective to get seed capital directly to the informal sector's small merchants, traders and craftsmen (Weaver, et al., 1978: 21; Haiti News DEC 1991: 22)? Does one dare invest only in an atmosphere of socio-political stability, or does one achieve the latter by daring to invest anyway? These questions are pivotal to effective regional development strategies.

PEOPLE PARTICIPATING IN POLICY-MAKING

The universal human spirit is such that an individual needs to feel a degree of control over his or her own fate. This so easily taken for granted in the relatively democratic Northern Hemisphere, but a lionized leader of the emerging "South" once put it in this light:

Freedom and development are as completely linked together as are chicken and eggs! Without chickens you get no eggs; and without eggs you soon have no chickens. Similarly, without freedom you get no development, and without development you very soon lose your freedom (Nyerere 1974: 25).
Streeten (1979: 29) identified participation in the decision-making process as one of four basic needs pillars, and geographers Yapa and Zelinsky (1989: 610) listed "participatory development" as one of the emergent themes in mainstream development theory. The World Bank (1991: 85) concluded after decades of observing development projects around the world, "high correlations between project performance and levels of participation."

Emphasis upon the grassroots or "bottom-up" approach to development is the guiding paradigm for the Inter-American Foundation, an agency that supports locally-initiated projects in the Less-Developed Countries. Their consultants in Haiti are said to be held in highest regard (Breslin 1987: 97). Haitian scholars examining the country's development needs have begun to call for socio-economic surveys to ask the people themselves what are their need priorities (Brutus 1988: 59-60).

Do Haitian citizens give evidence of a "basic need" to participate in the development process? Maguire (1979: 5) recounted a vivid illustration of the older approach. A school building near Belladère, sat vacant and decaying, though in an area where all agreed on the need for more and better schools. The problem was that the project had been originated and imposed from without. The local community felt no sense of belonging to the program and rejected it.
In Haiti of 1986 populist frustrations were evident in bold scrawlings of graffiti that adorned walls everywhere: "Anbas President a vie," (Down with "president for life"), the more pervasive "Chak 4 ans" (Each 4 years ... we get to choose again) and "Nou vle jistis," (We want justice). Then in the national election in November 1988, despite warnings in the preceding weeks of impending violence, an estimated thirty to forty people were murdered at the polls, trying to participate by casting their ballots (Wilentz 1989:324-6; Abbott 1988: 1-7).

The issue of decentralization or sharing of political power lies at the very heart of ongoing conflict in Haiti. The next section of this work will examine the decentralization of a different sort of "power," alternative sources of energy for fueling rural development.

Sustainable Development. Renewable Energy

WHY AN EMPHASIS ON ENERGY?

If geography is both an earth science and a social science, then perhaps these two divisions are best linked by cultural ecology. Recall that cultural ecology explores the relationships between peoples and their land—peoples with all their cultural peculiarities, and the land with all its natural resources. The relationships change as some resources are depleted and others are made available with changing technology. Energy resources become redefined with
time. They are not limited to fossil fuels that are extracted from underground.

Does "money make the world go 'round?" Perhaps energy makes the economic world go around, and money is just a proxy medium representing energy. While the entire world bears responsibility for conserving our finite energy resources, conservative consumption of energy resources in Haiti is particularly crucial for several reasons.

Firstly, Haiti is impoverished and generally lacking in natural resources such that Haitians bear a logical imperative to shepherd and use most efficiently those resources that are available. This imperative is a matter of folk wisdom at the household level, and the common sense peasant needs no lectures on this score. However, the urgency of this imperative must also be realized at the national level, as foreign exchange is too dear to be squandered on imported fossil fuels for big cars and for kerosene appliances that might be powered otherwise.

Secondly, it is no secret that Haiti is undergoing a crisis in terms of depletion of traditional fuels, specifically domestically-supplied fuelwood. Without a doubt, the cutting of trees—both large and small—for fuelwood has been one of the most wantonly destructive impacts of humans upon the Haitian landscape. This phenomenon reflects the influence of several powerful factors—the overall dearth of natural resources for the
nation as a whole, the rapid growth of population and consumption, and the desperate need for generating cash income in rural areas. As the old ways are no longer viable, fresh approaches will be required.

Thirdly, because of its latitude and climate, Haiti is one of a number of countries relatively better positioned to take advantage of the emerging alternative energy technology. This is especially true for photovoltaics and wind energy generation, and somewhat less so for additional hydro-electric development. Almost forty years ago Carl Sauer (1954: 16-17) ruminated on the economic prospects of the Caribbean. He acknowledged historical reliance on the burning of sugar cane bagasse and on windmills, and highlighted additional wind and hydro-electric potential for the region.

THE NUANCES OF "POWER"

There is a fourth reason why alternative sources of power are required in Haiti. It is no mere coincidence that the word "power" bears connotations of both the technological harnessing of energy, and of strength, clout and control in government and society. The word comes to English via the French verb pouvoir, "to be able to" and signifies means, "can-do" potential, wherewithal, and options. No power means no control over the elements of
nature and no control within human society outside of one's own walls, (or perhaps even within the walls).

