

AGRICULTURAL DEVELOPMENT IN CLEAR CREEK:
ADAPTIVE STRATEGIES AND ECONOMIC
ROLES IN A DOMINICAN SETTLEMENT

By

ROBERT WENDELL WERGE

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ABBREVIATIONS USED THROUGHOUT THIS DISSERTATION

AID	United States Agency for International Development
INCAP	Instituto de Nutricion en Centro America y Panama
OEA	Organizaci6n de Estados Americanos
ISA	Instituto Superior de Agricultura

PREFACE

I first visited Clear Creek, where this study was undertaken, in the summer of 1972 while working as part of an interdisciplinary research team headed by Dr. Gustavo Antonini of the University of Florida.¹ In order to arrive at the settlement from the crossroads town of River where we stayed, a colleague and I rode several hours on muleback through wind-swept and denuded hills. From a ridge above the settlement, the lush green valley floor of Clear Creek appeared in sharp contrast to the distant mountain forest which was heavily scarred by the clearings of swidden farmers. In spite of the distracting, cold rain which was then falling, I was struck by the counterpoint of "primitive" and "modern" farming systems. I remarked to my companion that this rural area (campo) would be an excellent location for an in-depth study.

My return to the settlement nearly a year later was made possible by a grant from the Foreign Area Fellowship Program, now a part of the Social Science Research Council. After some negotiation, I was able to rent a small, abandoned house which, with some renovation, became habitable once again.

The preliminary months of my residence were spent slowly learning to cope with a new language, mud, and unexpectedly cold

¹The names of places have been changed and Anglicized without, hopefully, losing their true flavor. Likewise the names of individuals have all been altered.

weather as well as becoming integrated into the life of the settlement. But I soon discovered that life in the settlement, for most people, occurred in the context of a cluster of households, to one of which I was expected to affix myself. The process of acquiring membership in such a cluster was speeded by the addition to my household of several children belonging to my neighbor and an American woman who was considered my wife. These additional members of the household allowed me to interact equally with other households in the cluster.

The focus of my study gradually expanded as my life in the settlement broadened but my main concern in retrospect seems to have been symbolized by my own house garden, half of which was planted in subsistence crops and half in the commercial vegetables that some of my neighbors grew. Data on commercial farming was easiest to collect since it was going on all around my house. Measuring work input was done by observing laborers; short questionnaires elicited production figures and costs, though it was often difficult to obtain accurate responses for past years. This was due more to the fact that farmers kept no records of cash or credit transactions; though all of them knew, for example, if they were in debt to the supplier and to the store owner, they were not certain of the amounts.

In January and February of 1974, I began to have extensive contact with swidden farmers, some of whom I had known from my first visit in 1972. The difficulty of getting to the remote swidden clearings was partially mitigated with the help of neighbors who loaned me their mules, but most fields could be

reached only by narrow footpaths. The difficulty of figuring yields in the clearings was partially met by mapping out plant densities and combinations, then weighing samples from each type of plant in the combination. In collecting data on work input and field size, I worked more intensively with a small number of slash and burn farmers (about ten) and relied less on short questionnaires. Since swidden farming was illegal, informants with whom I had less acquaintance were suspicious that I was in the employ of the government. This was especially true after Gerald Ford became President as I had told many people I worked for the Ford Foundation.

Preliminary data on dietary intake, household expenditures, salaries, marketing patterns and other subjects reported here were collected in informal conversations which gave me an idea of what were some of the variables involved. For example, it was in this way that the importance of the rifero (lottery seller) came to my attention, an element which is usually overlooked in socio-economic studies because gambling is viewed as a "game" rather than "economic" behavior. From such conversations I would make out a mental list of questions which I could ask in a variety of situations; I constantly used my notebook, so that residents, flattered by the attention, often reminded me that I should write down both the accurate and inaccurate information they gave me, lest I forget. During my stay, I conducted two household surveys, concerning population, labor, agricultural practices, and land tenure.

Alternating between formal and informal situations allowed me to constantly check and recheck information for accuracy and

reliability, which was particularly important in the case of swidden activity. In addition, event analysis was carried out in situations including diverse events such as bean harvests and Christmas fiestas. Genealogies of each household and oral histories were collected also.

Throughout my fieldwork and the period of study and writing which came before and after, I have received the support and guidance of a large number of persons whose help must be acknowledged. Among these are Dr. G. Alexander Moore, who, as chairman of my committee and mentor, has given constant encouragement. His visit to the Dominican Republic in the spring of 1974 gave me support and helped to clarify some of the issues involved in my study. Dr. Solon T. Kimball, under whom I have taken many courses, urged me to work on the integration of anthropological concepts and agriculture, while Dr. Hugh Popenoe has always been generous with his financial help and time for the same. In his study on swidden agriculture, Dr. William Carter provided a framework for examining slash and burn farming. Dr. Larry White was especially helpful with his editorial suggestions in this manuscript. Dr. Gustavo Antonini, as I mentioned above, introduced me to both the pleasures and possibilities of work in the Dominican Republic. Frank Moya Pons of the Universidad Católica, Madre y Maestra in Santiago and Cesar Garcia provided me with key contacts in Dominican intellectual and academic life which helped me to fit my study into the larger context of Dominican studies.

In addition, there are a number of individuals who helped me over many periods of discouragement and impatience and who

shared many of my happiest times. Though this list of their names is markedly incomplete, it must include: Doña Ilma Espailard de Blanco, Mark and Chia Feldman, "Blas" Rosario, Sally Lawson, Carlos Moreno, Richard Spaulding, Virginia Vega, Charlotte Doria, Michel Buisson, Alison McClure, Bonnie Sharp, Helmut Widmann, and, an excellent typist, Judy Johnson.

Also I must acknowledge the long support of my mother, Mrs. Elna Werge, and my brother, Dr. Thomas Werge who, through my various wanderings, have always provided me with their love and guidance.

But most of all, I shall always remain in debt to the people of Clear Creek whose lives form the substance of this dissertation and who gave me more than I can ever hope to return. It was they who, through their humor and warmth, helped me to ease my loneliness and carry out my study. One old woman who came to refer to me as her most blond son (el hijo mío, lo más rubio) characterized their outlook with her proverbial reply to the question, "How are you?" (Como está usted?). "Living," she would say with a shrug of the shoulders, adding after a pause, "but to live is a great thing." (Vivo, pero vivir es una gran cosa).

It is to the people of Clear Creek that this dissertation is dedicated.

Abstract of Dissertation Presented to the Graduate Council of
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AGRICULTURAL DEVELOPMENT IN CLEAR CREEK:
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By

Robert Wendell Werge

Chairman: G. Alexander Moore
Major Department: Anthropology

Clear Creek is a small settlement in the central mountain range of the Dominican Republic which has, over the last decade, widely adopted modern farming methods, including use of irrigation and agrochemicals to produce commercial vegetable crops for urban markets. Nevertheless, traditional methods of swidden farming coupled with the traditional household organization and division of labor continue to be utilized by part of the population. These two agricultural systems are contrasted as adaptive strategies which convert different sets of natural resources into articles of consumption. Contrasts between these strategies include their use of energy, spatial distinctions, mode of production, and historical development.

A major effect of agricultural development has been the wide adoption of new non-agricultural economic roles which form links in the flow of cash and goods between the settlement and the outside. These roles include the store owner,

lottery seller, government worker, and migrant. Another effect of the development has been the growing consolidation of land by large growers and by outside interests.

This study finds that agricultural development is linked to the inability of small farmers to remain in commercial production while, at the same time, access to swidden farming, an efficient strategy in terms of caloric return, is becoming increasingly more limited by environmental and political constraints. Thus, a long term result of agricultural development in Clear Creek is the relegation of much of its population to marginal cash employment.

CHAPTER ONE

INTRODUCTION

What is the effect of rapid agricultural development upon rural populations in the Dominican Republic? This is the central question posed by this study. This thesis attempts to answer that question by examining the experience of Clear Creek, a small, rural settlement near the town of Constanza in the mountains of the Cordillera Central. A number of agricultural innovations, including new crops, agrochemicals, and marketing methods, were introduced into Clear Creek in 1967. While some households have continued to farm in the traditional slash and burn manner, many others have begun to use new production techniques over the past eight years. Still others have taken up other specializations such as lottery sales or have migrated.

This study shows that such changes have resulted in the benefits of development being spread unequally among the population and that economic disparity within the population is growing. It seems clear that the world wide food and energy crises will make that inequality even more pronounced.

This study argues that it is not the new technology which causes this growing disparity, but rather a series of constraints, environmental, economic, and political, which limits the ability of more than half the households to acquire and utilize properly the agricultural innovations. Further it will be shown that these same constraints are making it increasingly

difficult for farmers to utilize the traditional subsistence methods. Caught by the limitations imposed on both systems, much of the rural population must seek to make a living by means other than agricultural production. At the same time, the agricultural resources of the settlement are becoming increasingly concentrated in the hands of large farmers who are able to maintain access to the new technology in spite of rising costs and shortages.

This first chapter introduces the theoretical framework of this study which is largely based upon the concept of community proposed by Arensberg and Kimball in their seminal work, Culture and Community (1965). This has already been employed by Walker in a study of Constanza itself (1972). As explained in the second chapter, Clear Creek is not a community in the traditional sense, but is instead a rural settlement tied to a number of urban centers. Nevertheless this approach focuses upon the structure and process of human interaction as it occurs in natural groupings over time and space. This natural history approach is a fruitful tool for understanding any form of social or economic change.

Within this general frame of reference, however, this study is concerned with a specific form of change, namely that of agricultural development. The concept of agricultural development, along with two others in the title of this thesis, adaptive strategy and economic role is central to this study. Each of these concepts will now be discussed and related to other concepts used in the ensuing chapters.

The concept of adaptive strategy has proved to be useful for the analysis of both traditional and modern economies.² Bennett's book Northern Plainsmen shows how cultural groups have developed distinctive strategies for coping with a specific ecological setting. By adaptive strategy, he means the organization of activities aiming at the conversion of the natural environment into natural resources which are used for subsistence and profit. In these terms a strategy is an observable pattern of social, technological, and economic interaction adjusted to a particular physical environment by a particular culture or subculture.

Bennett claims that strategies arise out of both the choices and limitations faced by men who are attempting to cope with their environments and make choices between the available options. He writes:

Often in environments with marginal resources, the alternatives are few, decisions are difficult, and a general constraint is exercised over human action. In these situations, one might speak of ecological or economic determinism as an explanation of particular social phenomena But the process is not a simple one of automatic controls over human behavior. Even in ecologically constrained situations . . . people are confronted with choices and need to make decisions. In addition, human wants and conceptions of action may or may not conform to reality, and certainly man always conceives of possibilities other than the inevitable or most probable (1969: 14-15).

²The guiding discussion of this concept is found in Bennett's Northern Plainsmen (1969) in chapter 1, "Adaptation as a Frame of Reference." Bennett amplifies on Thomas Hardings' article "Adaptation and Stability" in Evolution and Culture (1960). More materialistic treatments are found in Marvin Harris (1960) and Yehudi A. Cohen (1968).

Adaptive strategies, then, are taken to be the result of history and culture as well as the direct interaction of man and environment.

At present, Clear Creek is a settlement which exhibits two major and quite distinct adaptive strategies. Slash and burn agriculture, the method of farming which first attracted settlers some 60 years ago, continues to be practiced in the hills. Vegetable production, utilizing irrigation, agrochemicals, and modern marketing channels, has been practiced in the narrow valleys for the past eight years.

The differences between the two adaptive strategies have several facets. Various dichotomies call attention to the contrast between the two strategies in terms of cultural attitudes, relationships to markets and forms of cultivation: traditional vs. modern, subsistence vs. commercial, and extensive vs. intensive. However, the findings of this study indicate that the contrasts between the organization and flow of energy in both of these adaptive strategies give a very clear insight into why these two systems coexist for the time being and why one of them is replacing the other as a predominant economic factor.

The principle of energy (the capacity to do work) has figured highly in theories of evolutionary change and in the analysis of biosocial systems (Cottrell 1955, Odum 1971, Rappaport 1971, Sahlins and Service 1960, White 1949). In this thesis, the concern is to demonstrate how the source and amount of energy utilized by farmers varies significantly

from one strategy to another. The measurement of the energy involved also provides a means, besides that of cash income, for gauging the efficiency of each strategy.

In both swidden and commercial farming, the control over energy is a crucial factor in the farmer's ability to manipulate the environment. Under slash and burn agriculture, for example, the farmer attempts to control energy by recruiting labor out of his own household. Because this same household consumes what it produces, the flow of energy which this system represents is relatively closed. In contrast, large scale commercial farming represents an open energy flow, one in which great reliance is placed on obtaining energy supplements from national and international markets.

The organization and flow of energy in an adaptive strategy results from the level and type of technology employed along with the pattern of social and economic interaction geared to production and distribution. Taking the cue from Chayanov (1966) and Sahlins (1972), these patterns of interaction are called modes of production. In both of the strategies discussed here, these modes of production are quite distinct.

In slash and burn agriculture, the household is the mode, being the unit of both consumption and production. At the other extreme in capitalist farming, the mode of production is a more complex system in which there is an occupational division of labor between managers and workers, the latter being recruited by the payment of cash wages. The small scale commercial operation falls between these extremes, recruiting part of its labor

force from the household and part from hired workers (Figure 1).

A technology does not require any particular mode of production in and of itself. Bennett's discussion of a Hutterite community as a modern farming enterprise aptly makes this point, as would a similar analysis of a Chinese commune or an Israeli kibbutz. Capitalist farming in Clear Creek, it should be emphasized, is not the inevitable result of simple technological change. Rather, it results from the combination of technological change occurring in a particular cultural system under a series of recognizable environmental, political, and economic constraints.

Agricultural development, another phrase in the title of this study, is usually used to mean the application of modern technology to increase the production of crops. The term, development, here should not be construed as implying that modern technology or larger yields are innately beneficial to the producers and consumers of agricultural production or to the culture as a whole. It is used simply to designate change from a low energy-using agricultural system to a high energy-using one.

Modern agricultural technology is usually but not exclusively based on fossil fuel subsidies. Composting is an example of an innovation not using fossil fuels but already available nutrients in a more efficient manner. However, in Clear Creek, new techniques rely almost entirely upon fossil fuel inputs: agrochemicals, motor transport, and a whole host of agricultural goods which flow from modern industry. In this sense, the settle-

Modes	Slash and Burn Farming	Small Scale Commercial Farming	Large Scale Commercial Capitalist Farming
LAND TYPE	marginal hillsides	valley bottomland	valley bottomland
LAND USE	cyclical, eventual abandonment to pasture	semi permanent/permanent	permanent
LAND TENURE	squatter/comunero	inherited/bought	bought
LAND UNDER CULTIVATION	scattered fields	small holdings near house	large, consolidated holdings
LABOR	household plus exchange of labor	household plus hired labor	hired labor
ENERGY SOURCE	manpower	manpower, animals fossil fuels irrigation	manpower, animals fossil fuels, irrigation
CROPS	subsistence and a strategic cash crop	subsistence and cash crops	cash crops
STRATIFICATION	egalitarian	two levels: haves and have nots	wide gap between haves and have nots
ENERGY FLOW	simple and closed	oscillation between simple and complex	complex and open

FIGURE 1

Characteristics of modes of production in Clear Creek.

ment is said to be developing agriculturally.

An integral aspect of agricultural development as it unfolds in the settlement is the emergence of economic roles which are distinct from those involved in either of the two modes of agricultural production. Economic role is used here to mean occupation or job: that is, a set of behaviors, forming an identifiable unit, which are functionally specific to a particular position in the economy. In slash and burn agriculture, economic roles are frequently prescribed by other statuses including age, gender, marital status, and parenthood. For example, the male head of household is the principal farmer whose helpers are his unmarried sons. In adopting a more open energy system, however, such economic roles are taken out of the household context. In this new situation, the functions of such roles, for example that of middleman, rifero (lottery seller), government official, and the special case of migrants become important behavioral units whose recruitment is not prescribed by social statuses. For example, lottery sellers in the settlement include men, women, and even a child, a 14 year old boy.

New economic roles supply linkages in the new flow of energy and cash through the settlement. They exist as alternatives for individuals who give up, sometimes temporarily, traditional subsistence farming, but who become neither commercial farmers nor daylaborers. It will be seen, however, that these roles supply only a limited income, less than \$400 per year, which is roughly equal to that earned by day laborers.³

³All monetary values expressed in this study are given in

Thus many individuals find themselves relegated to a low income level from which it is difficult to escape.

However, if an individual or a household is able to diversify economic roles, large economic benefits can result from the ability to parlay losses in one endeavor against gains in another. The adaptive strategy of commercial and capitalist farmers involves an attempt to diversify their crops, economic roles and investments so that when hard times fall resources can be shifted from one activity to another. The farmer who is the owner of a store, a truck driver, a backer for a lottery, and a cattle owner is much better equipped than one who relies solely upon growing two vegetable crops a year. This diversity parallels that found in slash and burn farming where the farmer attempts to diversify his crops and holdings to spread around his risk.

The chapters which follow build a framework for the central point of this thesis, namely, that the actual and potential benefits of agricultural development in Clear Creek are being spread unequally through the population. This results not from the nature of the new technology itself but from the type of cultural system into which it has been introduced. Among the variables operating in that system are constraints imposed on the population by the environment, economics, and politics.

terms of the Dominican peso, written by the \$. Officially \$1.00 RD = \$1.00 US, but in fact the values fluctuate. During the period from August 1973 to February 1975, the \$1.00 RD was exchanged on the black market at a low of \$.86 US to a high of \$.91 US.

The thesis is developed by describing and analyzing the social and economic organization, adaptive strategies, economic roles, and socio-ecological constraints present in the settlement. Chapter two is concerned with the social and economic organization of Clear Creek. It concentrates upon the interaction of environment and kinship in defining the system of land tenure and household structure. Historical background is drawn into the discussion to give a necessary time perspective to the changes the settlement is undergoing in terms of land use and the household.

The third and fourth chapters describe the two major adaptive strategies whereby the Clear Creek population converts its region's natural resources into usable produce and goods. These strategies are slash and burn farming and irrigated vegetable production, the latter also being referred to as commercial farming. Within commercial farming, a division has been made between large and small scale producers, as may be noticed in Figure 1. Urban based outsiders who have recently bought land for flower and vegetable production are referred to as capitalists. Since they seldom visit the farms, their holdings are run by managers. The line between small and large scale producers is made at two hectares of irrigable land; those holdings above two are referred to as large and those holdings below two are referred to as small. At the same time, it is shown that the differences between large and small growers are more complex than simply a matter of scale of production (Figure 1).

Chapter five discusses economic roles in the settlement which exist outside of these modes of production. These roles exist as important options for households as agricultural development takes place. Essentially they act as alternatives to daylabor for much of the population which does not have sufficient land to enter small scale commercial farming. But the low cash return from such economic roles disallows the build-up of capital which, not incidentally, reinforces reliance upon the lottery as a means of obtaining a large amount of money at one time. When combined with commercial farming, however, these same roles lead to the better control of energy and cash flow by large scale farmers.

Chapter six shows how participation in commercial agriculture is limited by factors of environment, economics, and politics and how these limitations are becoming increasingly stringent. These constraints, along with the tendencies described in the previous chapters, will be shown to favor large-scale enterprise. It will become clear that without some form of control such enterprises promise to take an increasing share of the settlement's resources. The last chapter draws some conclusions about the future of Clear Creek and other settlements in the Dominican Republic which are being affected by agricultural development.