Access to power in the energy sense means even the smallest of producers can magnify his or her own labor, or "save labor" or augment production per unit of time all under one's own management or control, for one's own profit. The unempowered alternative is to find one's place in the socio-economic system as a mere unit of cannon fodder, a body to be enslaved in times of plantations, or later impressed into public works gangs or corvées. The mindset that prevails in the "developed West" also has been inculcated in Haiti for decades and assumes that power will be dribbled out from a central authority. The realization that power, in either connotation, could well up from dispersed origins might deliver a jolt to commonly-held preconceptions. We are just now beginning to see that take place in the Haitian politics of the late 1980s.

Countries such as Switzerland, New Zealand, and Japan are often held up as examples of sustainable economic vigor. Yet the productivity of these states is not explained simply by lack of ethnic discord nor by sheer thriftiness. These industrial economies have been tremendously boosted by the natural endowment of hydro-electric capability. Even relatively less developed countries such as Costa Rica draw 70% of their electricity from hydro-power (Flavin 1986: 17). It generates over ten times as much electricity as Haiti,
per capita. Cyprus heats 90% of its water for homes from solar heaters. How is Haiti powered and how does that tie-in to economic development? How was Haiti powered in the past?

One hears from time to time a lament for the lost riches of colonial Haiti, along with a query over how "so much" could be squandered and reduced to "so little." This superficial gross accounting overlooks the fact that the basic colonial commodities of sugar, coffee, cotton, tobacco and indigo were garnered from the land by the power of slave labor—the coerced aggregation of human muscle, at the extreme expense of human well-being. It takes something to make something, whether at the scale of the individual firm or of the nation. While the economist reduces the most basic factors of production to land, capital, and labor, external infusions of energy amplify human labor or save labor and time relative to other inputs and output.

Fuelwood is said to have accounted for over 80% of Haiti's energy consumption in the early eighties, both at the peasant hearthside and in industrial applications. Distilleries, processors of essential oils for perfumes, bakeries, and dry cleaners burn wood and charcoal (Kermel-Torres 1985, planche 21, I.A.).

---

24*Haitian sugar mills are said to be energy exporters, netting 42 kwh per metric ton of cane (Olivier 1981: 4-5).
How much wood does a peasant family burn? Without having that data measured for Haiti, there are at least three ways one might try to obtain a surrogate estimate.

1) The World Bank gives a 1987 per capita energy use value of 50kg petroleum equivalent or 2170 megajoules (MJ) which can be converted to lbs. dry wood, then common green wood, then multiplied by capita per household to give a level of 1600 to 2000 lbs. However the original figure was a mean for all of Haiti and skewed by much greater urban residential and commercial use. If one reduces that by the 83% fraction in fuelwood burning, a magnitude of 1400 to 1700 lbs. per year per household is obtained.

2) Those figures seem small when compared with estimates based on "end-use" calculations. In a study of charcoal use in China, Spencer (1971: 119-20) judged that 30 MJ of charcoal would cook a simple meal. Smil (1984: 149-50) used a higher value of 50-63 MJ. The former would convert to 1950 lbs. green wood per year and the latter gives 3150 lbs. 3) Much larger values were empirically obtained for the Third World countries of Tanzania, Gambia and Thailand, giving annual consumption figures of respectively, 3600, 2400, and 2200 lbs..."per capita" (Openshaw, cited by Eckholm 1975: 13). Haitians usually cook only one big mid-day meal per day.

Petroleum products meet much of the energy needs for Haitians of the urban middle and upper socio-economic
classes. With the Caribbean and Gulf of Mexico virtually ringed by oilfields, islands of the West Indies could once be supplied with, what was then, "low-cost fuel oils available on short hauls by tanker" (Sauer 1954: 16). In the more recent years prices have shot up, but by the early 1980s the volume of Haiti's imports of petroleum products had doubled in one decade, rising to almost 2 million barrels. In 1987 energy imports accounted for about 16% of the value of Haiti's merchandise exports for a figure of $42 million (Kermel-Torres 1985; World Bank 1989: 172). Today Haiti runs about 50,000 vehicles that account for most of the demand for imported gasoline and diesel oil. Kerosene remains most important for lighting to those without access to central grid electricity.

ENERGY ALTERNATIVES

A decade ago, in writing a thorough review and analysis of Haitian peasant poverty, Lundahl (1979: 200–4) included a brief examination of alternative energy prospects for Haiti. His conclusions were not very sanguine, but may well have been accurate and appropriate for the time of his study. 27

27 A social scientist examining a given slice of humanity recognizes that socio-economic conditions and even culture itself are dynamic, evolving entities. Thus a research project is temporally framed in what is termed the "ethnographic present." Accordingly, discussions of technology need reevaluation from time to time, as "better mouse-traps" are developed. The prospect of direct economic pay-back gives additional impetus to the frenzy of research, development and marketing of new technology.
He said Haiti's smaller rivers were too uneven in flow to make hydroelectricity unless dammed, and dams were, in his opinion, too costly (1979: 203). He said wind power offered no solution because it required conversion to electricity. He then admitted that "solar power would be an excellent source," but stated that "today none of (its) applications is cheap enough to compete." He myopically concluded (1979: 204) that "no economic substitute for charcoal and wood will become available in the near future." But things change.

As Lundahl (1979) was concluding his research, the Western World was just beginning to feel the effects of its second "energy crisis" in the span of a decade. There followed an intensified push to develop alternative energy forms, bringing down the cost of photovoltaic modules or "solar cells," and dotting the California landscape with "farms" of wind turbines. Lundahl's conclusions are in need of a critical reexamination in light of this procession of technological developments of the early 1980s.

**Solar Energy.** Passive solar heating of water for domestic uses is already in place in Haiti, and this relatively "low technology" has significant potential for expansion. The capture of solar energy in its simpler forms—black-painted water drums on the roof—can be rather "low-tech." but only slightly more sophisticated arrangements can
heat water to temperatures needed for pasteurization. In 1941, over half of the population of Miami Florida received hot water from solar heaters (Deudney and Flavin 1983: 58). "Solar showers" are essentially 5-gallon plastic bags capable of heating 60 degree water to almost 110 in three hours exposure to full sunshine. This writer gratefully looks back on these invigorating baths throughout many months of low-budget travel in Haiti.

More advanced technology brings the generation of electricity with photovoltaic or "PV" cells. Lundahl (1979: 203-4) noted Haiti's "high intensity of solar radiation," but asserted that, in his ethnographic present, solar energy was prohibitively expensive, especially as an alternative to fuelwood in peasant households.

Lundahl could not foresee that the intervening years have witnessed a gradual fall in the unit cost of photoelectric generation per kilowatt-hour, from $30 in the early 70s to $0.30 in 1990, with 6000 villages in India now relying upon solar cells (Flavin and Lenssen 1990: 20). Flavin and Lenssen (1990: 21) state that further decreases can be expected, perhaps to $0.10 by the end of this decade. Supporting such projections, the Sandia National Labs announced in mid-1988 that research begun only four years before had produced the gallium arsenide crystal as a successor to the workhorse silicon photoelectric crystal,
with energy conversion efficiency raised from the 18-20% level, up to 31% (New York Times, 8-16-88: 25).

2) By the mid-80s solar box cookers—elegant in their simplicity—were shown to be cheap and effective, and Metcalf (1989) thinks they have a great future in Haiti. They effectively cook rice and smaller beans, but only work in the bright sun of mid-day. Solar box ovens are sometimes rejected by villagers, as observed in projects in India and Mexico, yet the innovation was more successfully received in villages in China and Upper Volta (Deudney and Flavin 1983: 65).

3) Virtually no one would argue that each peasant home could or should be burdened with a pile of high-maintenance, scarcely comprehensible exotic generating paraphernalia—in short, "inappropriate technology". However, much public good might be derived from the centralized placement of on-site sustainable power generating equipment for key community service centers such as primary health care clinics, or perhaps in cooperative cottage industry shops. A World Health Organization study in Gambia showed a solar photovoltaic refrigerator giving a lower vaccine cost per dose than standard kerosene-fueled refrigerators (UN 1989: 209).

Similar value might be derived from high-efficiency fluorescent lighting powered by even a tiny system (40 watt) of solar cell and battery storage. Here a quite modest
investment might have dramatic impact on a school or library in a remoter village. Neither kerosene lamps, nor diesel generators observed in use for lighting in Gros Morne, Haiti, are as economical as photovoltaics today (UN 1989: 195–7).

Wind Energy. Windmills have been turning in Northwestern Europe for centuries with direct mechanical applications. Similarly, in the American West windmills have pumped many a gallon of water and Sauer (1954: 16) and Galloway (1985: 345, 349) noted their historic role in the West Indies as well. Low-tech pumping of water is also needed in Haiti for lifting potable water, as well as for the less simple churning out of electricity from wind energy generators or “WEG's”.

While extensive tracts of the earth are shrouded in an atmosphere of dead calm, many other lands are fanned by steady breezes, at least seasonally. Northwestern Haiti is freshened by some of the steadiest winds of the world during several months of the year. These are the tradewinds, les Alizées, blowing from the northeast. While strong enough to turn windmills, they are not so strong as to damage equipment. Garside (1988: 25) cited mean wind speeds of 5.3m/s (11.9 mph) as typical in the Bahamas just north of Haiti.

Electricity generation output increases with the cube of wind speed. As one moves even a few meters up above the
earth's surface, wind speeds become predictably and significantly greater. Thus hill-top sites are often favored for wind generators. When topography funnels and concentrates winds through a valley, and up through a gap or pass, still better sites are obtained. Where wind speed is just below thresholds for generation of electricity, it may still be sufficient for conventional windmills with their lower revolutions per minute, but a higher torque that is well-suited for pumping water.

A professional installer of solar energy hardware (Simpler 1991) has suggested that a potential problem with wind generators in the West Indies could be vulnerability to lightning strikes. However, the plethora of existing windmills on the tornado ravaged Great Plains of the U.S.A.—not to mention the radio towers, powerlines and substations—suggests that there are ways to ground properly small windmills in the Caribbean region as well.

Meanwhile wind energy generators are going up both to the north of Haiti in the Bahamas, and south of Haiti on Barbados, where the Trade winds blow still stronger (Garside 1988: 25). As with photovoltaics, per kilowatt costs of generating electricity by wind have gradually come down over the past two decades. Unlike PV's, there is an additional savings in unit costs based on the scale of the wind hardware. When PV's generate electricity for
$6.60/watt, regardless of how many increments of panels are added, wind turbines produce as follows:

- 50 watt — $9.00/watt
- 250 watt — $3.50/watt
- 1500 watt — $1.93/watt
- 10000 watt — $1.15/watt

(Bergey 1991: 66)

Hydroelectricity. Electricity in Haiti is primarily generated by the hydroelectric facility at Lake Pêligre, supplemented by the steam plants and smaller hydroelectric dam facilities. The link between central political authority and centralized control of energy generation are most obvious with a national system of hydroelectric generation. The dam and reservoir of Lac Pêligre were completed and running in the late 1960s yet this electricity has been largely reserved for the primate city, Port-au-Prince. The installation of the first power poles and transmission lines was approaching, at a tortoise-like pace, the outskirts of the northwestern town of Gros Morne in late 1986.