CHAPTER TWO

THE HOUSEHOLD AND LAND: SOCIO-ECONOMIC CHANGE IN CLEAR CREEK

This chapter is concerned with the socio-economic organization of Clear Creek and the manner in which this organization is changing under the impact of agricultural development. The household is the basic unit of socio-economic organization in the campo; it forms the mode of production in slash and burn farming and is the critical unit for the settling of new territory and the division of old land.⁴ Thus, the household links changes which occur in the pattern of land use with alterations in the pattern of human interaction. Thus a major focus of this chapter is on the changing structure of the household itself.

The household is a group of persons residing in a particular physical setting, a house and a yard, which is related to the natural environment in a particular manner. The first part of this chapter, then, is a general discussion of the environment in which Clear Creek's households are found. This is followed by a description of the land tenure system which first brought settlers to exploit this environment. Land tenure is a crucial link to understanding the adaptive strategy of slash and burn farming. The following discussion shows

⁴The definition of household used here is that of Gonzalez (1960): a group of persons sharing common residence and responsibility for economic cooperation and the socialization of children.

that a discrepancy existed between the legal system of land-holding, terrenos comuneros, and the actual practices of land tenure which provided an extremely flexible basis for the type of farming which was customarily practiced by the settlers. This flexibility has largely disappeared with an increase in population and its concentration upon the valley floor where each household has a mean holding of roughly one hectare but where the mode is less than .5 hectare.

In the early days of the settlement, houses were widely dispersed, but as pressure on the land has increased, households have developed a cluster form of settlement, like that found elsewhere in the Republic. The manner in which these clusters are created is examined in some detail to reveal the nature of reciprocities and tensions within them. Tensions arise from the need for each household to maintain itself as a unit and the need to be connected to others in times of difficulty.

Household clusters, however, are avoided in socio-economic patterns of large farmers, those owning more than two hectares of bottomland, who are engaged in irrigated vegetable production. Escaping the reciprocities of the cluster, these farmers build their homes on land which they have purchased themselves. While subject to redistributive pressures, large farmers use such pressure to their own benefit without being trapped into a cluster system. Most significantly, since these farmers do not rely upon their own households for labor, they begin to adopt attitudes which limit the size of their households by practicing birth control or by educating their children out of

the settlement into urban employment.

These patterns of change reflect upon fundamental differences in the adaptive strategy of slash and burn farming vs. the adaptive strategy of irrigated vegetable production. These differences are reflected through the household onto the pattern of human interaction and onto the physical landscape. But change is effected unevenly by households since constraints of environment, economics, and politics increasingly limit access to new resources and technology to only a proportion of the population, and especially to the five households of the large commercial farmers and the two large capitalist farms run, not from a household, but from an office in Santo Domingo.

Clear Creek is an agricultural settlement high in the central mountain range of the Dominican Republic (Figures 2, 3). It is composed of nearly 700 persons who live in 126 households formed over the past 60 years in what was once heavily forested wilderness. The official borders of Clear Creek define it as a paraje of the section (sección) of River, part of the municipality (municipio) of Constanza in the province (provincia) of La Vega. The boundaries of the paraje contain roughly some 5,000 hectares, though the recent addition of Deep Gorge to its borders has enlarged this considerably.⁵ This was only one of a series of boundary changes which occur periodically, making for considerable confusion among researchers and residents alike.

⁵The unit of land area commonly used in the Dominican Republic is the tarea which equals .0625 hectare. Throughout this dissertation, all calculations are in terms of hectares.

In 1952, for example, Clear Creek was affixed to Constanza, a redistricting against which its inhabitants continue to complain. Some 82% of the settlers who came to this area from the outside were from Jaravacoa and they feel that the Constanza connection deprives them of the political advantages which kinship ties brought them in their natal community.

The settlement's isolation is one born of difficult terrain and, until the 1950's, the distance from secondary roads. While geography cut the settlement off from each commerce with other regions, it also created divisions within the settlement (Figure 3). Four of the valleys of Clear Creek, Pretty Creek, Pines, Goat, and Nuts, follow tributaries of the same river system and each tributary is flanked by narrow strips of bottomland upon which irrigation is possible. These valleys are linked to a fifth, Black Stone, which lies outside Clear Creek's political boundaries but which is tied to it by agricultural patterns, historical development, and intermarriage.

In contrast, Deep Gorge is separated from these valleys by a high and uninhabited watershed, crossed only by a steep, dangerous mule path. Deep Gorge contains no irrigable bottom land and its houses are often built along ridgelines, a pattern not followed elsewhere. Little visiting takes place across the watershed except for special events such as the annual cock-fight held in Pretty Creek between the men of Deep Gorge and those of the other valleys. Further, Deep Gorge is connected closely by mule path to settlements which lie below it in the province of Bonao. Much of its coffee and beans, the only cash crops, is sent directly to Bonao, by-passing Clear Creek's

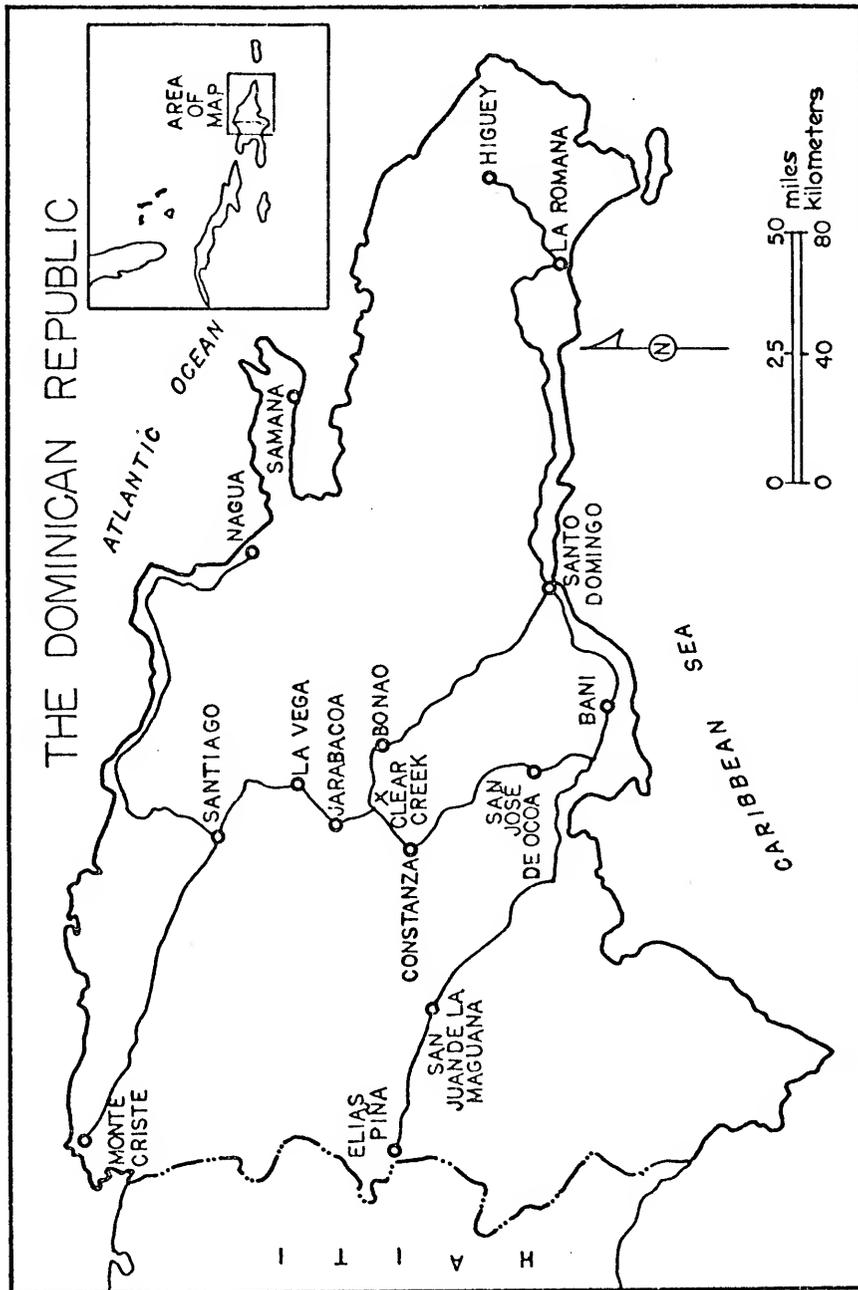


FIGURE 2

Location of Clear Creek in the Dominican Republic.

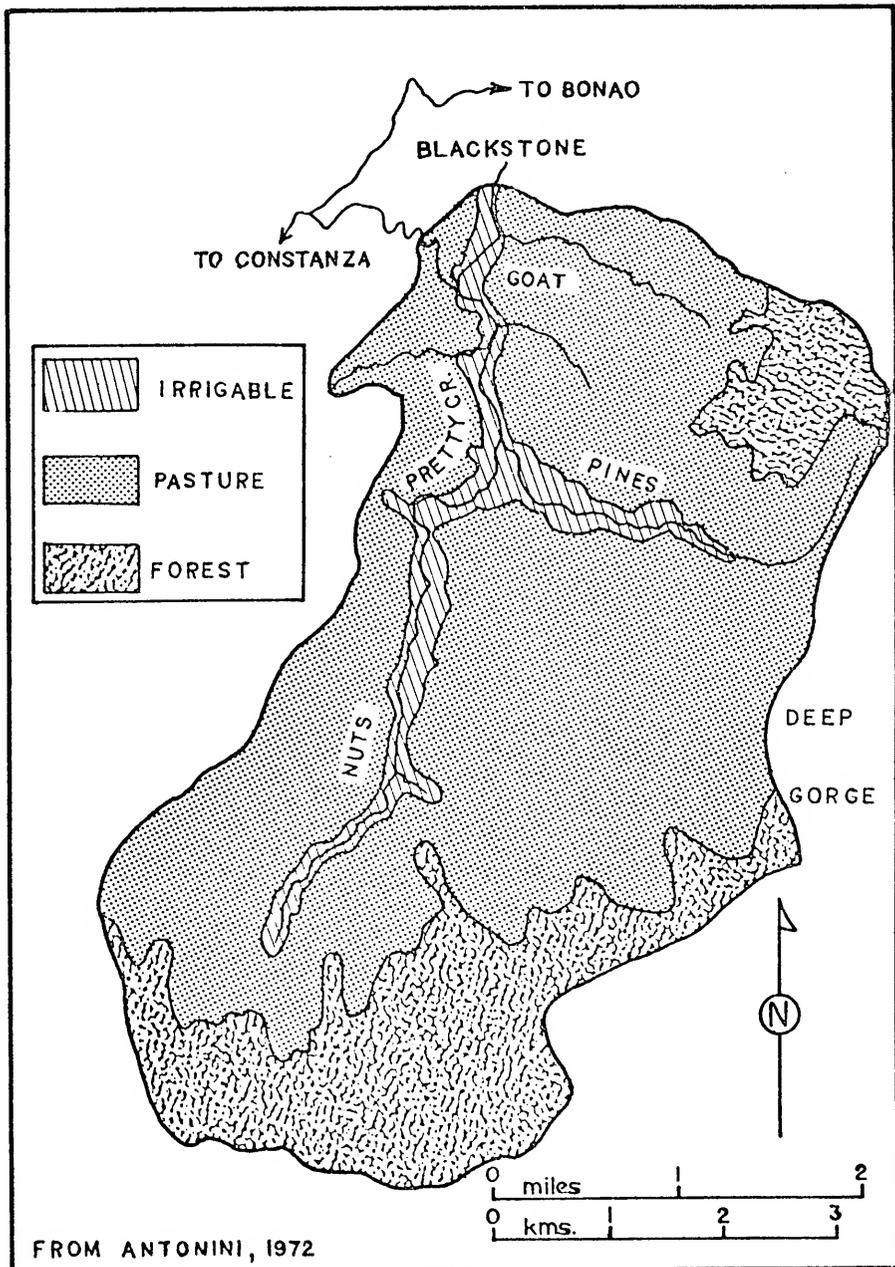


FIGURE 3
Landuse in Clear Creek.

marketing channels.⁶

Political and geographical boundaries in Clear Creek, thus, fail to coincide, a point made clearer when the external relations of the settlement are examined. The settlement lies six kilometers on a barely serviceable road from the main Constanza highway. At this juncture, the traveler is an hour by public car from Bonao and forty-five minutes from Constanza which lies in the opposite direction. Not only is Bonao a much larger city,⁷ it is also a gateway to other regions of the nation, whereas Constanza, since the road to San Jose de Ocoa has fallen into ruin, is a dead end.

From Clear Creek, persons go to or past Bonao five times as often as they go to Constanza. This is especially true in regard to the marketing of produce, visiting doctors, and recent permanent migration. Commercial farmers may buy their supplies in Constanza, but they market produce in the large central markets of Santo Domingo. Individuals can attend to some government related matters in Constanza, but dealing with

⁶Owing to this ecological and social division, my work concentrated upon the 126 households in the four valleys of Pretty Creek, Nuts, Goat, and Pines. Unless otherwise mentioned, data presented includes only these localities.

⁷The three largest cities in the Dominican Republic in 1970 were: Santo Domingo 671,402, Santiago 155,151, and San Francisco de Macoris 43,941. La Vega was seventh with 31,085 and Bonao had 20,159. In contrast, Constanza, the town, has a population of about 4,000.

Of a total Dominican population of 4,011,589 some 40% is considered to be urban. In the municipality of Constanza, only 12% of the population is considered to be urban. (Orlando, 1972: 26, 28, 52; Walker, 1972: 12)

institutions such as the courts or the agricultural bank often means going directly to La Vega. Constanza operates as only one pole of Clear Creek's external relations. Links of kinship, economics, health services, and migration form functionally distinct connections with a variety of urban centers.

Maintaining such ties is vitally necessary to contemporary Clear Creek for, as a campo, it lacks the complement of institutions and roles vital for the creation of a community (Arensberg, 1965). The people of Clear Creek use the word campo to describe the area in which they live and work, never community (comunidad). Only a limited number of institutions are represented. There is a rarely used church, a school, nine small stores, a pool table housed in a shed; but there is no clinic, no bar, no government offices, no brothel, no police station, and no government services in terms of water, electricity, or sewage. Also the list of cultural representatives is only partially complete; there is a sheriff (alcalde) but no police, a native curer (curandero) but no nurse, teachers but no priest, retailers but no wholesalers. Furthermore, the existing institutions and roles are dispersed, like the settlement pattern itself, isolating the major symbolic centers of life: the store, the church, the schools, and the house and yard.

Clear Creek exists, then, in dynamic and essential counterpoint to an urban center or centers. The interaction of campo, hinterland, with pueblo, town, forms the traditional Dominican community; like the ying and yang of Chinese philosophy, they form a complete whole only when taken together. Walker's study in Constanza focused upon events within the town while

this study complements it by focusing upon events in the countryside (Walker, 1970, 1971, 1972).

Clear Creek's relationship with urban areas has become increasingly predicated over the last decade upon the distinctiveness of its agricultural produce. The cabbages and other vegetables raised here thrive in the moist, cool climate while the autumnal bean production often hits the city markets at a time when no other region is harvesting. The climate of the municipio is famous throughout the country for being cool and invigorating.

The first settlers who came to Clear Creek from Jaravacoa arrived at a place which was colder, more rainy, more fertile, and less hospitable than the one they had left. Those who remember the Clear Creek of that era agree that it was a most ugly place, filled with dark and forbidding forests through which mule paths were only narrowly scratched. Only as the forest has been cleared has it become, for then, a livable environment.

The altitude of the settlement, about 1050 meters, puts it 500 meters above Jaravacoa. An even more dramatic contrast can be made with Bonaó which, only 17 kilometers away, is at 157 meters. The change in altitude is very abrupt and is even more so if one considers the mountain 1823 meters high which overlooks the narrow valleys of Clear Creek. Heavy clouds blow often along the scarred face of this steep slope, warning of imminent rains. The clouds themselves are formed when prevailing winds riding easily over the hot lowlands strike against

this portion of the central mountain range.

The altitude's effect upon rainfall and temperature gives the Constanza region a climate unique in the Dominican Republic. The annual average rainfall of some 1,071 mm. is more than any other area except the Samana peninsula. This is unevenly distributed throughout the year as data collected in River in 1973 shows (Figure 4). While drier months are usually expected in March through July, there is great fluctuation in rainfall from year to year. In January 1973, for example, it rained 40.0 mm., whereas in the following year the monthly total stood at 136.4 mm. It is this variability which limits production in Clear Creek rather than any water deficiency as such.

Temperature is less variable than rainfall and remains throughout the year more in a temperate than tropical range (Figure 5). Combined with the rains of December, January, and February, this makes for an uncomfortable winter as numerous cases of the common cold (^(a)el gripe) attest. During this cold season, women are kept busy brewing home remedies from plants gathered in their extensive herb gardens.

In other seasons, as elsewhere in the mountains, the coolness of the climate is viewed as a distinct advantage. The climate is described as being cool rather than cold when comparing this region with others. By contrast, the heat and dust of the lowland cities, especially Bonao and Santo Domingo, are pointed out as reasons against migrating from the area. Confirming this view is the increasing number of wealthy residents of the capital who have built summer homes in Black Stone and

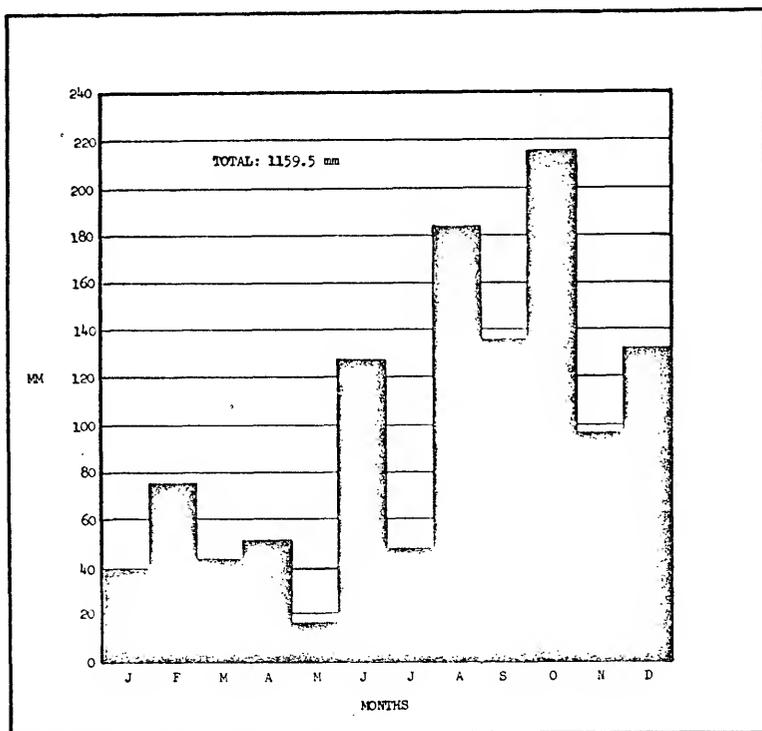


FIGURE 4

Monthly rainfall, 1973, weather station in River, Constanza.

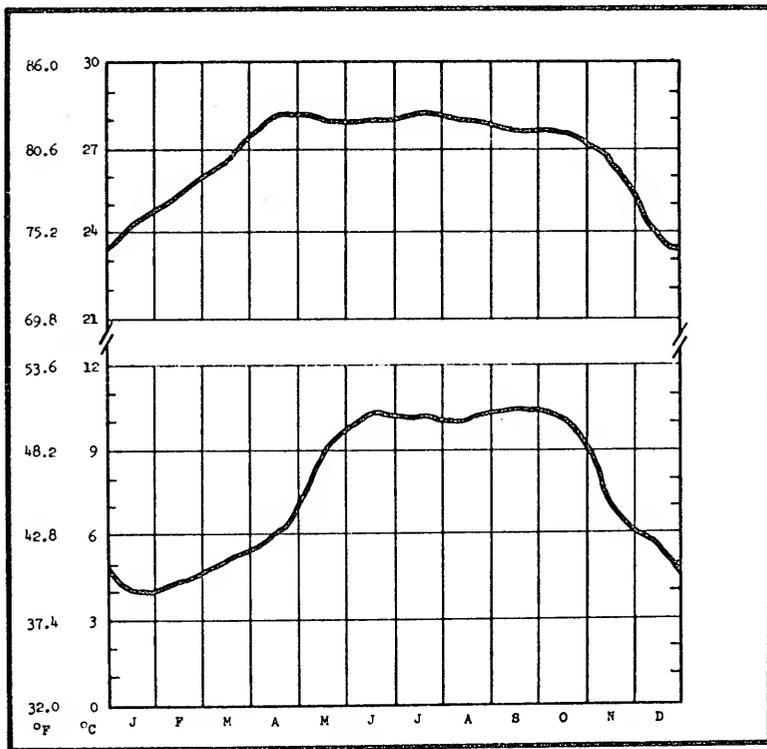


FIGURE 5

Average high and low monthly temperatures
1970-1974. Constanza, Dominican Republic.

River where they vacation on weekends and in the warmer months.

Change in climate presented the early settlers with a new set of farming variables. Tobacco, then an important cash crop in Jaravacoa, could not be grown successfully in Clear Creek nor did planting seasons coincide with those in the old farming area. Nevertheless, these factors were outweighed, at least for those farmers who stayed, by the abundance and the fertility of the land. Though exaggerating their first yields, the old settlers still warm quickly to the task of describing their early bean harvests and the loads of root crops they took back to their families in Jaravacoa. These harvests were certainly aided by the thick ash left from burning the virgin woods, by the absence of pests which came along later, and by the good valley bottom-land.

Though, as shall be seen later, there is an intricate and complex system of soil classification employed by farmers in Clear Creek, they agree there are two main types: that of the hills (loma) and of the valley (llanos). Soil maps of the region reveal the basic distinction between alluvial deposits laid down by intermittent flooding in the valleys and soils of volcanic, but principally metamorphic, origin in the hills (OEA 1967). This latter group reveals a thin layer of humus beneath which lies either a hard red clay or a rocky substructure. While the valleys support permanent cultivation, the hills are abandoned to grass and scrub after being farmed and are given over to cattle production. This tendency is particularly accentuated in Clear Creek where the steepness of hill-

sides inhibits their being used in the kind of dryland farming practiced elsewhere in the municipio (Walker 1972).

This combination of soil, temperature, and rain creates a natural vegetation cover listed by Holridge as being a wet mountain forest. But in Clear Creek there are two distinct forest complexes. An extensive pine forest, once more vast than it is now, contains a large number of Pinus varieties, including the indigenous occidentalis. These forests were heavily logged during the Trujillo era. The other complex has as its most distinctive component the manacila palm (Euterpe globosa) and a wild variety of ferns, lichens, mosses, and epiphytic flowering plants. Clear Creek lies astride the dividing line, as it were, between these two vegetative zones.

The land use zones of Clear Creek, then, are valley bottomland, forested hills, and hills converted from forest into pasture (Figure 3). Political lines being of little consequence, the amount of land exploited which is either in pasture or forest is much greater than that included in Clear Creek. The hills beyond Goat and near Blue Mountain, for example, are regularly farmed by slash and burn agriculturalists from Clear Creek as are some regions of Deep Gorge.

The means by which these farmers and the original settlers who came to Clear Creek got access to their lands is a complex matter. Land tenure is, after all, as much a function of a person's relations with his fellows, defined by law and custom, as it is a person's relationship to a piece of land. The system of tenure involved in slash and burn farming evolved

out of the historic condition of an expanding population living along a forest frontier. In the initial phase of settlement, colonists cleared what land they needed and acquired rights over it by using it. In some cases colonists would purchase the right of usufruct for some land over which someone else had title. In all cases, the limitations on use of land were defined more by household labor force and family need than by formal property boundaries.

Clear Creek, 50 years ago, was a frontier; the sentiments expressed concerning the forest, its dangers and darkness, are common to folk who must subdue the woods in order to survive (Turnbull 1962, Miller 1956: 1-15). Since colonial times, the frontier was far from formal seats of government and was scattered wherever vast strands of forest dominated the landscape. Thus, the type of tenure that developed had only tangential relations to national law; in fact, national law must be seen as an attempt to control and formalize a system which was already well rooted in the conditions of rural life.

The form of tenure most characteristic of the history of the Dominican Republic was that of terrenos comuneros, a system operated through the acquisition by an individual of a government grant which entitled him to the usufruct of a quantity of land based upon the number of pesos paid (Clausner 1973: 121-124). These individuals could then sell part of the usufruct to others and these shares were called acciones or títulos de peso. Children inherited these shares on the death of their parents.

The exact location of boundaries for either the original

grant or subsequent subdivisions was never clearly spelled out. Part of the reason is that the government had no clear idea of the local geography. But a more fundamental reason was that the lack of exact boundaries was quite in tune with an agricultural system which placed little value on fixed fields. In slash and burn farming, clearings are made and utilized only for a few plantings, though these may be stretched out over a long period of years during which the land lies in fallow. New fields are constantly created and old ones are abandoned.

In practice, the use of the land was never limited by the number of acciones a person held, but rather by available manpower within an individual's own household and the location and prior claims of other farmers. Production and use were geared to the needs and capacities of a household subsistence (Rodríguez Demónzi ²¹ 1871: X: 199, 485). Further, as long as new forest was available, rights were given to newcomers as often as they were sold. Often newcomers were kinsmen or from the same locality as the first settlers; it has already been stated that a large majority of the settlers in Clear Creek, for example, came from the region of Jaravacoa. The newcomers were simply expected to act according to customary practices of respecting prior claims and entering into local reciprocities, including labor exchange in the form of cooperative labor parties (juntas).

In one sense these settlers may be thought of as squatters for while they enjoyed usufruct of the land, ownership was vested elsewhere, originally in the Crown and later in the national government. Mintz sees such a pattern as creating a fringe type

of Caribbean peasantry and Horowitz shows that the system of acciones also existed elsewhere in the West Indies (Mintz 1974: 147-148; Horowitz 1967). But as with squatter's rights in English law, formal title of ownership in fee simple could be granted after proof of a long and undisputed occupancy was furnished even if no previous title such as acciones was ever held. This occupancy has usually been thought of in terms of thirty years, as it is in Clear Creek today.

The customary system of land tenure in the settlement, with all of its flexibility and expansiveness, rests upon the assumption of abundant forest and new land. As such resources come into short supply, however, holdings and claims come to be more rigidly fixed and individuals try to define more clearly the limits of their occupancy. In Clear Creek, this process has been hastened not only by an increasing population but also by the intervention of the national government into the life of the settlement. Three main events must be cited to clarify this process.

The first event which entailed such intervention began with the establishment of lumber mills in Clear Creek which lasted from 1947 to 1954. The mills used labor hired outside the settlement and were under the control of Trujillo's brother, "Negro," who operated them from Bonao (Crassweller 1966). In order to utilize virgin forests for the maximum efficiency of the mills, acciones which were held by the local population were declared invalid. Though the land in the valleys which had long since been cleared of its original forest cover was left

alone, "Negro's" appointed official (el jefe de la loma) greatly restricted the customary practice of clearing forest for agricultural purposes. Thus, farmers found themselves more confined than they had been before.

The second event was the declaration in the mid-1950's of la zona in the settlement. La zona is a governmentally imposed regulation which changes the nature of slash and burn farming in areas like Clear Creek. Previous to this regulation, pigs, which formed a critical part of the local subsistence diet, were allowed to roam freely wherever they pleased. Clearings in the hills and house gardens in the valley had to be enclosed to prevent the pigs from rooting out the crops and much time went into the construction of wooden palisades around these fields. Because the pigs roamed at will, it was customary to regard only the enclosed fields as being truly a person's property.

The establishment of la zona, however, meant that animals, not fields, had to be enclosed. If pigs did damage to crops, the owner of the animals would have to pay damages. As the palisades came down, then, barbed wire which is singularly ineffective against pigs was put up in its place. But instead of merely fencing in the fields which were currently in use, barbed wire enclosed all of the bottomland that a household claimed as its own. Since barbed wire was costly, those who were able to acquire it enclosed as much as they could, even where this led to boundary disputes with neighbors. It seems also to be true that at this time much selling of the land took

place by those individuals who could not afford to enclose their land.

The third event was the death of Trujillo in 1961. Up until that time, "Negro" had continued the policy of restricting access to the hills around Clear Creek. No one was allowed to enclose land there, for he had claimed the land as his own domain even after the mills left. Within a week of the assassination, however, the enclosure of hills around the settlement had begun, principally that land which, having been cut over for lumber, had gone into pasture. Areas in secondary growth were also enclosed and some farmers were able to cover ten to twenty hectares in barbed wire. This again led to boundary disputes, and bitterness between certain households still stems from this period.

In Clear Creek today then the boundaries of holdings in the hills have become much more clearly defined; barbed wire has replaced the right to alter one's fields from year to year. As a result, large growers invest their profits in cattle which graze on large expanses of pasture. The continual burning over of the pastures for new grass prevents the eventual regeneration of the forest, preventing future use of the land for agricultural purposes. The expense of barbed wire limits the alternative of cattle production to large growers while keeping large amounts of land permanently out of agricultural use.

In the farther reaches of Deep Gorge the system of land tenure continues to resemble that of the terrenos comuneros. If forest in these areas has never been cleared, if it is not enclosed, and if no one has laid a previous claim, then any

individual may clear the woods to make a slash and burn clearing. But the national government still claims title to all of this land, whether enclosed by barbed wire or not, and officially all the settlers are regarded as squatters. The local residents are quite quick to acknowledge this. They claim to sell and inherit only the right to use the land (^{EL DERECHO/LA MEDIDA} la derecha) and the improvements they have made rather than actual ownership of the same. No one holds a clear title, though several persons have had their land measured in anticipation of applying for a title based upon occupancy. One neighbor of mine spent over \$250.00 in having his land measured and going through some preliminary stages, but he eventually gave up because he had so far dealt only with officials in La Vega and was nowhere near having his claim presented in the land tribunal which sits in the capital. While there is a general consensus that the government would not bother the settlers, there is scant belief that one could actually obtain a title and a little fear that an application might only pique the government's interest in this isolated valley.

The cumulative effect of these three events when combined with a constantly increasing population and the advantages of soil and water has been to concentrate the population of Clear Creek in the valley bottomland (llanos). The basic socio-economic unit in which this population lives is the household which has its physical manifestation in the house and yard complex. Changes in land tenure, namely the enclosure of lands previously open for the making of clearings and the

rooting of pigs, has been felt in the household by encouraging the clustering of households by related groups of kinsmen. This pattern of clustering is one of the main changes in socio-economic organization in the campo resulting from increased pressure on the land.

At the same time, the particular effects of agricultural development on the household can be seen in the composition of households as individual units. Here a direct link is shown to the mode of production for in the system of slash and burn farming, which was so geared to the flexibility of terrenos comuneros, the household supplied the needed energy requirement, aside from that of sun and fire, and labor exchange provided additional help when necessary. As long as land was abundant, the limiting factor in production was labor and a large household, as large as possible, assured the exploitation of a large and diverse area.

But in commercial farming only part of the labor force is recruited from the household, and in capitalist farming hired workers furnish the entire human energy input. Commercial farmers are, therefore, beginning to adjust the size of their households to fit the new requirements of the mode of production. For them, a large household is a liability for, while remaining the unit of consumption, it ceases to be the unit of production.

To ground this discussion more solidly in the ongoing life of the settlement, it is necessary to describe the households in which the population of Clear Creek, aside from the large

commercial farmers, live.

The symbolic center of rural life in the Dominican Republic, as elsewhere in the Caribbean (Mintz 1974) has traditionally been the house and yard, though the pulpería or small store has increasingly important social and economic functions. The house and yard is referred to as the bohío by Dominican farmers, the word coming from the Arawak name for dwelling. The bohío actually consists of two main buildings, the house and a separate kitchen, plus a well swept yard, several outlying sheds, an outhouse, and the house garden where subsistence crops are grown. Around this complex is usually a small coffee grove, growing under the shade of taller trees, and bananas and plantains which give the bohío an air of self sufficiency.

The house and kitchen are constructed of wood in most cases, either the thin slats of manacla (Euterpe globosa), cut from new clearings in the forests, or more substantial pine boards. The house contains two or three rooms, a sitting room which is rarely used, and one or two bedrooms. In the main bedroom is always a small altar with several worn pictures of saints and the Virgin and a few candles which are lit for a short time each night.

The kitchen walls are built with space between the slats to allow smoke from the cooking and evening fires to escape. The kitchen is the true center of household life and activity; here all visitors are received, though they might be detained a few minutes in the sitting room if they are total strangers.

A large storage chest is found in the kitchen, in which corn (mainly used for chicken feed), beans, and rice may be kept. The center of activity is the fogón, a large rectangular table with an earth filled surface on which the cooking is done in recessed adobe fireholds.

The bohío was once found in more isolated circumstances than it is today and this is related to increased pressure on the land. As long as new forest land was abundant, settlers and the sons of settlers built their houses at a distance from one another so as to utilize a large and varied area. As the land became more crowded, with the arrival of new households as well as the natural increase of population, this tendency to spread out was reduced. Concentration was further reduced by the events of the Trujillo era and the steady enclosure of land. Concentration in the valley was also abetted by the natural advantages of nearby streams and a soil which permitted the annual replanting of gardens which on the hillsides would have to be abandoned after a single harvest.

This concentration, however, takes the form of clusters which follow a typical Dominican spatial and social pattern for relatively dense rural populations. Clusters consist of three or four households of male siblings who have been given part of their father's property. These clusters fill out the natural environment of Clear Creek by occupying small niches in the contours of the valley floor, such as the wide bank at a curve of a stream or a rise of high ground. To understand exactly how these household groups have come into being, how-

ever, it is necessary to look at a crucial point in a resident's life cycle, namely that point at which he or she begins to live in free union.

Some 98% of the unions between men and women in the settlement are created without benefit of law or clergy. These are referred to in this study as free unions. Though 25% of these are eventually legalized by church or civil marriage, this occurs after a number of years of the couple's living together. The process by which a man and woman enter into free union follows the stages for a rite of passage as outlined by van Gennep (1960).

The first stage, separation, is accomplished by the couple slipping away at night from their respective households. This is done according to prior arrangement between the two, though the initiative is always presumed to be that of the male; it is said that he took her (Le llevó él a ella) rather than that they both went away. The ideal situation is one in which the male has already constructed a house on his father's property but at some distance from his parents' house. Permission to build the house is in essence permission to enter into such a union. Only 40% of the males, however, either have the resources or the permission to build a house and the rest must ask a relative or neighbor to give them protection and shelter. Again this is a way in which tacit permission is given to the union, for if a couple were unable to find someone to shelter them, they would abandon their plan.

The second stage, liminality, occurs after both sets of

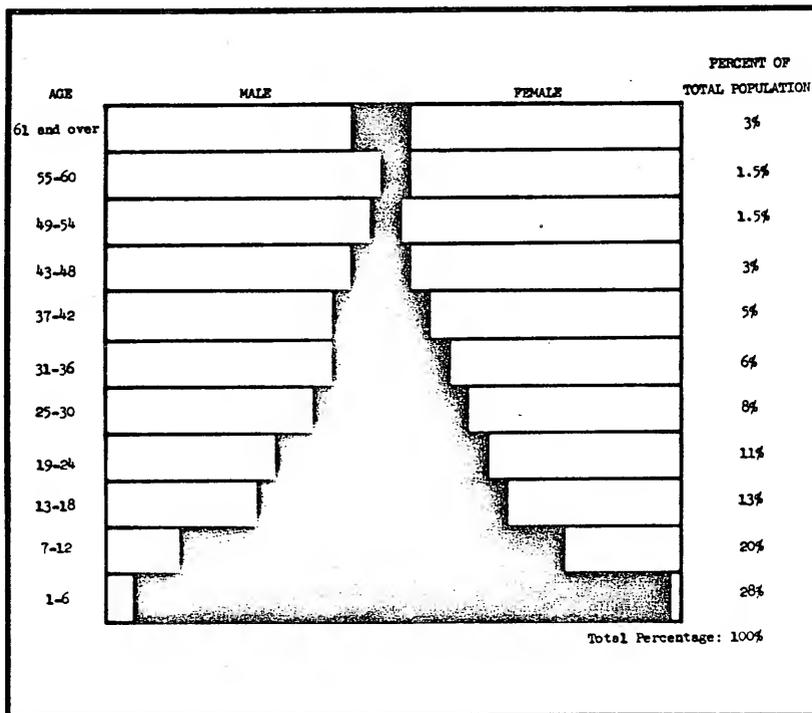
parents recognize that their children are gone and continues until the time that they are allowed to visit their households of orientation as a couple. Having consummated the relationship on the first night, the female has ceased to be a girl (muchacha) and has become a woman (mujer). Thus altered in word and deed, she cannot return to her house as before, especially if her parents continue to express their expected reaction of anger and shock. The pair confine themselves, then, to their new quarters, seeing few people, until they are allowed to visit their former homes.

The third stage, reincorporation, occurs as a gradual process of being recognized as a couple by the rest of the settlement. This hinges upon both the male and female making certain changes in their previous behavior. The male, for example, is expected to stop hanging around at the pulpería at night and to become serious (serio) by devoting himself to his work. The female, for her part, begins to cook meals entirely on her own and to confine herself to her new kitchen, attending to her few material possessions, and, as will be explained more fully later, sending cooked food to the home of her mate's parents and siblings.

The major element in the process of reincorporation, however, is the piece of land which the father gives to the son who has set up his household. In Clear Creek this is land in the valley, often land upon which the son has worked with the father, growing subsistence or, more recently, commercial crops. Thus the parcel which he receives is land over

TABLE 1

Age distribution of the population in Clear Creek.



which he has slowly been taking control.

But land in the hills claimed by the father is handled differently; it is never given as a gift, but is held intact, until it is divided on the parents' death. If this land is in pasture, any livestock which the new household possesses may be grazed along with that of the father. If, on the other hand, the land contains primary or secondary forest in which it is still possible to make clearings, the new household is free to claim a necessary portion for a slash and burn clearing. But since there is no need for fixed fields using this form of agriculture, there is no need to give the land in any formal sense.

Thus it is on the valley floor that clusters of households are created by male siblings living on land given them by their father. Women marry out of their own household of orientation and away from their father's holding. Defining virilocality here as being the establishment of a household on the male's parents' holding (uxorilocal) or an entirely new holding (neolocal), some 62% follow the virilocal pattern (Table 2).

Actual household size and composition reflect the needs of the mode of production and the necessity of achieving a balance between relative autonomy as a unit and interdependence in the cluster. There are two basic principles which guide the internal composition of households in Clear Creek and they may be stated succinctly as follows:

TABLE 2
Household residence patterns in Clear Creek*

Type	Neolocal**	Virilocal	Uxorilocal
Percent	24%	62%	14%

N = 126

* Follows the classification and definitions used by Pehrson (1954).