The power produced at Haiti's Lac Pêligre is of the magnitude of 38 megawatts (less in the dry season, more in the wet), while a relatively small utility-owned dam in the U.S.A., such as Martin Dam in Alabama, produces power of the magnitude of 150 megawatts. In the Developing World, an increasing emphasis is placed on construction of "small" hydroelectric plants of less than 15 megawatts. Several
thousand of these have been constructed in China in recent years, averaging just over 100 kilowatts in capacity (Flavin 1986: 50, Shea 1988: 14).

When North Americans pause to think about generating hydroelectricity, they probably think "big"—perhaps towering Hoover Dam, or Grand Coulee Dam on the mighty Columbia River. Yet earlier in this same century, most electricity in France, a "developed" country, was produced from a) small plants, and b) hydro generators that did not even require costly dams and impounded lakes. The latter plants are called "run of the river" plants, or in French, au fil du rivière. While cheaper than generators fixed to dams, their output is variable with the fluctuations of stream flows. Circa 1940, France was transmitting electricity from about 5000 sites, totalling over 600,000 kw, and averaging 125 kw per plant (Lanoy 1949: 12). The French are still improving technology for these "low head" (less than 20 meter fall of water) operations, and advanced turbine and propeller generators are being developed for these purposes.

Though costly in both construction expense and land use disruption, dams do offer the important advantage of regulating and stabilizing water flow at the generation site. This is most important for the uneven periodic hydrographs of streams that one would expect to find in the seasonally wet/dry tropics. Streams of Northwestern Haiti
such as Trois Rivieres and Dlo Pendu may be virtual dribbles in dry early winter, but can burst into churning torrents after springtime deluges, overwhelming vehicles in the act of fording, as witnessed by the author. Yet this same periodicity that dams mitigate becomes their undoing if watersheds are not kept under forest cover, as sediment from eroded slopes can radically shorten the life of an expensive reservoir (Deudney and Flavin 1983: 172-5, Shea 1988: 13). Small drainage basins can be reforested to even out stream flow, and some of Haiti's streams are fed by relatively steadier rainfall regimes (Rivière des Barres in the eastern end of the Northwest département, and several in the far southwestern corner of the country).

**Alternative Combustibles.** A world away from the latest the latest alternative energy technology, the reality of burning fuelwood prevails in rural Haiti, despite worsening scarcity problems. Numerous agencies have been struggling to promote tree-planting, emphasizing fast-growing species that can yield fuelwood in as little as three years, but these efforts are not unqualified successes. Are there feasible alternative combustibles?

If industrialized countries dump food aid on the Haitian market and inadvertently undermine Haitian grain producers, could they just as well give charcoal to Haiti, to reduce intentionally Haitian charcoal production and associated deforestation? Yet the primary producers of
charcoal who would be shut down are dispersed micro-businessmen with little or no alternatives for earning income. Is it feasible to get charcoal directly to them? Even if such a distribution could be managed, it would need to be linked to an urban conservation education campaign. Helpful innovations might include the adobe-like Lorena stove, estimated to save 1/3 to 1/2 of the fuel used by traditional wood-burning cook stoves (McRobie 1981: 245-6).

Nonetheless, at some point alternatives will have to be found to replace wood and charcoal as cooking fuels. Lundahl (1979: 201) wrote of Haitian consumers rejecting kerosene as a cooking fuel as imparting an objectionable flavor to food. Kermel-Torres (1985: planche 21 section I.B.) noted an increased use of LP gas and grid electricity for cooking in up-scale households in Port-au-Prince. Others in development projects see specific alternatives that are now available at a low and attainable level of technology, and powered by renewable sources of energy, such as the solar box ovens.

While elsewhere sunflower and soy oil are mixed with diesel to stretch fossil fuels, Haiti's castor oil probably cannot be produced on a scale for burning to justify its taking food crop land. Sugarcane bagasse is now burned as a by-product at the mills, but is also not a national solution. India and China are building biogas digestors, but questions immediately arise as to whether Haiti can
spare that amount of organic matter in a land so in need of animal fodder and compost for topsoil building.

PUTTING IT ALL TOGETHER: HYBRID SYSTEMS AT THE PROPER SCALE

No single source of energy represents a universal solution to all of Haiti's energy needs, but two or more sources can be yoked to complement each other. In fact, wind and solar complement each other especially well because periods of least sun—winter season, storm events—tend to be times of greater wind speed.

In a hybrid generating system, additional flexibility is provided with the inclusion of a diesel backup generator. These are not uncommon in Haiti now as stand-alone energy providers and Wilentz (1990: 155) alluded to these "Delcos" in scenes of contemporary Haitian rural life. While the plants themselves are initially less expensive than most other types of generators, the fuel costs quickly mount up, making them more expensive, the more they are used—just the opposite of wind turbines and PV modules. Cranking out continuous AC current while running, diesel power plants are most useful for the brief operation of high energy demand tools and appliances. Smaller routine needs can be met with stored DC current generated by WEG's or PV modules.

In Sri Lanka, projects have linked together PV, wind, and diesel generators, with battery storage, water pumping, and invertors to convert current from DC TO AC (Sepalage
1985: 9-37). Such a system has applicability in Haiti in schools, hospitals, or even small rural industries.

Applications of this new technology are in place and operating in Haiti today. In Pignon, on the central plateau of Haiti, a school compound has been outfitted with a system of photovoltaic cells, primarily for lighting (Simpler, et al., 1991). Haitian entrepreneurs are beginning to appear in commercial listings offering to install 40 watt photovoltaic lighting systems in remote areas (The Haiti News DEC 1992: 50,61). Methodist missions on Isle Gonave included a solar water distillation project (Kermel-Torres, 1985: planche 21, section III.).

Must the issue of cost be prohibitive? If only 1% of Haiti's 1987 governmental outlays, $2.8 million out of $287 million, could be spent on renewable energy generation, Haiti's approximately 50 hospitals could all have 20 kilowatt wind generators, with solar cell arrays, battery storage and diesel backup. If foreign governments can spend millions to re-equip the Haitian military, and to commission endless development studies that conclude "Haiti is underdeveloped," then maybe they could undergo a practical awakening for a project to help Haiti power itself.
CHAPTER SEVEN
CONCLUDING REMARKS

Summary

This study rests in the tradition of cultural ecology, a theme that explores the interrelationships of "man and land." Land use in Haiti is governed by the traditions of the Haitian people, tracing their heritage not only to West and Central Africa, but also to the ferment of contact between Europeans and AmerIndians. Manifestations of material cultural shape and adorn a cultural landscape. But non-material culture shapes contemporary society through not only mankind's religion and belief systems, but through human constructs of politics as well. Political traditions --even at the local village level, and not necessarily articulated in a legal code--contribute to defining a society. The geographer might be reminded of points of significance regarding the various scales of political issues. 1) Political traditions constitute an element of culture. It follows that they can be grist for the cultural geographer's mill. 2) Political traditions have discernable influence on land tenure, crop selection, and land use, and thus contribute to the explanation of cultural landscapes. The examination of foreign political traditions is a
valuable part of the geographer's methodology in understanding peoples and place.

In rural Haiti, local political considerations can be traced in resistance to the development of cooperatives for the marketing of coffee, and in reaction against a corporate construction of maize and bean storage facilities that would hedge peasant subsistence against the risk of both natural hazards and of seasonal market fluctuations. Even the selection of a root crop over a grain crop may have socio-economic and political implications in reflection of its "hidden harvest" advantages. The recent past and the near future of the export commodities coffee, cane sugar, and citrus fruits bespeak politics of a different scale, that of international trade maneuverings. The vagaries of all of these three industries carry repercussions right to the doorstep of the rural household economy.

The 1980s demise of Haitian hogs bears political implications regarding international relations for the Haitian populace. They perceive themselves imposed upon by foreigners who replaced familiar creole hogs with alien ones, all with the benediction of the Haitian authorities. The swine restocking program has been a qualified success in that pigs are once again in the market, and pork is once again on the table. Yet the affair has engendered a measure of bitterness and resentment that may not soon be forgotten.
Domesticated animals figure in the lore and cultural ecology of Haiti in many other ways. Both hogs and chickens are so thoroughly woven into the Haitian way of life, that they appear as frequent subjects of folk proverbs. The chicken—perhaps for reasons of expediency—figures especially prominently in the voodoo religious tradition. Understanding the place of beliefs and folk traditions in a nation’s culture is vital in carrying out effective development programs, as aggregate social behavior loosely follows commonly-held values and beliefs.

The goat—at the same time so valuable in the rural economy, and so potentially destructive to the land resource—perhaps looms even larger in Haitian culture. This prominence is evident again in proverbs, in place names upon the landscape, and in plants named by relating them to something still more familiar, the goat.

With the omnipresence of the goat, the difficulties of making a living in the Northwest region might be symbolized by that one culture trait alone. Other indicators of a harsh environment for cultivators is the emphasis upon manioc versus food crops of a higher value, along with the relatively larger role of castor, and a relatively smaller one for coffee.

The Haitian physical environment has been popularly portrayed as totally devastated, a total loss, or a moonscape with the implications that either it might not be
worth developing further or worth saving, or that Haitians might be incapable of managing their own land. These are seriously erroneous portrayals. Aside from exaggerations of the degree of land degradation, it is inaccurate to extrapolate and to generalize too sweepingly from localized impressions of Haiti's varied climate, topography, geology and pedology. Aside from Haiti's human resources of determined people persevering in harsh surroundings, the country retains other subregions of fertile cropland, a splendor of mountains and beaches, and more importantly, a tropical climate with renewable energy resources that grow ever more valuable and have scarcely been harnessed.

Haitians have been dismissed as too suspicious of each other to cooperate in collective grassroots programs such as credit unions, but events of the last decade have clearly shown otherwise. In everyday conversation one will hear "You cannot eat gumbo with just one finger." Haitian farmers have been dismissed in print as too "backwards" to accept agricultural innovations; closer study shows that once other constraints are removed, new techniques of demonstrated success are readily accepted and applied. Examples observed by this writer include adoption of new vegetables for urban markets, tree seedling nurseries as rural industries, rodent-proof wire chicken coops, and improved grain barn designs.
In evoking the "geographical personality" of rural Haiti, all of these aspects must be brought together and weighed against each other. The peasant is confronted with meeting the basic needs of his family from a very narrow resource base, while handicapped by a number of constraints. Some of these constraints are subtly embedded in Haitian society and polity, while others have emerged rather recently and are yet to be comprehended. Inasmuch as it traditionally insists upon particularizing, compartmentalized analysis, academia has failed to evoke a complete picture of contemporary rural subsistence in Haiti. This study makes tentative steps in a new direction.