** These are generally households of the older generation of immigrants from Jaravacoa and elsewhere.

TABLE 3
Household composition in Clear Creek (generations)

Number of Generations	1	2	3
Percent	6.6%	67.2%	17.4%

N = 126

1. A full complement of biological and social roles should be present. There are a minimum of five: an adult male to carry out the work of agricultural production, an adult female to prepare food and maintain the household, an older son to help his father and an older daughter to help her mother and take care of younger children, plus a young boy/girl to run errands. Westbrook shows how the absence of such a balance is directly related to the economic viability of farm units elsewhere in the Republic (1970).

2. While five is the minimum, a maximum is established by the sentiment that a household can never contain more than one conjugal pair. Mintz points out that this is a common factor in Caribbean household structure (1974: 234). While households may contain more than one adult female, only under special circumstances do they contain more than one adult male. By adult male is meant a person who has or has had a mate and children.

These principles are acted upon in such a way as to produce a model household which contains one conjugal pair and two generations. Nearly 90% of the households contain only one conjugal pair and 76.2% contain the two generations (Tables 3, 4). As can be seen from looking at the composition table, households which lack children to meet their need for help in the kitchen and in the fields recruit by taking in children to be raised. Frequently, when the children of a couple have grown and moved out, they send one or two of their own children to live in the houses of the parents. What is masked in these figures is the large amount of casual lending and borrowing of children which occurs within the cluster as one household has need of help at a particular time.⁸ This will

⁸I found it impossible to run my household without having two or three children lent to me. Going to the store, weeding the garden, getting water, etc. were all tasks they performed in exchange for food, change, and other goodies. I had to have

be discussed shortly when we examine reciprocal relations within the cluster.

The need and desire for children to supply labor and future security is related as much by the average size of the household as by the rate of female fertility. The average household size is only 5.5 persons, the range being from one household of one person (a man whose wife was in New York and whose children lived with her mother further up the valley) to one of 15 (a man, a woman, and their 13 children).

While there were no comparative figures upon which to devise a birth rate for the population of Clear Creek, the rate of female fertility is extremely high ($N = 100$). The average female of childbearing age, that is 15 to 49 years of age, has 9.8 live births during her lifetime. Of these, 1.7 die before the age of two. For every 1000 women in the population of childbearing age, 280 give birth each year. This figure, which is much higher than that officially reported for the Dominican Republic, is partly the result of the basic demography of the campo which places many of the women in this category in the lower age bracket, i.e., below the age of 30, which is the period of greatest fertility (Table 1). It is also higher than the official figure because of the fact that many rural people do not report

more than one because children in Clear Creek, as elsewhere, in the world, are notorious for being absent when they are most needed. All this gave me much insight into the factors affecting a desirable family size.

their children's births, due to costs and inconvenience.⁹

A large number of children, preferably males, traditionally has ensured the prosperity of a household where the system of agricultural production was limited only by labor, not land. More laborers, that is, sons, meant that larger clearings could be made, more pigs could be attended, and more beans could be planted. These are all features of the slash and burn system discussed in the following chapter. What is important to note here, however, is that an increase in the number of children meant an increase in production although there was a gap between the birth of the first child and the appearance of the first helper in the field. Commercial agriculture, however, by changing the mode of production from sole reliance upon household labor encouraged limiting the size of households, a factor which shall be considered shortly.

As the population of Clear Creek has become increasingly dependent upon the valley bottom for its resources, such fecundity causes great pressure on the land, and each household seeks first its own benefit. In such a situation the cluster form of settlement has two very significant functions in limiting competition of available space in the valley.

The first function is that some of the offspring are discriminated against in the size of the parcel they may

⁹The national rate in 1970 was 184 live births per 1000 women in this category (Tupper, 1973).

TABLE 4

Household composition in Clear Creek: conjugal pairs.

<u>TYPE</u>	<u>PERCENT</u>
I. One Conjugal Pair	
a. 1 conjugal pair	4.9%
b. 1 conjugal pair + xo/da	68.0%
c. 1 conjugal pair + so/da de criaza	1.8%
d. 1 conjugal pair + so/da + dada/daso	2.4%
e. 1 conjugal pair + others	1.7%
f. 1 conjugal pair + so/da + humo	5.0%
g. 1 conjugal pair + so/da + wimo	.8%
h. 1 conjugal pair + so/da + others	<u>4.9%</u>
Total	89.5%
II. Two Conjugal Pairs	
a. hu + wi + da + dahu + daso/dada	1.7%
b. hu + wi + so/da + hubr + hubrwi	.8%
c. hu + wi + so/da + wibr + wibrwi	<u>.8%</u>
Total	2.3%
III. No Conjugal Pair	
a. mo + so/da	5.7%
b. mo + so/da + dada/daso	.8%
c. single males	<u>1.7%</u>
Total	8.2%

N = 126

potentially receive. The creation of minifundia in the Dominican Republic is encouraged by an inheritance system which states that all legitimate or recognized children, regardless of gender, inherit equal shares in their parents' property. Under this system of land transfer to married male children, however, female and unmarried male offspring do not receive an equal share. On the death of a parent, only that land which has not already been given away is divided among the heirs, including those who have already been given a parcel. This last division usually results in pieces of bottomland so small that they are sold to those sons who already have a share and who reside close by the parents' house.

A second function of the cluster is the pattern of reciprocities which exist between its various households which, as elsewhere in similar conditions, is enforced by the morality of kinship and residence (Bloch 1973; Firth 1951; Sahlins 1972). Through such reciprocities whatever diverse resources are contained within the cluster are shared. This may best be seen in the distribution of food which daily occurs between households.¹⁰

¹⁰One of my problems when I first came to live in this valley was that I was involved in a number of these exchanges. Each afternoon five lunches would arrive and I, of course, was expected to reciprocate. My protestations that I could not eat so much were in vain, though the steady appearance of children at my house made it obvious that my surfeit should be their gain as well. They were probably simply reclaiming what was their own to begin with.

The problem of reciprocity was partly solved when I discovered the local love of popcorn. Admired not only because it was a nutritious food but because so much could come from so little, I was able to return bowls of this for the food which

Such distribution, referred to as sending (mandar) food by the residents, is secondary to the distribution of food within the household. The sharing of food in the household involves a crucial division of labor. Men are responsible for bringing subsistence crops, manioc, sweet potato, bananas, and the like in from the gardens and the clearings. They also must lay in sufficient firewood and, in this, they are helped by their sons. Women, on the other hand, are in charge of store bought foods, children being sent to make the necessary purchases at the pulpería, picking spices from their herb gardens, and drying the coffee beans and preparing them for making that black and delicious brew. Helped by their daughters, they prepare and cook the day's meals. When the meal is cooked, especially la comida (the "real meal" or noon meal), the first plate is filled with food for the husband. The following plates, the number depending upon the number of households with whom exchanges are made, are filled and set aside to be sent. Then the woman fills her own plate and, afterwards, those of the children. A secondary stage of distribution within the household also occurs as the husband and wife give choice pieces of food from their own plates to the children, for example, a choice flake of meat, a bone, or some beans.

The exchange of food between households may best be

came my way. In time, however, by reciprocating more consistently with some than with others, I exchanged primarily with I-II, III, IV. On the days when I measured caloric intake, I did not give or receive food in any of these houses except for a cup of coffee in each and a small piece of roast pork which I bought. (It was delicious.)

examined in an actual situation. The neighborhood (vecinidad) in which my house was located, for example, was composed of a group of clusters which regularly interact with one another (Figure 6). There are three main clusters, (A), (B), and (C), which can be identified by the pattern of land tenure and food exchange. Each cluster includes (A) I-II + III + IV, (B) V + VI + VIIa + VIIb, and (C) VIII + IX (Figure 6).¹¹

This map is geared to the geneology chart for the same neighborhood (Figure 7). From comparing the two, it can be seen that households III and IV in cluster (A) are living on land given to them by their father in household II, while I is occupied by a daughter and her children who share the kitchen of household II. In cluster (B), the father in household VI has given land to his sons who occupy households V, VIIa, and VIIb. Household VI still contains two unmarried sons who help their father in his fields. In cluster (C) household IX occupies land given to him by his father; his widowed mother occupies household VIII with an unmarried man.

Each of the households exchanges food with others in its own cluster. On special occasions, during the Christmas season (las pascuas), for example, this network of exchange is enlarged further along the line of kinship. Using Figures 6 and 7, it can be noted that the wife in VIIb is the daughter of the woman in III and that the wife in VI is the daughter

¹¹Households VIIa and VIIb were occupying the same house temporarily because I was renting the house which had been occupied by household VIIb. Although they lived together, they tried to maintain separate household patterns: cooking, child-care and agricultural labor.

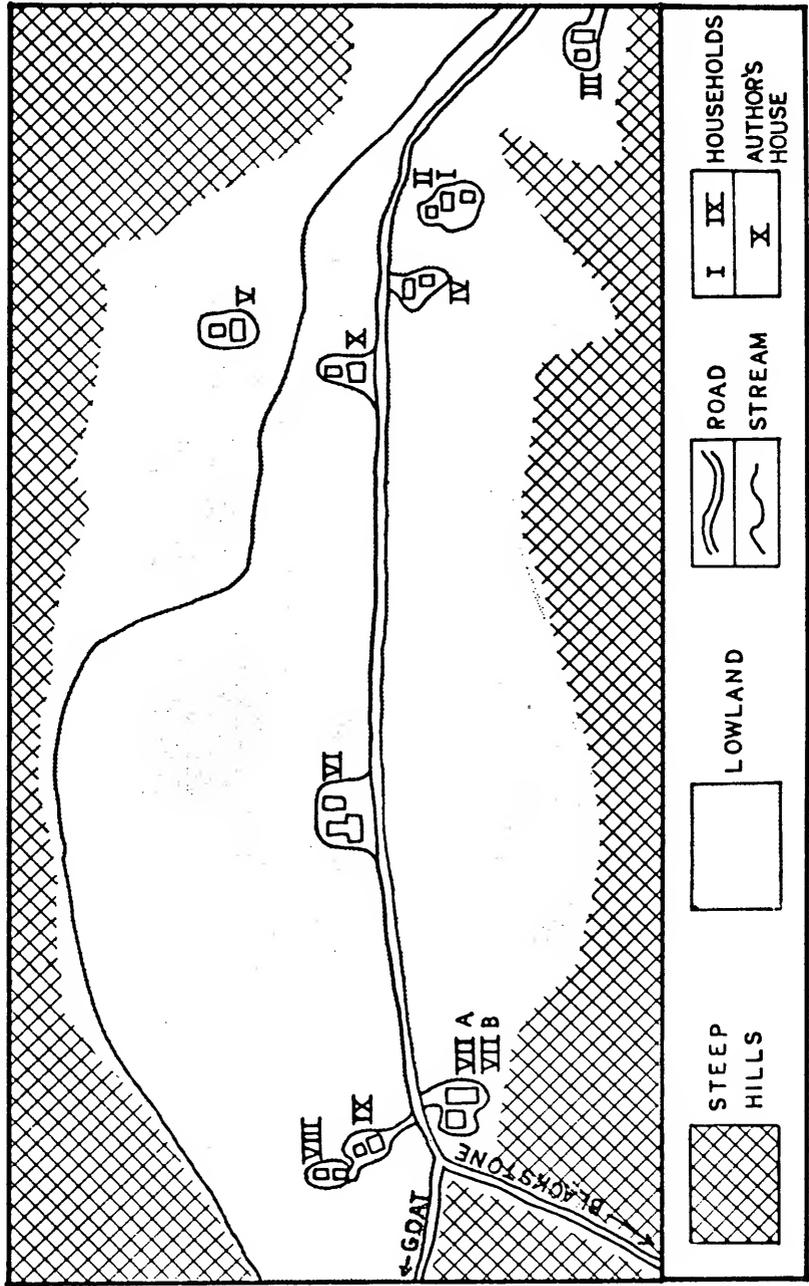


FIGURE 6

Map of a Clear Creek neighborhood (keyed to Figure 7)

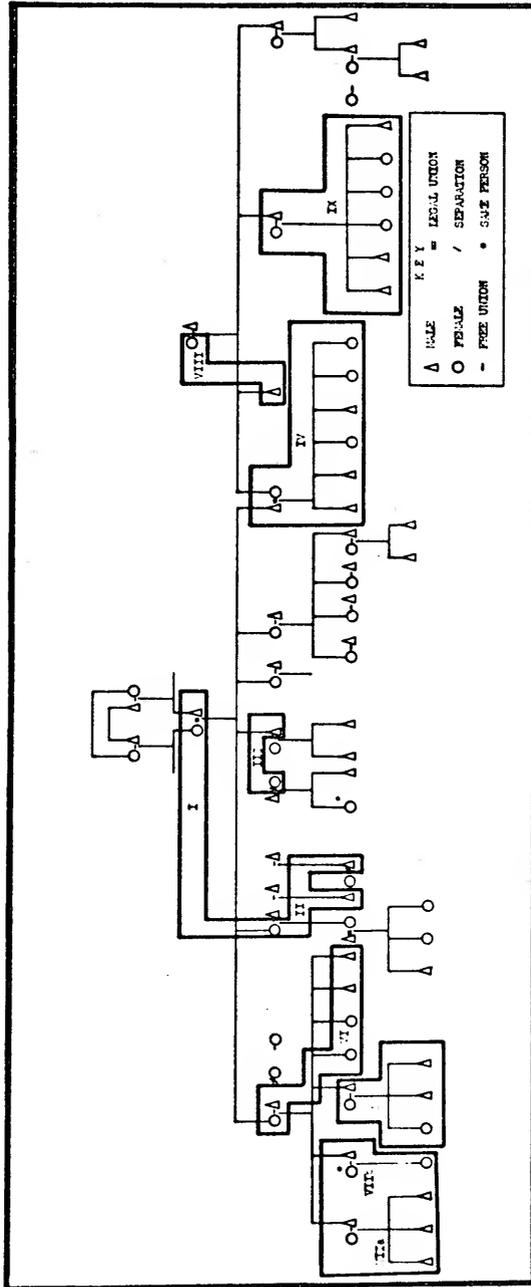


FIGURE 7
 Genealogy + household composition of a Clear Creek neighborhood (keyed to Figure 6).

of the couple in household I, and, thus, sister to the men in IV and III. Because of these relationships, these households exchange food on special days.

The purpose of such food exchange, especially when it occurs daily within the cluster, is to even out temporary or even more permanent imbalances in the diet of the households. Such imbalances do exist, either through the uneven distribution of resources or differences in household composition. The amount and type of food consumed by cluster (A) over a three day period in February of 1974 is described in Table 5. The food cooked in each household was weighed and measured, then converted into calories using the scales provided by INCAP for Central America.

The reason for the great disparity between the households was that the older son in II had roasted a pig to sell the meat and buy gifts for a woman with whom he had a visiting relationship. To go with the sudden abundance of meat in the household, for the son had to give some pork to his own kitchen and to the other households in the cluster, the women cooked up very large stews (sancocho). This was particularly true in II where his mother and grandmother had helped with preparing the pig.

Large bowls of food went out from II to III and IV and beyond to VI while very small bowls came in the other direction from III and IV and nothing from VI. This, in part, repays III for the milk sent daily when household III milks its cows. III has ten head of cattle while none of the other households in (A) have any.

TABLE 5
Food preparation in three households over three day period: Clear Creek*

Household	IV. 7.5 members	I-II 4.5 members	III 3 members
PRODUCT	weight (kg)	calories	weight (kg)
milk	.6	366	.7
yuca (Manihot dulcis)	1.5	1,980	15.2
banana (Musa sapientum)	1.8	1,980	1.1
rice** (Oryza sativa)	2.5	9,100	1.6
sugar** (Saccharum officinarium)	.9	738	1.4
meat: pork	1.8	4,860	3.0
sweet potato (Ipomaea batatas)	14.7	17,052	6.2
noodles**	--	--	--
yautia (Xanthosoma sp.)	.9	1,188	7.5
aceite** (peanut oil)	57 g.	530	127 g.
eggs	169g.	250	169g.
beans** (Phaseolus vulgaris)	.4	<u>1,348</u>	.9
TOTAL		39,392	58,297
DAILY PER CAPITA		1,750	4,318
			<u>1,685</u>
			22,038
			2,449

*household numbers are keyed to Figures 6 and 7

**store bought item

It is IV which suffers from chronic undernourishment. The head of this household is a lottery seller who does no agricultural work, though his two older sons do annually make a small clearing in the slash and burn fashion on nearby hills which are badly eroded. Of the nine members of the household, two of the children exhibited stunted growth and a third is mildly retarded, a condition his mother claims was caused by a lack of food when the child was very young.¹²

For this household, there is a second means by which food is distributed throughout the cluster, namely they eat in more than one household. Thus the children of IV invariably show up at II and III and hang around the fogón waiting for some boiled tubers or some rice and beans. They scrape the bowls and lick the pots. There is a good deal of bantering and not a little sarcasm directed at the children for this; their laxity in performing chores is pointed out. The point is that the children usually get the food along with the abuse. One of their tasks, after all, is to carry the food between households and whether or not all the food that leaves III gets to IV is open to argument.

Thus to an extent imbalance between households can be evened out and the unevenness of the reciprocity is tolerated, owing to the sentiments of kinship and residence, as well as the exchange of children's services (Bloch, 1973). However, morality is in limited supply and, as Firth and others imply,

¹² During that time, the head of this household practiced slash and burn farming in a distant part of the campo.

there is a constant tension between a household's own needs and demands on it to share. The extent to which one or the other is satisfied depends largely upon the relative scarcity or abundance of food (Sahlins 1972: 125-130).

Due to the inflow of cash from commercial farming into the settlement, however, some farmers have been able to purchase additional holdings besides the land which they have been given or have inherited. Desiring to break out of the cluster whose members no longer are able to reciprocate on the same scale, such farmers build new houses on their purchased holdings in a more substantial and comfortable style. It is an important symbol of economic progress for large farmers to leave their kinship clusters.

This move parallels the change in the mode of agricultural production. Large commercial farms like capitalist firms rely upon labor which is recruited through the payment of cash wages. This involves the differentiation of manager and worker functions; human labor is simply another source of energy which the manager thus acquires in somewhat the same way that he might purchase fossil fuels. The movement out of the cluster and its web of exchanges which, in slash and burn farming, involves the exchange of labor between households as needed, as well as the exchange of food, symbolizes the social as well as economic separation of the large commercial farmer from the household mode of production.

The new housetype itself symbolizes that process of differentiation. In the past decade, six of these new houses

which are patterned on the contemporary urban style have been built in Clear Creek. These are made from cement blocks and contain four or five rooms. On the outside they are coated with bright pastel shades of commercial paint in contrast to the wooden houses of the conventional bohío which receive only a periodic coat of whitewash. The kitchen is contained within the house because gas or charcoal, not firewood, supplies the heat for cooking. A porch in front of the house is used for visiting and, while the sitting room is still seldom used, it has important display functions for prestige furnishings such as the formica-topped tables and upholstered chairs, a phonograph and the inevitable plastic flowers, all symbolic of this household's ties to a new system of production and flow of energy.

There are, however, more profound changes in the internal structure of such households. The pattern of exchange between this household and others resembles more redistributive patterns than reciprocal ones. On a daily basis, food is not exchanged with other households, though this has its exceptions, but rather is prepared and given to the workers as part of their daily wage.

The redistributive feasts found close to the Haitian border, for example, which involve the preparation of meals for a hundred or more persons and the slaughtering of pigs and goats, is absent from Clear Creek. The religious framework in which such feasts occur, minus the spirit possession and drums of the voodoo ritual, is present. In Clear Creek

like settlements close to the frontier, there are velas (vigils) given in honor of the saints. But these ceremonies seldom involve more than the distribution of coffee and, perhaps, some bread or candy. Velas of this kind are, however, almost never given by large farmers, but rather by the more devout among the small farming population.