A Final Word

In this work I have tried to characterize—to borrow from Thoreau—"the quiet desperation" of Haitian peasant existence, or at least some of the forces and factors that constrain them. Elsewhere it has been said, "The rich get richer, the poor have babies." The rural Haitian man and woman have babies. He stoops to plant and to sarclé or weed with his machete. She leaves the house before dawn, carrying a basket of perishable fruit upon her head that she will try to sell before dark. They, or their children, carry water—every day of their lives. They all search for fuelwood. They scramble to get pigs to raise and sell, while in the city imported frozen pork grows in popularity.
The topsoil of their rented land melts away, carrying profits with it. Their impatient landlord is also constable for their district and wears pistol on hip. They walk away looking for work ... and meet mirror images coming from the opposite direction. They try to sail away ... foreign governments often send them right back.

Haiti is a unique and colorful land and culture in many respects. Today, however, on the eve of the 21st Century, it bears an overwhelming distinguishing feature, its degree of human suffering derived from the coupling of extreme poverty with infringements upon human rights. There the sanctity of human life is often held in such low esteem that it can be violated with impunity, and so it is.

Can scholars working in Haiti turn a blind eye to these realities? Can they tiptoe past brutality on their way to ivory tower esoterica? Can they sterilize the humanity from social studies there by pleading a special dispensation for "scientific method?" Can a social scientist, so adept at analyzing sets of "data," examine the lives of people, while discounting what they say, what they think and not least, what they feel? Perhaps there is a time and a place to set aside conventional constraints in an effort to tell the story of "what it's like there."

Geography, solidly grounded in earth science, is largely a social science, in that it ultimately seeks to account for human behavior, made collective in social
constructs, though not approached as in sociology. Geography deals with the setting for the human drama, the milieu. It strives to explain "the why of where." The "where" is organized by place, by expanses of land. The "why" is much less visible. Its reassessment is frequently necessitated by the peculiarities of humankind. We have our work cut out for us.
BIBLIOGRAPHY

Abbott, Elizabeth
1988 Haiti: The Duvaliers and Their Legacy.

Acquier, Jean-Louis
1985 "Elevage," in Atlas d'Haiti,
Centre d'Etudes de Géographie Tropicale, CEGET-CNRS et université de Bordeaux III, Talence,
planche 18 of 32.

Ahmad, N.
1977 "Erosion Hazard and Farming Systems in the
Caribbean Countries," in D.J. Greenland and
R.Lal, eds., Soil Conservation and Management
in the Humid Tropics. Chichester, U.K.: John
Wiley & Sons, ltd.

Anglade, Georges
l'Université du Québec, 221 pp.

Aristide, Achille
1955 Quelques Aspects du Problème de la Population
En Haiti. Port-au-Prince: Imprimerie de l'Etat,
61 pp.

Augelli, John
1985 "Food, Population, and Dislocation in Latin

Barbour, M.G., Burk, J.H. and Pitts, Wanna D.
1980 Terrestrial Plant Ecology. Menlo Park, CA:

Bellegarde-Smith, Patrick
1984 "Overview of Haitian Foreign Policy and
Relations: A Schematic Analysis," in
Foster and Valdman, eds., Haiti Today and
Tomorrow: an Interdisciplinary Study. New York:

1985 In the Shadow of Powers: Dantes Bellegarde in
Haitian Social Thought. Atlantic Highlands

Bergey, Mike
Billard, Annick

Blaikie, Piers and Brookfield, H.C.

Blakeley, Thomas J.

Blaut, James M.

Blume, Helmut.

Boswell, T.D.

Bourdet, Yves and Lundahl, Mats

Brady, Nyle C.

Breslin, Patrick

Brey, James A.

Brookfield, Harold
Brown, Lester

Brutus, Henricot

Butterlin, Jacques

Butterlin, Jacques

Carter, George F.

Carter, V.G. and Dale, T.

Cascagnol, Robert
1984 interview, 24 August, 1984, Centre de Recherche et de Documentation Agricoles, Damien, Haiti.

Centers for Disease Control (CDC)


Courlander, Harold

Coursey, D.G.; and Haynes, P.H.

Critchfield, H.J.

Daly, Herman E.

Deffontaines, Pierre

De Regt, J.

Desrouillers, Joseph Bertrand

Deudney, Daniel and Flavin, Christopher

Devendra, C.

Ducasse, Joel
1986 "Quelle Agriculture?" Le Nouveliste, 4/17/86, Port-au-Prince, Haiti, pp.4-5.

Eckholm, Erik.

Economist Intelligence Unit (EIU)


Eicher, Carl K. and Staatz, John M.

El Mahgary, Yehia, and Biswas, A.K.

Ensminger, M.E.

Erasmus, Charles John

Evans, E.Estyn

Ewel, Jack.

Falcon, Walter P.

Fecho, Rhine
Felix, J.F.; Fuqua, M.; Fils-Aime, M. and Previllon, G.

Flavien, Etzer

Flavin, Christopher

———

Flavin, C. and Lenssen, N.

Fombrun, Odette R.

Food and Agricultural Organization (FAO)
1985 Production Yearbook FAO Statistics Series No.94 Rome, Vol. 38

———
1989 ...Vol.42
———
1990 ...Vol.43

Forester, Stephen

Fortuné, Ducheine

Foster, Charles R. and Valdman, Albert
Francois, Germain J.  

Fredrichs, Barbara  

French, Howard  

Furon, Raymond  

Gaignard, Romain and Tillous-Borde, Philippe  

Galloway, J.H.  

Garside, A.J.  

Geer, Thomas  

Gillet, M., Petithomme, B., and Roca, L.  

Girault, Christian.  
Gudeman, Stephen
1978 The demise of a rural economy: From subsistence to capitalism in a Latin American village.

Haiti Times

Hargreaves, George H., and Samani, Zohrab A.

Hart, John Fraser

Hayes, Denis
1977 Energy for Development: Third World Options

Haynes, P.H., Ferguson, T.U., and Wholey, D.W.

Heath, M.E., Metcalf, D.S., and Barnes, R.F., eds.

Higgitt, David

Hogan, P. et al.

Holdridge, L.R.

Holloway, S.R., and Pandit, Kavita
Honorat, Jean Jacques
1988 "Social Divisions," in Richard M. Morse, ed.,
Haiti's Future: Views of Twelve Haitian Leaders.
pp. 21-27.

Horton, Douglas
1987 Potatoes: Production, Marketing, and Programs
for Developing Countries. Boulder: Westview
Press.

Houry, Jean-Michel, and Pirovano, Jean-Pierre

Hudson, Norman W.
1983 "Soil conservation strategies in the Third
World." Journal of Soil and Water Conservation

Institut Haitien de Statistique et d'Informatique (IHSI)
1971 Recensement general de la population et du
logement, aout 1971. Port-au-Prince, Haiti.

1982 Résultats Preliminaires du Recensement General

1984 Statistiques Agricoles (Quelques renseignements
tirés des fiches agricoles: Année 1982),
Département de La Grande Anse, Port-au-Prince,
Haiti, 41 pp.

Jacks, G.V. and Whyte, R.O.
1939 The Rape of the Earth: A World Survey of Soil
Erosion. London: Faber and Faber.

James, Preston E.
1969 Latin America. 4th ed. New York: Odyssey Press,
947 pp.

James, P.E., and Martin, G.J.
1981 All Possible Worlds: A History of Geographical

Jent, C.H., Bell, F.F., and Springer, M.E.
1967 Predicting Soil Losses in Tennessee Under
Different Management Systems. University of
Tennessee Experiment Station bulletin no. 418.

Jolynce, Anne Laure
1986 "L'Ecole Nationale des Infirmières de
Port-au-Prince," Haiti Libérée, 5/12/86, pp. 1,8.
Jordan, T.G., and Rowntree, L.

Justin, Joseph

Kantner, Arthur.

Kay, Cristobal

Kermel-Torres, D.

Kimber, Clarissa

Kniffen, Fred B.


Krostitz, W.

Laguerre, Michel S.

Lanoy, Henry
Leighly, John

Le Journal du Commerce
1986 (Port-au-Prince) 3 November 1986, pp.2,5,8,9.

Le Nouvelliste

Locher, Uli

Lounsbury, J.F., and Aldrich, F.T.
1979 Introduction to Geographic Field Methods and Techniques. Columbus, OH: Merrill, 181 pp.

Lucier, Richard L.

Lugo, A.E., Quiñones Marques, F., and Weaver, P.

Lundahl, Mats


MacDonald, Ken
MacDonald, Scott B.

MacDonald, Scott B. and Fauriol, Georges A., eds.

MacFarlane, Dennis

Maguire, Robert
1979 Bottom-up Development in Haiti. Inter-American Foundation paper no.1, Rosslyn, VA: Inter-American Foundation, 63 pp.


Mangones-Dejean, Daniele
1986 Asst. director of IICA/OAS Swine Repopulation Project, Port-au-Prince, Haiti. Interview, 15 April, 1986.

Margaritis, Christian, and Pisani, Marie-Michèle

Marshall, C.F.

Martin, Geoffrey J.

Mathewson, Kent  
1987 "Sauer South by Southwest: Antimodernism and the  
Austral Impulse," in Martin S. Kenzer, ed., Carl  
O. Sauer: A Tribute Corvallis, OR: Oregon State  
University Press, pp.90-111.

Mathieu, Philippe, and Wolf, François  
n.d. "La Construction de Citernes, Une Solution  
Interessante Pour le Developpement Agricole des  
Zones Rurales de Morne d'Haiti," Centre de  
Salagnac, Haiti, mimeo, 6 pp.

McConnell, H.O. and Swan, Eugene, Jr.  
1952 "100 Creole Proverbs," in You Can Learn Creole.  
7th ed. Port-au-Prince, Haiti: By the Authors,  
109 pp.

McDowell, R.E and Hildebrand, P.E.  
1980 "Integrated Crop and Animal Production: Making  
the Most of Resources Available to Small Farms  
in Developing Countries," Working Papers – The  

McKenna-St. Jean, Marcia  
1986 field representative, CARE, Port-au-Prince,  
Haiti. Interview, May 1986.