The large fiestas given by large farmers in the Christmas season symbolize their redistributive roles. The preparation of stews (sancochos), the provision of music, either by a small band playing the accordian, drum and gourd (guira) or by a phonograph and popular records, and the provision of some rum are all part of this fiesta. In addition, the people who come to such fiestas, the farmer's kinsmen, workers and friends, also bring liquor to share. If the farmer owns a store, the party guests usually purchase the liquor in his store. Thus some farmers actually appear to make money on their own apparently redistributive fiestas, a fact which no one seems to acknowledge in the lively atmosphere generated by the fiesta.

A different form of redistribution began to take place in September of 1974 when four of the largest farmers in Clear Creek, along with the schoolteacher, a migrant temporarily back from Brooklyn, New York, and a small farmer known for his piety, began to collect funds for the construction of a new church and school in the settlement. A new building had been demanded by the priest who visited the campo on the average of once a month and who was greatly annoyed at the deteriorating

structure in which he had to celebrate mass. He refused to return until a new building was under construction.

This small group of individuals, talking informally, agreed that the church and school should be combined which meant consolidating the two older wooden schools then located in the localities of Nuts and Pines. This move was naturally opposed by some of the residents of these localities who refused to contribute to the new construction. Nevertheless enough support was demonstrated and the building was begun in November of 1974.

The structure had cost some \$900 by February of 1975 and it was not yet completed. Some of the money was raised by a lottery backed by the largest farmer in the settlement and from small contributions which were collected in amounts of \$.50 to \$2.00. More than half the money came from the four farmers themselves aside from \$250 raised elsewhere by the local anthropologist. In addition, these farmers supplied the transportation of the necessary materials and housed the only paid worker, a professional carpenter from Black Stone. Labor was provided by some of the large farmers and by their close kinsmen, and also by residents who often work for these farmers who "donated" their labor. In addition a number of small farmers worked from time to time.

This type of structured redistribution, supposedly done for the benefit of all the children of the settlement, demonstrates an important way in which commercial farming further

changes attitudes toward land and the household, since formal education prepares students for non-agricultural occupations. The formal educational system teaches no agronomic skills nor is any part of the curriculum directly applicable to the experience of rural students. The condition of one's hands is an important symbol of one's social and economic standing in the Dominican Republic and the school presents a model of behavior in which a person handles chalk and pencils rather than hoes and machetes.

Education becomes a means whereby children are drawn off the land, leaving a holding more intact than if the sons needed room for their own households. A commercial farmer's anger at his son's elopement must be seen not so much as due to the loss of the son's labor, but as due to the necessary division of his holding. For the large farmer, the effects are even more debilitating for he does not rely so heavily upon his sons for labor as smaller growers, yet the son is entitled to a share by local custom.

The educational process itself encourages migration from the settlement. If students continue past the third grade (in the new school there are now five grades), they must leave to study in River or Jaravacoa. The universities are, of course, in the capital, Santo Domingo, and Santiago. Though no one from Clear Creek has ever attended these, some boys from River have and interestingly enough, this occurred only after that family moved to Santo Domingo.

Urban employment requiring formal education would reduce the division of land for, as has been seen, the division is

based upon the establishment of a household on the property which is given. Any form of urban employment, of course, would reduce fragmentation and this is an important factor in migration out of the settlement. The location of the school in the middle of commercial farming areas is symbolic of the connection between commercial farming and education. When the older schools were functioning in Nuts and Pines, some children from households which practiced slash and burn farming were able to attend classes due to proximity. But the new school is located more deeply in the heart of the valley bottomland, farther from those households which practice the old adaptive strategy. Whereas some children from Deep Gorge once attended classes, none attend the new school.

Another influence of the new adaptive strategy of commercial farming is the decision by commercial farmers to limit the size of their families, in order to minimize the subdivision of their land. The practice of birth control in the settlement is a new phenomenon. The first two women who had tubal ligations, which is the form of control utilized, were the wives of the two largest commercial farmers. Since then 12 women have had the operation but not all of these are married to commercial farmers; they include two wives of lottery salesmen and one woman who runs a small store. No women from households which practice slash and burn farming have had tubal ligations.

Slash and burn farmers are simply not able to accumulate the amount of cash (\$80) required for the operation at a clinic

in Bonao. It is interesting to note that five of the women who have had the operation are all married into the same group of male siblings which includes the two largest farmers who together control more than six hectares of bottomland. This relationship indicates that the decision to have the operation is probably influenced by information flow among personal networks and perhaps by the force of peer-pressure and trend-setting among the more influential families.

It is important to point out that the operation is undergone principally with an expressed concern for the health of the woman rather than for the size of the family. The idea of not having as many children as possible is still regarded by the people in the settlement with some askance and the position that having more children would be detrimental to the woman's health carries more weight. The women who have had the operation state that as a secondary reason it is important to have fewer children so they can be provided for and educated better. But this is strictly a secondary factor and, indeed, since the average number of live births for these women is 8.0, only a little under the 9.8 average for all childbearing women, this would seem to be the case.

The important factor, however, is that commercial farmers and those engaged in the cash economy more than in subsistence activities recognize that a large household can be an economic liability. This change is not an easy one to make and the idea of birth control is controversial in the settlement, not for

religious reasons but for reasons of health, for some claim that the operation is dangerous to a woman's health. The priests do not disapprove and, even if they did, it would not necessarily carry much weight for they disapprove of many local practices.

Summary

This chapter has considered the social and economic organization in Clear Creek in terms of two crucial factors, the system of land tenure and the organization of the household. These factors are demonstrated to be intimately related, since the household has been the traditional mode of production and its formation marks a critical point in the devolution of land from one generation to another. The formation of household clusters in the llanos represents a change from the more dispersed settlement pattern which earlier characterized Clear Creek. These clusters have resulted from the growing concentration of the population on the most valuable and productive land. At the same time, the enclosure of land on nearby hills and its conversion into pasture has pushed the major areas for swidden farming further away from the settlement and, thus, made the use of slash and burn techniques an increasingly less attractive strategy.

The population is undergoing further transformation as the settlement becomes divided between large and small holders of land. Large farmers have been shown to move out of the cluster form of settlement in which exchange reciprocities figure so

prominently. Large growers also limit the pressure on their own holdings by attempting to educate their children to move away from the land and by limiting the size of their family. Their productive capacity, therefore, is no longer contingent upon the size of their household, but rather on their ability to accumulate resources for carrying out commercial production.

It is still necessary to examine in more detail the actual working of the two adaptive strategies in the settlement: slash and burn farming and irrigated crop production. Chapters three and four look at these as technological systems and discuss how the transition came to be made from one to another, a transition whose effects we have already seen in the pattern of land use and of the household.

CHAPTER THREE

SLASH AND BURN AGRICULTURE

The socio-economic changes discussed in the previous chapter have resulted primarily from a shift in the adaptive strategy of the Clear Creek settlement from a reliance by the vast majority of residents upon slash and burn farming to a growing economic dependence of the settlement upon commercial crop production. This chapter on slash and burn farming and the following one on commercial agriculture further juxtapose these two strategies, elaborating on many of their contrasting elements which have already been touched upon in terms of land use, energy use, and the mode of production (Figure 1). Greater detail in defining the social and technological bases of these strategies is necessary not only for its ethnographic value but also as a way of emphasizing the radical differences between them, as well as some profound parallels. Once these contrasts have been drawn, the constraints which operate to give socio-economic change in Clear Creek its most important direction, namely the gradual placing of the settlement's resources into the hands of a few large growers and outsiders, can be better assessed.

Three key aspects related to slash and burn agriculture are discussed in this chapter.¹³ The first is the distinctiveness

¹³Slash and burn farming can be defined as a variant of swidden agriculture, a system in which clearings are used for short cropping periods which alternate with lengthy fallow

of households which practice slash and burn farming in Clear Creek; the second is the productive process itself, the third is an evaluation of the use and flow of energy. Before these are explored, however, a word should be said about the history of slash and burn agriculture in the Dominican Republic and in Clear Creek.¹⁴

Swidden farming in the Dominican Republic developed its present form from the combination of indigenous techniques and crops with the Old World crops and domestic stock. At the time of the arrival of Columbus, the Indian population of Hispaniola had developed a highly sophisticated system of farming which utilized permanent fields, mounding, and even irrigation in

periods. The agricultural system in Clear Creek is clearly a case of swidden agriculture if one uses the ranking system developed by Goosten, which derived an "R" index for determination of the degree of intensity of land use (Ruthenberg 1971: 3, 16). The symbol R stands for the number of years of cultivation multiplied by 100 and divided by the length of the cycle of land utilization (Ruthenberg 1971: 3, 16). Since the fallow period in Clear Creek's hills has traditionally been ten years with a two year cropping time, then:

$$\underline{R} = \frac{2 \times 100}{12} = 17$$

This is clearly a case of swidden agriculture as anything smaller than an R of 30 falls into this category.

¹⁴As far as I know this is the first time that this system has been described in one of the contemporary Caribbean nations, though Blaut (1959) has discussed aspects of it in Jamaica. Swidden agriculture is mentioned far back in the Dominican historical record (Hoetink 1971: 19-20, Loven 1935, Rodriguez Demorizi, 1891: X, 197, Saint-Mery 1796: 49, Schoenrich 1918: 149). In addition, numerous case studies have been done elsewhere, including those in Africa (Allan 1965, McNetting 1968, Richards, 1951), Asia (Conklin 1957, Freeman, 1955, Newton 1960, Rappaport 1971), and the Americas (Caniero 1961, Carter 1969, Harris 1971, Reina 1967).

combination with swidden techniques utilized on the hillsides where principally maize was grown (Loven 1935). This bears a striking resemblance to the balance between intensive and extensive techniques used in Clear Creek today.

The population of the Spanish colony took over and added to the Indian food complex, calling cultigens which were propagated by stems or cuttings viveres, because they formed the bulk of the diet and thereby sustained life. But they abandoned the intensive techniques for with the native population exterminated, pressure on the land was less than before Columbus. Lacking the development of a plantation system, the colony had a great expanse of empty land to be filled. The household was the social unit which expanded into the new territory and the Indian swidden techniques gave a maximum result for a minimum of effort (see Sahlins 1972: 41-148).

Swidden farming was combined with the hunting of hogs and some cattle which ran wild in the forest. The cycle of planting and fallowing in the forest clearing was repeated usually three times and then, with the soil depleted, the land was converted into pasture. The large hatos, or cattle ranches which existed in the 19th century, were simply large areas which had been abandoned by swidden farmers. The original forest did not grow back because the land was periodically burnt over to allow new grass to come up. Cattle, then as now, were the most highly valued form of livestock. During the 18th century swidden and ranching were practiced in the Valley of Constanza itself, though the region was subsequently abandoned

and repopulated only in the latter part of the last century (Saint-Mery 1796: 236, Hazard 1873: 314). One can speculate that the reason for this discontinuity was the exhaustion of the landscape, but the literature makes no mention of the matter.

It was the mixing of swidden agriculture with livestock which literally brought people to Clear Creek in the early part of this century. Farmers from Jaravacoa, hunting wild pigs, stumbled upon the valley and, as the land seemed good, one or two returned later in the year and made clearings, planting beans and viveres. Those who returned did so in groups of kinsmen, always a father with his unmarried sons. Working together, they fenced in the fields and built small, temporary shelters (ranchos) where they stayed a few days at a time. These male contingents from Jaravacoa, alternating their residence between Clear Creek and the natal settlement, were joined by the rest of their household in Clear Creek during the bean harvest when extra help was needed.

Since the harvests were good, water abundant, and land plentiful (with or without acciones), the ranchos were made more substantial. The first household settled permanently in the valley in 1913 on a site close to where the new church-school now stands. Eventually two brothers of the head of this household arrived with their wives and children, building houses at opposite ends of the valley while other settlers, non-relatives, also began to take up residence in Clear Creek.

Two impressions are always mentioned by older settlers in connection with those early days: the abundant harvests and the isolation of the households from each other. The situation was not unlike that of Deep Gorge today where many houses are located at least one hour's journey from the nearest neighbors.

The houses of these early settlers were built with upright poles lashed together with vines since nails were too expensive. Beds were made with hide stretched across frames, and mattresses were stuffed with bean husks; the roofs were thatched with stiff grasses. This bohío, consisting of the house, the kitchen, the garden, and several sheds, was enclosed by a stout palisade, constructed in the same manner as the walls of buildings. This palisade cut off the household as a clearly defined group while serving as a practical defense against roaming wild livestock.

This house type reflected the basic assumption about land use which has been discussed above: that crops and buildings should be fenced while animals roamed free. But, as mentioned previously, increasing pressure on the land affected some of these basic assumptions about land use. Restrictions were placed upon access to virgin forest--la zona ended the free foraging of livestock and encouraged the enclosure of hillside land. The repeated burning of enclosed pasture prevents regeneration of forest and the eventual reuse of the hills for agricultural purposes.

Thus in the areas of Clear Creek where swidden agriculture can be practiced, there appears to be a paring down of

the fallow period. Whereas earlier the elapsed time for transition of forest to unimproved pasture was about 36 years, the time for three cropping periods (two years each) with three fallow periods (ten years each), farmers now appear to be limiting the fallow period to as little as six or seven years. ✓

In spite of these factors, up until this past decade virtually all the households in Clear Creek depended upon swidden agriculture for the main part of their calories and a little cash, the cash coming from the sale of beans which is the crop sown first in new clearings. Beans command a high price and, due to volume, weight, and storage qualities, they are relatively easy to market. Crops such as sweet potato and the other viveres, however, are characterized by bulkiness, perishability, and high water content which, when coupled with their low price, make their transport to urban markets from Clear Creek unprofitable.

In the last decade, however, the number of households engaged in swidden agriculture has dropped significantly. With a new road into the settlement, it suddenly became profitable for outside entrepreneurs, with capital to invest, good credit and knowledge of certain technology allowing for greater production, to come into Clear Creek and initiate commercial farming. The cash-producing power of this adaptive strategy coupled with the ideology of its more "modern" way of life attracted a number of swidden farmers away from their old production techniques, at a time when laws against cutting virgin forest were being more strictly enforced and

the frontier of new forest was becoming inconveniently distant from the settlement.

In 1974, only 35% of the households in Clear Creek made one or more clearings on the hills of the sección or adjacent territories. Though the household is no longer so clearly bounded as a distinct socio-economic unit as when the palisades were used, the households of swidden farmers still have certain characteristics which set them off from the average Clear Creek household. These features are household size, land-
holding pattern, and location. ✓

Average household size among those which practice swidden farming is larger (7.4 persons/household) than the settlement average (5.5 persons/household) (Table). This gives credence to the statement that relatively large households are encouraged by swidden farmers since the limiting factor in production has traditionally been labor, not land or capital. Thus, offspring who, under other circumstances, might leave to form a household of their own or migrate out of the settlement, are encouraged to remain longer by the fact that their labor is vitally important to their household of orientation.

The second difference noted in the chart is that swidden households have far less than the average amount of bottomland (llanos). It is interesting to note that the amount of land annually cleared in the hills (whether in secondary or primary forest) usually compensates for this imbalance. Comparing per capita holdings in llanos, households practicing swidden agriculture have .06 hectare opposed to the settlement average

TABLE 6

Comparison of landholding of slash and burn farming households and total population in Clear Creek.

	Number of Households	% of Total	Number of Persons Per Household	Mean Land Holding in Bottomland (<u>llanos</u>)	Per Capita Holding in Bottomland (<u>llanos</u>)
Total Population	128	100%	5.5	.88 hectare	.15 hectare
Slash and Burn Farming Households	43	35%	7.4	.42 hectare	.06 hectare
<hr/>					
	Mean Annual Clearing in the Hills (<u>loma</u>)		Per Capita Clearing in the Hills (<u>loma</u>)		
Total Population	.29 hectare		.05 hectare		
Slash and Burn Farming Households	.86 hectare		.12 hectare		

of .15, but in the hills (loma) they have .12 hectares as opposed to the average of .05 (Table 6).

This difference in holdings of llanos, however, is partly a function of the location of households practicing slash and burn farming for these are found quite naturally on the margins of the settlement, in the higher reaches of Goat, Pines, and Nuts where the valleys are narrow and meager. Thus, these houses are closer to the remaining forest since the distance to one's fields is an important consideration in the practice of swidden; travel is a major energy cost in the production process. However, they are further from the main road through the settlement which is its main link commercially to the outside, a fact which increases marketing costs for their limited cash crops.

Although swidden agriculture in Clear Creek provided the original rationale for the settlement, it has become a less frequent adaptive strategy in recent years. Households which continue to practice it tend to have more members, occupy less of the commercially valuable land, and occupy a distinct environmental niche. But the manner in which swidden agriculture actually forms an adaptive strategy can best be seen from examining the core of that strategy, namely the process of production.

The production process will be presented as a series of distinct stages which, in this case, are the categories used by farmers in Clear Creek which, from interviews elsewhere in the country, apparently hold true for any area of the country

where the strategy is practiced.

Site Selection

A number of factors enter into the decision as to where to place a new conuco, a planted clearing, not the last of which is the government's contention that swidden is illegal.¹⁵ Therefore, the location should be hidden from view of the occasional outside forestry agent who might report and fine the farmer or, more commonly, demand a bribe. Though two residents of Clear Creek are forestry agents, they do not report swidden activities, entering into a conspiracy of silence toward the outside.

A second factor is that the field should be close enough to the bohío that the heavy, cumbersome food crops can be brought back without undue difficulty. Beyond a distance of about 1.5 hours, it is necessary to erect substantial shelters where the household lives during peak labor periods. At smaller distances, the workers can return daily to their permanent home.

A third factor is the necessity of making sure no prior claims exist on the land. If it is in secondary growth (botado), a farmer must make sure that the original farmer

¹⁵The first law against swidden agriculture was passed in 1876 but left without enforcement. Trujillo forbade the cutting of pine or other valuable woods without a permit as well as the felling of trees within the vicinity of running streams. The latest law, passed in the 1960's forbids the cutting of any tree within the entire country without written permission. The arbitrary enforcement of this law gives rise to great abuse; residents interpret it as meaning the government neither allows nor wants them to work (trabajar), since swidden has traditionally been the measure of a man's ability to do labor.

does not want to reuse it. A farmer may sell his right ^{EL DERECHO} (la derecha), that is, the improvements he made by first clearing the land, but more often he simply makes it known he has no further designs on the property. Conflict over claims may lead to the intervention of local authorities which is usually avoided by residents.¹⁶

A fourth factor which swidden farmers consider is placing conucos, planted clearings, in the same general area but each occupying a particular slope or niche. This allows the selection of a variety of microenvironmental conditions and the staggering of the production cycle so that a farmer, coming home from working one field, can stop off in an older clearing to dig up some sweet potatoes and at still an older one to get some plantains.

In this same line, a farmer must consider the environmental factors: the slope, soils, and vegetation of a hillside which give him a series of clues about a location's potential productivity. The hillsides in and around Clear Creek slope precipitously so farmers try to find gentler gradients which would create the drafts necessary for a good burn but not let a newly planted crop wash away in a heavy rain. Loss of top-

¹⁶ An example of this occurred during my stay in Clear Creek. A man from Clear Creek had gone to make a conuco near the home of his wife's parents in Deep Gorge. An uncle of the wife, however, had had his eye on a piece of land that the younger man began to clear. The men argued over the land, but the younger refused to look for a plot elsewhere. Bypassing the alcalde who wanted to settle the dispute by discussion, the uncle went to River where he reported his rival to the police. A few days later, they came and, joined by the alcalde, they found, beat, and arrested the niece's husband. He was taken to Constanza, fined \$25, and thereafter he left the settlement

soil during heavy rainstorms is also minimized on gentler slopes.

The classification of soils and vegetation show that even if these farmers are not enraptured with their work, they have built up a working body of knowledge about their environment. Soils, for example, are examined by sight and touch and they yield six basic categories: color, cohesion, moisture content, structure, exposure, and slope (Figure 8). Some categories have a number of divisions. Color, for example, has six major shades. Some categories such as exposure only have two main divisions, right (derecha) where the sun's rays hit first during the day (west slopes) and left (izquierda) where they hit later in the day (east slopes). In addition to the main division in slope between hill (loma) and bottomland (llanos) there are four minor subdivisions between types of slopes in the hills: ridge (cumbre), steep slope (hayda parada), regular slope (hayda), and hole (hoya).

These soil qualities are, of course, dynamically inter-related, each factor influencing the other to create a total gestalt. In the Dominican folk taxonomy, combinations of soil characteristics are reduced to two main polarities: good and bad, cold and hot (Figure 8). Good and bad refer to soil productivity, the actual yield a farmer may expect. Temperature refers to drainage and exposure to sunlight; cold refers to a poorly drained, shaded plot and hot refers to well

entirely, going with his wife to live on the edge of Bonao, and began to look for day labor.

drained, exposed locations. When swidden farmers describe the ideal soil for a conuco, they talk about the valley bottomland: deep, black soil with a medium loose structure and some stones (to retain the heat), well exposed and well drained, but, in addition, having some cold spots for certain crops. Any clearing in the hills, then, represents a compromise with this ideal and reinforces the need to have a number of clearings so that the deficiencies in one conuco can be matched by the benefits of another.

Besides soil conditions, the swidden farmer examines vegetation; in this, he strongly prefers virgin stands. He believes that even though the layer of humus associated with virgin forest is thin, it will nourish his crops and the burning of the vegetation will produce a good, thick ash. He looks for certain trees, such as the manacla (Euterpe globosa), and grasses, such as segua (Maranta arundinacea) which signify good land, especially for growing beans.

Despite this strong preference, only about one-fifth of the clearings made in 1974 were in virgin forest because land which is botado, that is, in secondary growth, is often closer at hand, and quicker to clear and prepare. On such land, the farmer looks for trees such as colorado (Cyrilla racemiflora) and chicharron (Guazuma ulmifolia) which signify productive soils. He knows that palo prieto (Erythrina glauca) and palo santo (Dendropanax arboreus) are produced on thin and poor soil. There is a time element involved here, however, for palo prieto and palo santo are those trees which come

earlier in the regrowth cycle, after four or five years, whereas a good growth of colorado indicates that the land has rested about ten years and is ready for recropping. Of course, an added advantage is that cutting regrowth is not considered illegal, a distinction made quite clear in the last election.¹⁷ Once the site is selected, the actual job of clearing begins.

Clearing (talar)

This stage involves cutting down the underbrush with a long knife known as the colín, a name derived from the Collins firm of Hartford, Connecticut, who first brought this type of machete to the Dominican Republic. If he is working in virgin forest, the farmer will first clear a part around his future conuco, letting others who may come along later know that this spot is already claimed.

In clearing the land and in the next two stages, the farmer does not work alone since this is defined as difficult

¹⁷The local Reformista (governmental party) candidate for síndico in Constanza brought the forestry chief to a political rally in Clear Creek during which the latter, in reply to demands from the farmers, said they were still forbidden to cut virgin forest, but secondary growth could be cleared. He was met with a great deal of heckling. The forestry subchief, a man noted for his corruption, said during the meeting that since the law had been passed, no one had ever filed for permission to cut a tree anywhere in the sección. This implied that officially no swidden agriculture was occurring here or elsewhere in his district.

Like any economic activity, the whole question of cutting forest is a highly political one in the Dominican Republic. In another settlement near Haiti, two brothers had sought permission unofficially for many years to cut and burn about 12 hectares of virgin forest. Shortly before the last election, a local candidate told them that for their support he would see that they got off without a jail sentence if he got their vote.

and frequently dangerous work. A farmer relies for help upon older males in his own household, but when the conuco is large, a cooperative work party (junta) may be organized by the farmer.

The persons called to the junta are the farmer's siblings and neighbors. When households were more scattered than today, the junta had important social functions in bringing together persons who rarely saw one another. Members participate with the understanding that their labor will be reciprocated by the others when it is needed.

With the growing compactness of the settlement as well as the introduction of commercial farming, the junta is used much less now in Clear Creek. It continues to be used in household clusters on the margins of the settlement where swidden farmers principally live. Because siblings are now neighbors, the labor exchange has simply become one more aspect of the reciprocities within the cluster, quite unlike the situation among commercial farmers where labor exchange has ceased. Juntas are, however, created informally in new clearings where a number of conucos may be made in close proximity to one another.

Felling (tumar)

Felling the largest trees with an ax and smaller ones with a colín is the next stage. This is a dangerous task be-

Hiring laborers, including Haitians, a large part of the land was prepared. Their candidate was elected and a few days later the huge field was burnt. While work in the forest could be hidden, the smoke could not. Arrested and taken to court, the brothers were each fined \$9.00 and released. They returned to plant as much of the land as possible in beans. The entire crop was washed away in a heavy rain a week later.

cause an inexperienced or careless worker can cause a tree to fall in the wrong direction. Stories of persons with limbs or lives lost in such mishaps are common, but undoubtedly more common than the actual occurrence.

Chopping Up (picar)

This stage involves the breaking up of the larger trunks and branches to permit a more rapid drying and an even burn.

Waiting (aguantar)

After this period of intense work, there begins a period of waiting for a succession of dry weeks which will leave the felled wood ready for burning. This necessitates usually six or more weeks so that fields, prepared in January or February, are burned in March or April if the weather permits. Conucos, however, are made twice a year, with a smaller field planted in August or September. This second field must be readied in June or July, after the beans are harvested from the first field.

Burning (quemar)

Burning both clears the field and fertilizes the soil, though much depends upon how well the brush and timber burn. If the wood burns evenly, a rich layer of ash will be deposited over the field and a second burning will not be required. The effect of burning upon tropical soils is a complex one but a number of studies agree that it produces a slight increase in pH, in nitrogen, and in carbon with increases also in magnesium, potassium, phosphorus, and

calcium (Nye 1964, Popenoe 1959, Watters 1960, Zinke 1970). These immediate reactions are not, however, consistent through the profile and there appears to be a decrease in the amount of these elements after the harvest but before secondary growth begins building the soil back through the deposition of leaves and the decay of roots.

The problem in Clear Creek, as elsewhere in areas where slash and burn is practiced, is that the period of regrowth is not sufficient to allow the full rejuvenation of the soil. This factor, coupled with the erosion of the soil due to heavy rains, makes a second and third conuco on the same site less and less fruitful. When the land is given over to pasture, then, it is still periodically cut back and burned to allow young grasses to grow. Thus even small trees are unable to reestablish themselves and reclaim the land for forest.

Reclearing (avistar)

If the burn has been uneven due to wind, dampness, or the slope of the land, the reclearing takes considerable time. The farmer must drag the unburned residue into large piles and fire it, posing the risk that meanwhile a rain will wash away the ash from the first burning before he has a chance to plant in it.

Planting and Harvesting (sembrar y cosechar)

Planting, like the selection of a site, requires the farmer to consider a large number of factors. The first concern is to ensure a successful bean crop since this

forms the major part of the farmer's cash income. The right amounts and combinations of cultigens, rice, and corn must be selected to give large and continual yields. As with site selection, the emphasis is upon diversity and variety. Each of these concerns is examined in more detail below.

Cultigens, that is, the viveres, are not planted from seed, and the cuttings necessary for propagation are sought from a wide network of kinsmen and neighbors. Manioc stems and sweet potato vines, like banana and plantain cuttings, are readily obtained from others, but farmers may also use cuttings from older fields or his own house garden. A swidden farmer will often travel some distance to get cuttings if he hears that someone has a particularly good variety of one of the viveres, such as sweet potato or yam. The farmers freely share cuttings of the viveres with one another, and in this way constant experimentation occurs and crops are tried out in new microenvironments.

Among swidden farmers, crops that are easily transported and stored, beans, dryland rice, and maize, are not so easily shared. Maize and rice are usually stored from one harvest to the next planting, but if a farmer runs short, he may borrow from another grower only if he agrees to return the seed at the end of the season at the rate of 10 to 1 per measure, usually the cajón (10 to 12 pounds). Only a small portion of the bean harvest is kept, however, at the end of the season and this is usually for consumption. The reason is that the price of beans at harvest (May-June, October-

November) is usually higher than it is at the time of planting, owing to the timing of harvests in the Constanza region which is different from that elsewhere in the nation. While beans have always been marketed out of the settlement, a higher proportion seems to have been retained in the earlier decades.

The first concern for the swidden farmer is to ensure a successful bean crop, this being the major part of his annual income. Beans are the first crop planted; when the plants show two leaves, viveres and the other crops are interspersed among them. The multicropping of viveres is viewed with jaudiced eye by the person unacquainted with tropical farming systems for he sees in the plot only jungle and chaos. In addition, there is great individual variation in plant combinations. Yet a major element in the Dominican swidden is that each farmer approaches his work with his own genius or foolishness. This individuality is indicative of the latitude with which swidden farmers interpret and manipulate their traditions. The advantages of such latitude are stressed by Johnson who quotes Campbell in making an analogy to biological evolution:

Heterozygosity, in particular the presence of recessives, represents a latent potentiality for rapid responses to a shift in environmental selection. In a similar way, dissident opinion, unexpressed with majority opinion is successful, represents a latent potentiality for change if group failure is encountered (1972: 150).

While the seeming randomness of the conuco plantings opens the possibility to new combinations being discovered, the selection of crops takes place within the framework of a

Crop	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Beans (<u>Phaseolus vulgaris</u>)				X												
Squash (<u>Cucurbita maxima</u>)					X											
Rabano (<u>Arracacha xanthorrhiza</u>)						X	X	X	X							
Rice (<u>Oryza sativa</u>)						X										
Maize (<u>Zea mays</u>)						X										
Sweet potato (<u>Ipomoea batatas</u>)						X	X	X	X							
Pigeonpeas (<u>Cajanus indicus</u>)									X	X	X					
Yuca (<u>Manihot utilisima</u>)										X	X	X	X	X	X	X
Yautia (<u>Xanthosoma sagittifolium</u>)										X	X	X				
Plantains (<u>Musa paradisiaca</u>)											X	X	X	X	X	X
Banana (<u>Musa sapientum</u>)											X	X	X	X	X	X

FIGURE 9

List of crops and times of maturation in a typical conuco.

few basic principles. A list of crops commonly planted on conucos is presented in Figure 9.

Farmers express their understanding of the different soil requirements of various crops in terms of the familiar folk dichotomy of hot and cold. They realize that crops must be planted in soil conditions which favor their development. For example, a plot which stretches on both sides of a narrow valley may have bananas planted on the warmer, northwest face and plantains with yautía on the colder southeast side. Likewise yuca and sweet potatoes are planted in the upper reaches of a plot where the soil is better drained while yautía is planted where it responds to greater moisture and higher acidity in the lower parts. Thus the farmers describe the crops as favoring a certain type (hot/cold) soil. For example, yuca is said to like "hot" soil while plantains and yautía are said to like "cold" soil.

Some of the crops have inherent qualities of hot and cold apart from the soils they favor. While the majority of crops are believed to be neutral in their effect on one another, certain combinations are harmful. Rice, for example, is believed to be so hot that it will hurt rábano while chick peas because of their coolness must be kept on the borders of the conuco. Other mixtures are safe but spacing is crucial. Care is taken so the leaves and vines of sweet potatoes do not cover other crops planted with them.

In addition planting combinations aim at developing as total a leaf cover as possible. Crops are chosen which

develop at different heights, a technique which makes the swidden resemble the structure of the forest it has replaced (Geertz 1966). Thus, in a mature swidden, squash and sweet potatoes grow on the ground level under medium height yuca or rábano which, in turn, may be slightly shaded by leaves of the banana and plantain.

Besides diversity in size and height, a conuco should have crops maturing at different times to produce a continual source of food to the farmer and his dependents (Figure 9). After beans and maize are harvested, squash is the next crop produced. Sweet potato follows and forms a major part of the local diet. At approximately the same time, dryland rice and rábano are harvested. After a year, yuca, both sweet and bitter varieties, should be harvested along with yautía, though, if the season is a poor one, they can be harvested early. The great advantage of root and tuber crops is, of course, that they can be left in the ground until they are needed, although pests are still a major problem. Bananas and plantains will produce for a number of years, depending upon how well they compete with weeds which invade the field after other crops have been harvested.

Combined with the farmer's use of a number of conucos during the year, the system obviously aims at diversity. The vicissitudes of weather and the onslaught of rats, crows, and disease would make any monoculture, an unstable vegetative system, extremely susceptible to upset. This can be clearly seen in an examination of just one crop, beans, of

which farmers keep very clear mental records because it is their main source of cash.

Over a six year period, two households in Pines cleared a total of 29 conucos whose first crop was always beans. The average yield was four and a half cajones for every cajón seeded, giving an average harvest of some 147 kg. per hectare. This figure, however, is the result of wide variation in yields; seven harvests represented losses to the farmer, that is, they got back less than they planted (or nothing at all) while five returned more than 380 kg. per hectare. The farmers explained this variation on the basis of weather conditions and poor soil. Conucos likewise exhibited great variation in size from 3.6 to .2 hectare with a mean of 1.1 and a mode of .8 hectare. Bean loss, however, did not represent the whole spectrum of crops planted and the conucos were able to provide for the household's subsistence in spite of the relative instability of one crop, albeit the most important in terms of commercial transactions.

Planting and harvesting beans is a labor intensive operation and, because this work is not defined as either difficult or dangerous, women in the farmer's household work in the fields. When distance does not necessitate the removal of the entire household from the house and yard, older males leave for the conuco in the morning while the females attend to the kitchen, the house, and the small domestic animals. The main meal is prepared and brought up to the men in the early afternoon. From that time until the later

afternoon, the entire household works in the conuco except for smaller children who are either attended by older female offspring or play in the fields, mimicking the adult activities. In the evening, the whole group returns; the men carry sacks of viveres from older clearings for the next few meals while looking for firewood along the path.

As can be seen from the above description, the women of the household contribute to the direct work of production and, through their preparation of the produce, to the creation of the closed loop energy cycle of the household. That cycle is open to the outside only through the sale of beans and, occasionally, some wood or charcoal. Income from these activities allows for the purchase of tools, food staples such as cooking oil, salt, tobacco, and, ironically, beans as well as clothing. Labor is contributed by the household, with labor exchange providing a mechanism for the recruiting of additional male help.

In terms of its use and sources of energy, then, swidden agriculture in Clear Creek represents a relatively simple system (Figure 10).

The flow of energy in this adaptive strategy is relatively closed by being a self-contained system, relying upon the outside for a crucial but small portion of its energy needs. The tools of the swidden farmer, usually bought with bean money, are few and simple, a colín, an ax, a machete, though this last has not entirely replaced the coa, a wooden digging stick still employed to plant rice and corn. An exceptionally high

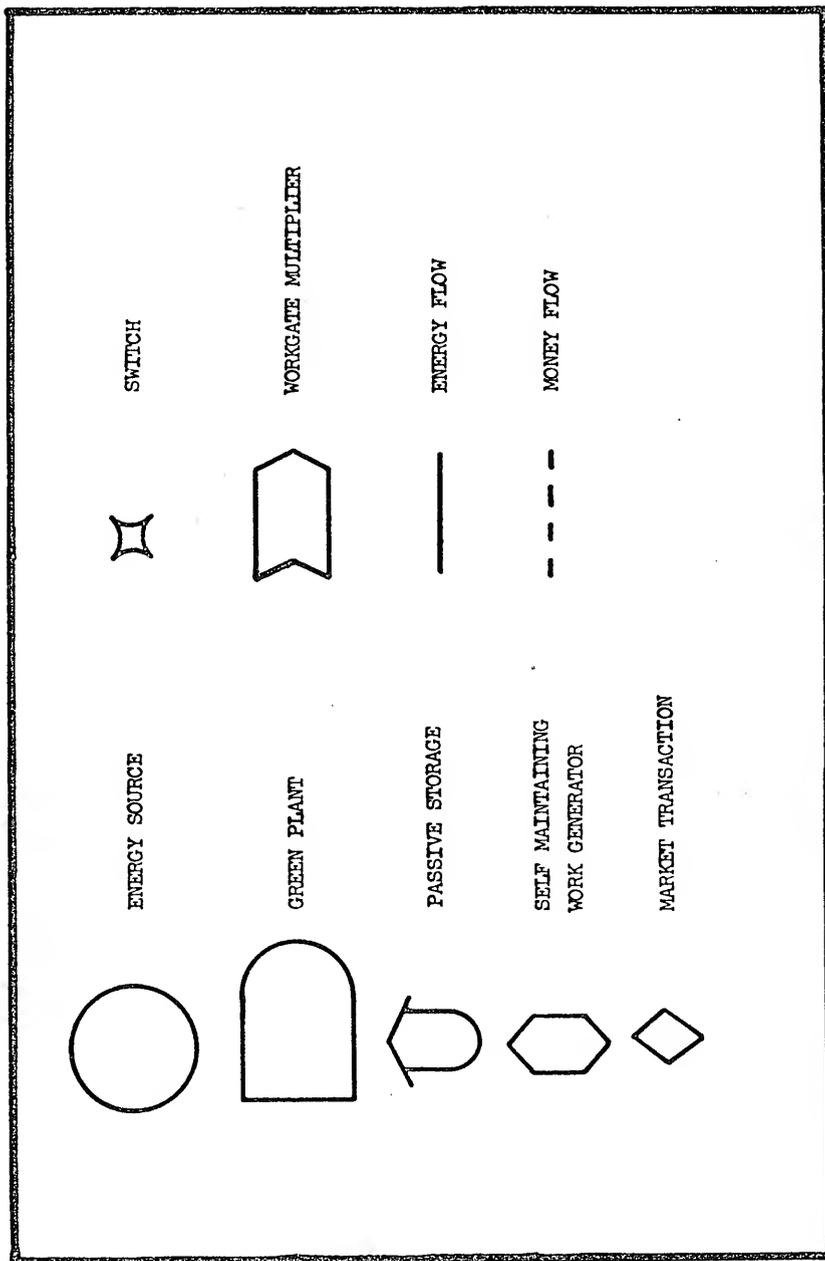


FIGURE 11

Symbol key for energy flow diagram (adopted from Odum 1971).

TABLE 7

Energy budget for slash and burn agriculture.

Work hours per hectare (two year period)

<u>Activity</u>	<u>Hours Required</u>
Find and claim field	57
Clear underbrush	126
Cut trees	99
Break up brush and trees	120
Burn	15
Clear and burn over	69
Plant beans	74
Plant other crops	164
Harvest beans	138
Weed	281
Build "rancho" in the field	49
Harvest other crops	581
Travel to and from field	<u>1492</u>
Total	3270

Human energy inputs per hectare (two year period)

<u>Input</u>	<u>Amount</u>	<u>Kilocalories</u>
Labor	3,270 hrs.	611,489
Tools	6 kg.	<u>27,612</u>
Total		639,101

Energy returns per hectare (two year period)

<u>Output</u>	<u>Amount (kg)</u>	<u>Kilocalories</u>
Beans	413	609,500
Manioc	2,774	3,661,680
Sweet potatoes	1,557	1,806,120
Yautia	1,763	2,327,160
Rabano	1,696	1,696,000
Bananas	2,906	2,058,100
Plantains	1,005	1,296,450
Rice	120	436,800
		<u>17,605,730</u>
Minus 30% loss due to disease and pests		<u>6,162,005</u>
		11,443,725
RATIO OF ENERGY INPUT TO OUTPUT		1:18 kilocalories

yield of beans (Table 7) would have brought a per hectare income of roughly \$317 in 1973, based on prices which were the highest ever received in the settlement for this particular crop. The average return to a swidden farmer per year, however, is just over \$120 for his bean crop.