McNair, Jim  
1991 "La Guerra de las Naranjas: Florida vs. Mexico  
por Citricos," El Nuevo Herald (Miami) 4/14/91  
p. 5B.

Meinig, D.W., ed.  
1979 The Interpretation of Ordinary Landscapes. New  
York: Oxford University Press, pp. 255.

Mellor, John  
1966 The Economics of Agricultural Development.  

Metcalf, Bob  
1989 "How to Build and Use Solar Box Cookers," Haiti  
News no.9 (June): 3-7.

Mikesell, Marvin  
1979 "The Association of American Geographers at 75:  
Current Status," The Professional Geographer 31  
(4): 358-60.

Mintz, Sidney W.


Moral, Paul


Morse, Richard M.

Murdock, George Peter

Murray, Gerald F.

Murray, G.F., and Alvarez, M.D.  

Mwandha, James; Nicholls, John; and Sargent, Malcolm  
1985 Coffee: The International Commodity Agreements  

Newland, Kathleen  

Nicholls, David.  

Nyerere, Julius K.  

Organization of American States (OAS)  

Olivier, J.  
1981 Réflexions Sur l'Energie en Sucrerie de Canne  

Palmer, Ernest Charles  

Paquette, Romain  
Peeters, Alice

Pierre-Charles, Gérard

Pierre-Jean, Luc; and Tremblay, Anne

Pierre-Noel, A.V.

Pieterse, M.Th.A. and Silvis, H.J.

Pimentel, David, et al. (5 others)

Pirie, N.W.
1979 "Food From the Leaves of Trees and Bushes," UNASILVA 31 (124): 11-14.

Pirovano, Jean-Pierre
1973 "L'Agriculture en Haiti," in Conjonction 120: 91-106

Plummer, Brenda Gayle

Porter, Philip W.

Price, Edward T.

Raper, A.F., and Reid, I.D.
Rolston, L.H.
1988 Research program on pests of sweet potatoes, Department of Entomology, Louisiana State University, Baton Rouge, Louisiana, Interview, April 1988.

Saint-Vil, J.

Sauer, Carl O.


Schery, Robert W.

Schumacher, E.F.

Segal, Aaron

Sepalage, B.P.
Shea, Cynthia Pollock

Simpler, A1

Simpson, James R.

Smil, Vaclav

Sorre, Max

Southgate, D., Hitzhusen, F., and Macgregor, R.

Spencer, J.E.

Stepick, Alex

Street, John M.

Streeten, Paul

Tasaki, E. and Bond, E., eds.
The Haiti News
1987 no.6 (summer 1987) pp.1-2.

Thomas, Clive Y.

Thro, A.M., Shock, C.C., Nelson, B.D., Peterson, F.J.,

Tomek, W.G., and Robinson, K.L.

Treaster, Joseph

Trouillot, Michel-Rolph

Twidell, John, ed.

Turner, Kernan
1990 "System forces Haitians to work in near-slavery," Sunday Advocate (Baton Rouge, LA) 5/13/90, p.1D.

Underwood, Frances W.

United Nations

United States Agency for International Development (USAID)
Vermeer, Don

Wagner, Philip W., and Mikesell, Marvin W., eds.

Walker, H.J., and Haag, W.G.

Weaver, J.H., Jameson, K.P., and Blue, R.N.

Weaver, Peter

Weinstein, B., and Segal, A.

West, Robert C.

West, Robert C.

Wharton, C.R.

Wheeler, K.S.

White, Allison
Wiese, H. Jean C.  

Wilentz, Amy  

Wilken, G.C.  

Witinok, P.M.  

Williamson, Grahame, and Payne, W.J.A.  

Wood, H.A.  

World Bank  


Wrigley, Gordon  

Yapa, L. and Zelinsky, W.  

Zimmerman, T.  
Zuvekas, Clarence, Jr.
VITA

Edward Cameron Britton was born in 1955 in Greeneville, Tennessee, home of Davy Crockett and of 17th president, Andrew Johnson. Attending public schools, Britton achieved recognition as a National Merit Scholar. From the University of Tennessee at Knoxville, in 1977 he received a B.A. in Geography, graduating magna cum laude, and was honored as Phi Beta Kappa. Mr. Britton, mindful of Mark Twain and Thoreau, sought to broaden his life experience in the post-undergraduate years. He worked in a variety of plain jobs, from hayfields, to factory assembly line, to suburban trash truck. He hiked frequently in the Appalachian mountains, practiced his French in Québec, and hitchhiked from Seattle to East Tennessee.

For three years he worked as a land surveyor before returning to the University of Tennessee in 1982. He received his M.S. in geography in 1983, and immediately came to Louisiana State University with an Alumni Federation Fellowship. Britton first went to Haiti in 1984, and returned to Haiti in 1986 with wife and infant daughter. At the end of five months of civil unrest, strikes, and interrogation by soldiers, a time punctuated by a bout of malaria, Britton returned to LSU. While completing his dissertation, he has taught French and geography at LSU.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Edward Cameron Britton

Major Field: Geography

Title of Dissertation: PEASANT SUBSISTENCE IN NORTHWESTERN HAITI: GEOGRAPHY, CULTURAL ECOLOGY, AND RURAL DEVELOPMENT

Approved:

William V. Davidson
Major Professor and Chairman

Daniel Feigl
Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

March 17, 1993