The efficiency of swidden farming as an adaptive strategy in Clear Creek can be computed by figuring the costs and returns of the system in caloric terms (Table 7). The figures expressed in the caloric tables are a composite of interviews with ten swidden farmers and my observations and measurements on the conucos of two of these with whom I worked over a yearly cycle. The figures assume that the conuco is located 1.5 hours from the household, that the plot is made in virgin forest, and that it produces for a two year period. The conversion tables for the tools, as well as for the agrochemicals in the following chapter, are derived principally from Pimentel (1974). The energy expenditure was figured at 220 per hour of hard labor and 180 per hour of lighter work. The results, however, should be approached with some caution and used primarily as a means of contrast with commercial farming.

The rate of return in this system to human inputs is relatively high, 1:18, that is, for every one calorie of energy expended in the productive process, 18 are returned to the worker. Almost all of this return comes from the growing of a diverse and varied complex of viveres. The figure is particularly high when it is compared with the 1:4 ratio for commercial agriculture discussed in the following

chapter.

It must be born in mind, however, that these ratios are based only upon human inputs, made either directly through household labor or by an industrial system. Essential inputs supplied by rainfall and solar radiation are excluded and their addition would significantly alter the ratio of return. For example, assuming a cover of green plants, some 1,700,000,000 kcal. of solar energy per day per hectare are converted into organic matter (Odum 1971: 50). The ten year regeneration period necessary in swidden farming to make a second clearing, thus, requires some 6,205,000,000 kcal. per hectare. In sharp contrast, a second three month crop grown after the first annual harvest in commercial farming requires only the solar energy needed to grow the crop itself, some 539,140 kcal. Thus the ecological costs of swidden farming, apart from the human inputs, are much higher than those of commercial farming.

The swidden system is costly in another sense, namely in the deterioration of the local environment. The loss of virgin forest is creating not only socio-economic problems for swidden farmers but is also creating the danger of permanent damage. In January, 1974, I visited some of the remaining woods in a hidden gorge which was located in a nearly inaccessible part of Clear Creek. I found that approximately seven hectares had been leveled by men from only five of the 43 households engaged in swidden agriculture that year. Clearings of such an extent have an effect upon the runoff and silting in the dam at Tavera in whose watershed Clear Creek is

located (Antonini, et al. 1975, Gonzales 1972). More important for the settlement are the effects upon the local environment. Commercial farmers lay much of the blame for the disastrous floods of August and September 1974 on the fact that the hills surrounding the valley no longer restrain heavy runoff due to the loss of forest cover.

The efficiency of slash and burn farming, therefore, must be judged on the basis of its short and long term effects.

Summary

Slash and burn farming in Clear Creek is a distinct adaptive strategy whose mode of production, the household, has particular characteristics, whose process of production is relatively efficient in the short run, and whose flow of energy is simple and relatively closed. Its extensive use of the landscape, however, is being deterred by the enforcement of national laws and the enclosure of land for cattle production. However, in Clear Creek, the recent development of commercial farming as a viable alternative strategy has been the most important factor influencing farmers to change production methods. This has resulted in a decrease in the number and percentage of households engaged in swidden farming over the past decade.

The rationale for swidden farming in Clear Creek stresses the importance of diversity and individuality in the choice of sites and crops. This factor gives the system its resiliency in regions like the hills of Clear Creek whose resources do

not lend themselves to other kinds of agriculture. Slash and burn farming, at any rate, provides an historical and technological framework against which the characteristics of commercial farming may be more clearly evaluated.

CHAPTER FOUR
COMMERCIAL AGRICULTURE

The present chapter develops a discussion of commercial agriculture in Clear Creek in order to contrast its mode of production, its productive process and its energy flow with that of swidden agriculture. The findings shown in this chapter indicate that all three of these aspects respond to the necessity of acquiring outside energy inputs, especially fossil fuels and products of industrial origin produced for agriculture, e.g., agrochemicals, steel plows, and trucks for transporting farm produce to urban centers. Dependence upon such inputs serves to create an imbalance between large growers who are able to reinforce their economic position by establishing favorable connections with outsiders controlling credit and marketing channels and small growers who are not.¹⁸

Acquiring necessary inputs with cash has affected the mode of production in the settlement where now wage labor has come to partially or fully supplant household labor in the production of commercial crops. Three distinctive sets of labor relations have been developed which correspond to the size of the producer's holdings. Large farmers hire all the

¹⁸It should be remembered that large growers are referred to as those with over two hectares of llanos. While intermediate is a term used in describing one of the modes of production, a small farmer generally means anyone with less than two hectares of llanos.

labor necessary for the productive process. Those with intermediate sized holdings utilize substantial labor from their own household, although a regularly hired man, described as being "of the house," is usually retained. The smallest farmers rely primarily upon household labor but occasionally utilize hired help.

The economic advantages which accrue to large growers can be clearly seen in the discussion of the productive process of commercial farming. The study shows that large farmers are able to obtain credit, agrochemicals, information, and marketing contacts which the small farmer can neither establish nor maintain. To compensate for this disadvantage, the small farmer must approach the bigger growers to act as intermediaries for him in marketing and obtaining credit. The influence of the large growers in the settlement is greatly increased by the dependence of small growers on them. As a result, for example, the large growers could decide on their own, disregarding the desires of other residents, to have a new school built.

From the analysis of the flow of energy in commercial farming, the study shows the commercial system demonstrates a less efficient use of human energy inputs than does swidden farming. The long term comparative advantage of commercial farming is only apparent when inputs from the environment and the long term ecological results of each strategy are considered. The short-term competitive advantage of the commercial strategy is its ability to produce cash which allows the

farmer access to a greater range of foods and consumer goods than in the swidden strategy. This enables him to live in a style more "modern" and "advanced" than that of his fellows.

The benefits of commercial farming are most clearly displayed in the manner in which large growers take advantage of the work of swidden farmers. It has been stated that a result of slash and burn farming is the conversion of forest into pasture. Pasture is used for the grazing of cattle which belong mainly to holders of large parcels of llanos; cash generated from intensive agriculture buys cattle which serve the large growers as a form of investment (Table 8).

The buying of cattle is concomitant with the enclosure of land for pasture. The purchase of hillside tracts from individuals who have prior rights, either by clearing or by reference to earlier títulos de peso, has led to the concentration of hillside in the hands of large growers which mirrors their consolidation of land in the valley bottom. The forest or secondary growth is of little value to the large grower who will give the right of making conucos to swidden farmers provided that the land is left to revert into pasture. Swidden farmers are willing to do this because these tracts are closer to the settlement than forest elsewhere which may be without any prior claims but which is at a greater distance. As a result, commercial farming gains the advantage of allowing the farmer to benefit from the swidden activities of others by converting surpluses into cattle as well as apparently improving the farmer's level of living and having the long term advantage

of relatively greater efficiency when compared with swidden farming. These benefits come into clearer relief when examined in the light of the mode of production, the productive process and the energy flow of commercial agriculture.

Before proceeding to look at these three key aspects of commercial farming as an adaptive strategy, the history of the introduction of commercial agriculture into Clear Creek must first be reviewed to explain the rapidity with which the change from swidden to commercial agriculture has occurred.

Irrigated vegetable production was introduced to this general region through the establishment of an agricultural colony for foreigners in the Valley of Constanza (Walker 1972). In 1956-1957, colonists with agricultural backgrounds were brought by Trujillo principally from Spain and Japan to settle there and at other sites in the Dominican Republic (Anjelli 1962). These settlements were designed to introduce modern agricultural techniques to the Dominican population.

Previous to this time, the valley of Constanza had been used for pasture and small holdings of viveres by settlers who had been arriving since the late 19th century. Holdings of these Dominican farmers were confiscated by Trujillo in the 1950's and their titles of terrenos comuneros were voided. Trujillo then built irrigation canals and roads and gave each foreign colonist land, a house, and a weekly income. The colonists, in the beginning, grew a range of vegetables for the urban market in Santo Domingo, but later, increasingly came to concentrate on onion and garlic production when a few

TABLE 8

Relation between size of holding in llanos and cattle ownership.

Size of holding in hectares	Number of holdings	Average number of cattle	% of total number of cattle
0.0 - 0.5	73	0.2	4.1%
0.6 - 1.0	26	2.0	12.3%
1.1 - 2.0	18	11.2	52.3% *
2.1 +	12	10.5	31.3%
	130**		100.0%

* Half of these cattle are owned by one household which has just under 2.0 hectares.

** Includes four holdings held by outsiders.

growers consolidated their holdings as others left the colony. The land of the colony is now concentrated in the hands of a few Spanish and Dominican growers who employ large numbers of daylaborers or peones. These workers live in squalid conditions in the town of Constanza itself; those times when there is work, they must walk to the fields in the morning, returning in the late afternoon. Most of these daylaborers have migrated to town from outlying parts of the municipio.

Although this dramatic change in the Constanza Valley was known in Clear Creek, it was not feasible to emulate the new pattern there, since there was no good road connecting Clear Creek with the main highway which ran between Constanza and Bonao, a necessity for marketing commercial produce. A road, which had been built in the 1940's to aid in removing lumber produced by the now defunct sawmills, had fallen into disuse. In 1967, however, as a result of Balaguer's election, a road was constructed into Clear Creek. The principal motivation for the building of the road was to give patronage to a Constanza engineer who was a prime supporter of a local candidate who ran on the presidential ticket. The engineer received the contract to build the road and apparently made a large profit from it. Thus, while the road was greatly desired by the entire settlement, which had voted solidly for the president, it was not built as a direct response to their needs.

The next year, a number of outsiders, arriving separately, came into the settlement to grow crops on enclosed bottomland

which was being used as pasture. These outsiders rented land and began to cultivate it with the techniques of intensive agriculture which were in use in Constanza: the application of fertilizers and pesticides, the hiring of daylaborers, irrigation by small pump, and the use of motor transport for marketing produce.

These outsiders included an American, a Spaniard, and a former resident of Clear Creek who lived in Jaravacoa where he had learned intensive paddy rice farming from a colony of Japanese nearby. The American rented two hectares of land to grow flowers, selling his product in Santo Domingo and abroad.¹⁹ The Spaniard grew several good crops of garlic and the Dominican from Jaravacoa grew a paddy rice crop which failed due to the cold temperatures but followed it with a crop of tomatoes which was greatly successful. Except for the rice, all these growers seem to have made substantial profits. By 1969, these men had left the settlement, each for what appear to be personal reasons.

At the same time these men came to Clear Creek, several residents who had had previous experience outside the valley with irrigated farming returned to live in Clear Creek. One

¹⁹When I went to live in Clear Creek, it was expected that I, like the American who had since left, was there to learn about farming so that I could then buy land and make money on agriculture. This seemed to create little anxiety and, in fact, the main concern of several individuals was that when I was ready to buy land, I would buy it from them at a "good" (i.e., high) price because, after all, we were friends. It was only when I did try to grow several crops on land which had been given to me for a season by a neighbor and had almost total failure that they were certain this was not my purpose in the campo.

of them, building on his experience working with middlemen, had bought a small truck for transporting produce. Not surprisingly, it was these men and their closest neighbors who were the first of the local residents to begin to do commercial farming in the settlement. The first crops which they grew included beans which were also grown in Contanza using modern methods. Using irrigation, improved seeds, fertilizers, and pesticides, they grew beans and produced yields at least six times as large as those produced by swidden farming. The following year other crops were introduced: tomatoes, garlic, onion, cabbage, and peppers, vegetables seldom grown by Dominican farmers. The system of farming spread to other persons who held bottomland and by 1971-1972, commercial farming in the llanos was well established in the settlement. By 1974, 45% of the farmers in the llanos were practicing this form of farming.

An important element to note here is that those persons who were initially successful in commercial farming and who went on to become large growers were persons with contacts already established with commercial farmers outside the settlement. They were able to parlay their initial success into the continual accretion of land holdings. For example, the manager of the flower farm in Goat which is the most heavily capitalized holding in the settlement worked with the American grower before the latter left for Puerto Rico in 1969.

The rapidity with which this change in adaptive strategy occurred is explained by a number of factors which made commer-

cial farming a viable alternative to swidden agriculture. Most important was the fact that vegetable production offered a cash return on the small parcels of llanos which the majority of households in Clear Creek held. It has been shown how men received land as a culmination of the process by which households were formed. This land, until then, had been used intensively only in terms of house gardening.

While cash was necessary to obtain the required inputs for such farming, credit was available through Constanza suppliers. In addition, information about commercial farming had been circulating since 1956-1957. Now, the system was given practical demonstration in Clear Creek's own llanos by outsiders. With the road linking them to the main highway, residents of Clear Creek were able to consider commercial farming as a viable alternative strategy within their own settlement. Furthermore, it was soon discovered that irrigation systems could be built cheaply and easily by the construction of flumes which could bring water from small side streams in the hills onto the llanos. Where possible, simple ditches diverted the water. Thus, the settlement had no need for governmental assistance to build large-scale systems like that in the valley of Constanza. Because there was plenty of water available, Clear Creek did not need a centralized authority to control water use.

But, by giving up swidden farming, the commercial farmer did not have to give up the production of subsistence crops. The coexistence of the house garden with the new vegetable

field made the transformation truly viable for smaller, less capitalized operations, since these farmers therefore would not have to depend entirely upon cash income to obtain food.

Almost all households in Clear Creek, a full 89%, maintain such gardens, where yuca, sweet potatoes, bananas and other crops in the swidden complex, except beans, are grown. Because the gardens are located on the good soil of the llanos, receiving only a short annual fallow period, and being rotated, in some instances, with pastures every four or five years, they continuously provide households with a high proportion of daily caloric intake, although as farm size increases, this percentage decreases due to greater reliance on store bought foods. In the households of large farmers, however, the gardens are pushed out of sight. These farmers claim that bananas and plantains make the house too dark and cold when planted closely, although kitchen refuse traditionally has served as an inexpensive, organic fertilizer for these crops.

The reliance of commercial farmers on purchased food is further increased by the fact that keeping chickens, ducks and turkeys is not compatible with the new adaptive strategy. The pesticides which are sprayed on growing vegetables kill insects upon which such animals feed, and by eating poisoned insects, the animals are, in turn, poisoned. This is especially true on small holdings where commercial fields run right up to the kitchen around which these animals usually cluster. The loss of these animals, an important source of protein, was always cited to me by commercial farmers as a strong disadvan-

tage to their farming system and by noncommercial farmers as a reason for not engaging in modern agriculture.

To summarize at this point, we have seen that commercial farming was introduced to Clear Creek by outsiders after a road was built connecting the settlement with the main highway. Knowledge of vegetable production was already present in the settlement but outsiders had to demonstrate the practicality of these methods in Clear Creek. Residents who had greater contact with this system outside of the settlement were the first to practice the techniques, but the use of modern methods spread so rapidly that by 1974, some 45% of holdings in the valley were devoted to vegetables during at least part of the year.

The explanation for the rapidity of the change in adaptive strategy lies principally in the ability of commercial farming to offer a cash income to farmers who practice it. Other factors, however, were essential preconditions to the successful introduction of commercial farming: the availability of credit, the low cost of irrigation, and the ability of farmers to maintain subsistence crop production. These factors made the new strategy viable at a time when the advantages of the old were steadily diminishing.

Mode of Production

From looking at the history and the process of change in adaptive strategies, the stage is set for comparing some of the structural differences between swidden and commercial

farming systems in terms of the mode of production, i.e., the organization of labor. This will be followed by discussions of the productive process and the use and flow of energy.

Unlike swidden agriculture where the mode of production takes the form of the household, commercial farming presents a continuum of types of labor organization in Clear Creek. While the distinctions are not always clear cut, one extreme of the continuum is represented by the small commercial farmer who draws labor from his own household and hires additional labor from neighboring households only on occasion while the other extreme is represented by the corporation which grows flowers in Goat totally using hired labor, both managerial and manual. In between these extremes are farmers who use household labor and hire neighbors, but who also hire, on a more or less permanent basis, a daylaborer (peón) who is referred to as being of the house (de la casa). This intermediary stage represents an attempt to have a labor relationship which at once invokes the sanctions of kinship but which also involves the separation of peón and farmer.

These three types of labor relations are roughly correlated with the size of the holding and the intensity of its use in commercial farming. Below .5 hectare, the farmer gets most labor from his own household, supplementing it by hiring neighbors. As a holding approaches one hectare, the farmer feels the need to take on more permanent workers. This need may be, in fact, more "felt" than real for the peón often does work which the farmer himself could do but chooses not to.

The hiring of such a worker, therefore, symbolizes a change in the status of the farmer. Farmers with more than one hectare and especially those with over two, attempt to hire workers who are treated as clients by the farmer who becomes their patron, but who are treated more impersonally than peones de la casa.

A shortage of labor, per se, is not a problem for the farmer who only has a very small holding. For example, a farmer with .5 hectare works a little more than 100 eight hour days per year, assuming that he grows two principal crops, tomatoes and beans, during the twelve month period (Table). The problem is, of course, that intense labor demand occurs at certain peaks, at planting and at harvest, and it is during those periods that he must obtain outside labor.

In most cases, these peak demands can be met by the unmarried males in the household, as one might expect from the discussion of the swidden mode of production. But in looking for additional help, the farmer does not call a junta nor, with the exception of the bean harvest, will he ask the females in his household for help. Rather he will hire unmarried males from neighboring households who, as we have seen from the discussion of the cluster settlement pattern, are usually his nephews. Within the settlement, such a worker would not be referred to as a peón, he would merely be working for an occasional day (echando el día). Because of his kinship tie to the farmer, it would also be said that he was merely helping (ayudando) his relative rather than directly

working for him. These distinctions are necessary because the status of a peón is decidedly below that of a farmer. Thus the relative who is working for the day is protected from any major loss of status, and he can claim that his labor is a form of reciprocity rather than a strict market exchange of cash for labor. But the disadvantage of a relative's being a daylaborer is that, if the crop goes badly, the farmer may, in fact, decide that the help has come out of a spirit of family solidarity and, thus, not feel obliged to pay him.

Further, this work is sporadic, occurring only at peak labor periods. This may suit an unmarried male, but if a man must support a household with neither the land nor credit to do commercial farming, nor the inclination to practice slash and burn techniques, he must seek a more satisfactory and regular position. This coincides with the needs of a farmer who has a large enough holding to hire a worker for at least several days a week.

The relationships of the daylaborers who are considered "of the house" to the farmers are an interesting combination of employee-employer roles with client-patron ties. On holdings where there are one or two regular peones de la casa, the worker, on the one hand, is expected to work on this farm whenever he is needed, and the farmer, on the other hand, is expected to hire this worker before any others. The worker is often advanced money, putting him in the debt of the farmer. He is expected not to work for others unless another potential employer gets permission from the farmer to borrow the worker

for a specified period of time. Thus, while these workers are paid a bit more than the average pay of \$1.25 per day plus a noon meal, they are not free agents.

For his part, the farmer may frequently give a job to the worker which he could as easily do himself. This frees the farmer for other types of activities, including visiting or tending to cock fighting. The willingness of Dominican farmers to pay for work which could be done by themselves has sometimes been described as symbolizing a distain for manual labor, which interferes with the efficient operation of the farm units. From the farmer's point of view, however, such an interpretation is false for he is merely "giving work" to individuals who are in need of it; commercial farmers with a medium sized holding who do not "give" work to the poor (los infelices) are roundly criticized by the residents of Clear Creek.²⁰

The large scale capitalist farmer, with over two hectares, tries to separate himself from daylaborers and their personal concerns just as he builds his new house to separate himself from his siblings. This is to avoid demands upon his resources which he considers unjustified. At the same time the large farmer must act sufficiently in the role of patron to assure himself a steady labor force. An example of the kind of con-

²⁰ By the same token, small parcels of land are often "given" by farmers to neighbors with less land to enable them to grow viveres or a small crop, with the understanding that the land revert to the farmer at the end of the growing season. Thus I was given a small plot to grow vegetables by a neighbor because he saw my own garden not doing well because the ground was too "cold."

flict which a large farmer fears is given in the following account.

A large commercial farmer paid a nephew who was 17 years old to spray pesticides on a tomato crop. The following day the nephew who previously had had a cold (el gripe) fell violently ill and it was assumed that this came from contact with the poison he had been applying. He grew still worse and was taken to a hospital in Bonao where, after exhibiting signs of mental upset, he was taken by his mother, a sister of the farmer, to a native curer (curandero) in Bonao under whose care he gradually recovered his physical and mental strength.

The grower came under much overt criticism from his siblings and mother for allowing a boy so young to do this work. He was put under great pressure to pay the bills, both from the doctors and from the curandero, which came to over \$300. The nephew's mental affliction was a clue that more was at work in this matter than poisoning and it was suggested that the boy had been a victim of witchcraft intended for the farmer himself. Indeed the grower's daughter had once been cured by the same curandero for an infection believed to be the result of a magical powder put on the grower's path which leads from the main road to the grower's large cement block house.

In this case, the farmer paid most of the nephew's bills, though he did so grudgingly, claiming that the pesticide was not at all dangerous. However, this contention seems to have been compromised by the fact that a few months before a peón

had died under similar circumstances at the farm of another large grower; the worker had had a cold and, after spraying, had been taken ill and expired. But since this worker was an adult, a nonrelative, and a full time peón, no accusations were leveled at the grower, though the death of the worker was greatly mourned by the whole settlement.

The greatest social distance exists between the farmers and the workers at the flower growing farm in Goat owned by an association of eight individuals who live and work in the capital where several have jobs with the Ministry of Finance. The land was bought in 1974, and the association pays a permanent manager, a man from River who worked once with the American grower in Clear Creek in the late 1960's. The association owns a series of florist shops in Santo Domingo and also exports to the United States. Flowers are sent directly from the campo to the capital daily or every other day in one of the firm's three pickup trucks.

The flower growing farm has six peones, from households which border on the seven hectare farm, who work among the brilliant gladiolas, carnations, and roses. They are all from families which had once owned a part of the land though it had been sold to other parties before the association bought it. When labor needs are greatest, the manager brings five Haitian workers to the farm from the capital where they regularly work making decorative floral pieces in the back of the corporation's shops. The Haitians are paid \$.50 to \$.75 per day, and as illegal residents, they could be dispatched

across the frontier if they should demand more. Speaking only broken Spanish, they depend totally upon the manager for their food, clothing, and shelter.

Before this discussion of the mode of production in commercial agriculture is ended, however, it would be good to look at some of the characteristics of the peones in Clear Creek. In 1974, 34% of the households in the settlement had one or more members who were engaged in daylabor. Of these 41 households, 16 did no farming at all, 14 had made swidden clearings at some time during the year, and 11 were engaged in their own commercial farming ventures (Table 11). This last group was mostly engaged in working in sociedad which resembled a form of sharecropping in which their partner supplied credit, land, and equipment, and the worker supplied most but not all of the labor, with profits being split 50-50.

Daylaborers almost always are members of households which have less than .5 hectare of land. Households of peones are usually those of siblings living in the same cluster tucked into a corner of the bottomland. In many cases these peones are the sons or grandsons of original settlers who, after the creation of la zona, sold their land to men who could afford to enclose it with barbed wire. Left with parcels of land scarcely big enough for a house and garden, these men engaged in swidden farming until the advent of commercial farming.

The highest paid peones in the settlement are those who earn \$35.00 per month working in the flower farm owned by the

association in Santo Domingo. If they work twelve months a year, these daylaborers would receive a total of \$420.00 per annum, though they seldom work the whole year. Most peones work between 150 and 200 days per year, most of it in the nine month period of March through November. This gives them an income of roughly \$187.50 to \$250.00.²¹

Process of Production

Since the mode of production in commercial farming is now defined, the actual process of production in commercial farming in Clear Creek can be outlined with greater understanding. It should be emphasized that to farm successfully in this fashion, a grower must first acquire the means of production and, after his crop is grown, he must then assure himself of the proper marketing connections, requiring a set of difficult relations with outsiders. These relationships often put him in a subordinate position to large growers who are better able to manipulate such relations.

As in the previous chapter, the process of work will be outlined in a series of steps which follow the same basic pattern, despite slight variations, depending on the particular crop.

Acquisition of Necessary Inputs

The commercial farmer must obtain necessary and expensive

²¹In 1969 per capita income in the Dominican Republic was estimated to be \$295.00 (AID 1974: 72). Figuring that each peon has four dependents, the per capita income is only \$37.50 to \$50.00. This income is usually supplemented, however, by some farming (already mentioned), the making of charcoal, and other occasional labor.

inputs (fertilizer, seed, pesticides, transport) from outside the settlement while other factors may be obtained from within Clear Creek (oxen, daylaborers). For the small commercial farmer, the largest cash expenditure in farming, excluding marketing costs, is the purchase of fertilizer and pesticides. Since large amounts of cash are on hand only when the farmers win the lottery, sell land or livestock, or harvest a commercial crop, money is seldom available at planting time. Thus, purchases are not made with cash but on credit, what Ward has called "the lubricant which keeps the machinery of production going" (1967: 139).

With few exceptions, supplies for commercial farming come from an agricultural supply store in Constanza. Because Clear Creek is on a now badly eroded side road, trucks and pickups enter it only on special occasion. As a result, farmers must go to buy their supplies with two of the four truck owners in Clear Creek who have taken on the role of intermediary in transporting such goods. A third truck owner, whose vehicle is more of a status symbol than a productive capital investment, obtains only his own and his sons' supplies, while a fourth is solely used by the manager of the flower farm in Goat.

Since the two truck owners who act as intermediaries are themselves commercial farmers, they do more than transport the bags of fertilizer for \$1.00 per sack; they also are instrumental in securing credit for the majority of small farmers. One of the truck owners takes the small farmers who

need credit to Constanza, where, on his recommendation, the store keeper extends credit to them. Even after a farmer has several successful seasons, he always arrives at the store with the truck owner because the truck is the only means of getting to and from Clear Creek.

The interest rate for this credit is 80% per annum which Ramón, the truck owner, also pays on his own account. He is assured, however, of always receiving the type and quantity of supplies he personally needs. As a screening device, Ramon's recommendation is imperfect, in that persons are taken to Constanza for credit as much for their kinship relationship as for their ability to repay the loan. The store keeper compensates for bad debts in the high interest rate. At the same time, Ramon can build up political and social credit in a settlement which, while being relatively open to the economic advancements of its members, still views them as potentially subject to evils activated by envy.

The other major broker in Clear Creek is a woman who, though her husband is engaged in commercial farming, relies upon intermediary roles for making a living. This woman went to New York, returning after several years with enough money to buy a pickup and to hire a full time driver. She, or her husband who usually minds their small store, takes orders for fertilizer or pesticide and, buying them on credit in Constanza, resells at interest rates of 90% per annum plus charges for transportation.

For the majority of farmers, 80% annual interest is the

cheapest rate with which credit can be obtained. But larger farmers having over two hectares can obtain loans from the Agricultural Bank, a government agency, in La Vega, for which the government charges only 12% annual interest. Farmers use this money to pay off privately contracted debts or to buy cattle or, in some cases, to buy urban properties in Bonao, allowing the rent to pay back the loan.

Loans for production are also available to smaller farmers, especially during election years, but because these loans can seldom be obtained at the beginning of a growing season, they also pay off previous debts with the leftover money going to meet daily living expenses, medical payments or other such matters. Small farmers obtain such loans with the hope that the government (that is, in their view, the President himself) will forgive or forget the loan if they default. The farmer views the loan as a gift, one which is given in return for his political support. Such a belief is not unfounded as, in the past, the government has forgiven delinquent accounts.²²

Land Preparation

While he is trying to obtain the necessary credit and agrochemicals, the farmer must also be preparing his fields. Though the plow, which he uses, is taken as a sign of "traditional" farming methods, its use in the Dominican Republic is

²²Rates of 75% delinquency are reported elsewhere in the Dominican Republic, interestingly enough in government sponsored Agrarian Reform projects (AID 1974: 40).

actually quite recent. Until the late 19th century, the land in the Dominican Republic was recleared by fire, colín, and the hoe because the plow was virtually unknown (Hoetink 1972: 20). The lack of the plow retarded the development of more intensive farming systems and must be considered a factor in the long association between agriculture and slash and burn farming in the country. But once introduced, the use of oxen and plow spread rapidly. In 1974, for the first time in the settlement, tractors were used on two holdings both of which were more than six hectares in size and belonged to outside interests.

Plows were first used in Clear Creek several decades ago to break up bottomland which had been used for pasture and was to be planted as house gardens. Today plowing is done before each planting on commercial holdings. Peak demand for the five teams of oxen in the settlement is in February-March when the ground begins to dry out from the winter rains, becoming manageable for planting the tomatoes or cabbages which are planted, and again in July-August when beans are sown. Plowing is done by first turning over the border of a field and, then, working one's way slowly around the edge until one finishes in the middle of the field. The steepness of slopes around the settlement generally precludes the use of plows in the hills.

The cost of plowing in 1974 was roughly \$32.00 per hectare for the first pass and \$24.00 for each subsequent pass; on the average the field is plowed three times in preparation

for the spring crop and twice in July-August. The price of plowing is somewhat negotiable depending upon the condition of the soil but more intense negotiations center on figuring the actual size of the field. Since the price is based on size, growers insist their fields are smaller than they appear to the owner of the oxen team. This allows, however, for considerations of friendship or kinship to enter into fixing the price.

After plowing, the field is broken up by hoeing, utilizing the labor of hired neighbors, if the small farmers do not have enough sons within their own households. On larger farms, peones are hired for this phase. After the clods of earth have been sufficiently fractured, furrows are made by hitching another type of plow to a horse, usually the grower's own animal. These furrows which serve as ditches when the field is irrigated are gone over again with the hoe if they need deepening.

Planting

The choice of which crop should be planted and at what time is determined by the possible profit margin, expected weather conditions, and past experience. Thus, beans are planted in July-August, because the harvest thereby coincides with the peak of the annual price cycle. In 1973, for example, the price paid to farmers for a quintal (hundredweight) of beans was \$27.06 while in November it was \$37.03. In 1972 the change was even more dramatic, from \$12.72 in June

to \$32.00 in November.

Tomato and cabbage prices, however, are much more volatile and, in choosing between the two, a farmer tries to find out what is being planted elsewhere to avoid having his crop mature at a moment when the market is flooded. Exact timing, however, is spoken of in terms of luck rather than skill. In the spring of 1974, for example, a grower sold one-fourth hectare of salad tomatoes still in the field for \$1,300, representing a net profit of \$900. Three weeks later, however, the price had fallen by 60% and other growers made little if any profit.

As in swidden farming, excessive reliance upon one crop is avoided by diversifying the type and number of plants and varieties grown. In commercial farming, however, such diversity is carried out only by the larger farmers who, because of their greater contact with other farmers, store keepers, and a few government agronomists in Constanza and elsewhere, are able to learn and experiment with new crops. Of a sample of 29 of the 59 holdings in Clear Creek which grew commercial crops in the spring of 1974, for example, there were 21 plots of tomatoes, seven of cabbage, seven of potatoes, three each of onion, garlic, and pepper, and one of beets. The five largest holdings had a range of from two to six different crops but the smallest farmers grew only one crop, tomatoes or cabbages.

Another way in which some farmers diversify is that they grow three crops a year. It is primarily larger growers who

can do triple cropping because growing a crop in the winter season is considered very risky and only they could afford a loss. The influence of swidden farming figures here, however, since it allowed traditionally only two crops to be grown each year.

Spraying

The major fungicide used in Clear Creek is Dithane M-45; the main insecticides are Endrin and Parathon, all of which are imported from the United States or Europe. These chemicals are mixed with water in large barrels which stand by each commercial farm; as bags of fungicide are utilized, they are hung over posts or tomato poles to give casual evidence of the grower's modernity.

It has been shown that spraying is viewed as a hard and debilitating job, dangerous to the user's health and a cause of death. Also, its use narrows the economic base of the small farmer who cannot keep chickens or ducks due to poisoning. At the same time, farmers consider it impossible to grow any of the crops mentioned without help of insecticides. Worms, aphids, nematodes, caterpillars, and forms of fungus, especially Cladosporium sp. and Phytophthora sp., are quite common in the valley, particularly where the same fields are used year after year.

The same crop is never grown on the same plot twice in succession, so crops are rotated to a limited extent, but small farms particularly cannot allow land to go fallow for

more than a few months during the year. This constant use leads inevitably to a great buildup of pests and disease in the soil and in the immediate environs. Vegetables such as tomatoes and cabbage which are particularly susceptible to such pests must be sprayed at least once a week. In this sense, the hesitation of small farmers to grow more than two crops a year has definite ecological benefits.

Planting

Unlike crops in the subsistence complex, the vegetables planted in commercial farming require transplanting. Seedbeds, therefore, must be made, fertilized, planted and attended until ready for transferral into the main field. Transplanting occurs after the main field has been fertilized; 13-13-13 and 12-24-12 are the most heavily utilized types of fertilizer. The rising cost of fertilizer which went from \$6.25 per sack (100 lbs.) in 1973 to at least \$14.00 in the first months of 1975 is a main inflationary factor in commercial farming in the settlement. Though it is above recommended rates of application (ISA 1970), farmers apply roughly one sack of fertilizer per tarea or roughly 16 sacks per hectare. Overapplication appears to be a cause for crop loss in some cases, but in general farmers believe that this is the minimum which should be applied.

Transplanting is another labor intensive operation, for the fields must be planted smoothly and quickly for the seedlings to survive. When this process is completed, frequently there are seedlings left over in the seedbed. The farmer

always plants more seedlings than are necessary in order to have a choice among the most vigorous. The remaining seedlings are given on request to smaller more marginal farmers who want to avoid the expense of a seedbed. Furthermore, a larger farmer is able to call on the receiver of the seedlings for help in a labor shortage during, for example, the bean harvest.

Weeding

All weeding in vegetable plots is done by hand labor; herbicides are not utilized in the settlement. The tool used in weeding is the machete, a small thick bladed knife, which is wielded in short circular strokes just below the surface of the soil in order to cut the weeds off at their roots. This operation demands many hours of work and the circular arm motion has generally in Dominican body language come to symbolize all agricultural labor. In conversations about farming, this motion describes what is felt to be the brutalizing effects of agricultural work.

Weeds are also controlled partially by interplanting crops which provide a thick enough shade to discourage some of the unwanted plants. Interplanting also provides a way by which small farmers can diversify their crops by applying the swidden practice of multicropping with familiar plants. Most commonly beans are planted between rows of tomatoes, corn among beans, and corn plus yuca among cabbage. These crops are staggered in their planting so that the field continues to produce after the main cash crop has been taken

off. Interplanting significantly raises the total harvest of a field, particularly when measured in terms of calories produced (Table 8). In addition, it spreads out the effects of fertilizers and chemicals which give these plants some protection. As in swidden it provides a means of protecting the farmer by spreading his risk.

Harvesting and Marketing

In commercial farming, only a small fraction of production enters into the kitchens of local households. With the exception of beans and potatoes, commercial crops are not a part of the regular diet. The strategy in commercial farming is quite obviously to sell produce in order to buy staple foods, to pay off debts, and to buy consumer items ranging from radios to pistols.

The type of harvesting process used depends upon the crop and its characteristics. On even the smallest holding, some hired labor is used to harvest cabbage because a great many heads must be cut, packed, and sent off to market with a minimum of time or they will get soft, a particular danger if they are being taken to market under a hot sun. Tomatoes, on the other hand, may be picked over a period of several weeks, especially since they do not have to be harvested ripe. The farmer is less pressured under these circumstances and is better able to space his labor needs so as to rely less on peones.

An elaborate division of labor is involved in the bean

harvest in response to the need to separate seeds from pods for storage or marketing. After the women pick and dry the beans, the men take large piles of pods to the threshing floor where they beat the pods with long sticks in rhythm, bursting the pods open, allowing the beans to fly out. The women then sift the beans on great wooden trays to separate the beans from the pods. These women receive no wages but are allowed to collect and keep those beans which fall outside the threshing circle. Set to the rhythm of the threshing are songs, plenas, which are sung with increasing gusto as the grower passes around the omnipresent bottle of rum among the men. In this harvest, the farmer, whether large or small, affirms his relations to a large network of individuals.

The grower asks the help of those to whom he may have lent some machinery or other aid during the year. Women from neighboring households are willing to work because of the share of the harvest they receive from gleening. Some day-laborers are also hired. As many as fifteen or twenty people may take part. The bean harvest, like the fiestas at Christmas, is a means for the large farmer to reaffirm his ties to the settlement.

Like harvesting, the pattern of marketing is different depending upon the crop concerned. Beans are sold to middlemen who come into Clear Creek in small pickups and trucks and buy the harvest directly from the farmer, except for swidden growers who, living far from the settlement's road, sell to local store owners. Perishable crops are either sold in the

field or, more commonly, are taken by truck owners along with the farmer to the central wholesale markets in Santo Domingo. In either case, the Dominican marketing pattern, described elsewhere by Norvell and Billingsley, is characterized by the presence of motorized intermediaries who link farmers and wholesalers (1971).²³ Wholesalers operate in urban marketplaces where they break down shipments for sale in supermarkets, in urban pulperias (small stores), or in the streets by vendors whose morning cries ring through the middle class sections of every Dominican city. Taxes are collected at these central marketplaces on truckloads of produce and fees must also be paid to the market administration by the wholesaler and the few retailers who sell under its jurisdiction.

Beans, along with rice, are important staples in the Dominican economy and, therefore, their sale and distribution are more tightly controlled. The government tries to regulate the annual price fluctuations by warehousing and selling a large portion of the national harvest. Middlemen also attempt to store the beans in order to take advantage of higher price peaks. Both middlemen and the government send out agents to buy harvests. During the fall of 1973 when bean prices were higher than in anyone's memory, buyers entered Clear Creek in great numbers, each in a small truck or pickup, making contracts for crops. Farmers knew from past experience

²³In this sense, marketing patterns in the Dominican Republic bear little resemblance to the petty trading and cyclical marketing schemes described elsewhere in the Caribbean (Katzin 1960, Legerman 1971, Mintz, 1964, 1974). Near the Haitian border, however, such cyclical patterns are found and also in the Samana Peninsula, both areas heavily influenced by Afro-American traditions.

that by mid-November the price would begin to fall as beans from San Jose de Ocoa, another mountainous region, entered the harvest stage.

The numerous buyers who came from Jaravacoa, Bonaó, Santiago, Santo Domingo, and as far away as San Francisco de Macoris, bid against one another. When a farmer was finally made an offer he could not refuse, if only for fear the price would begin to fall the next day, he would agree to deliver his harvest at the set price. If his beans were ready to be threshed, the buyer would give him the necessary sacks which, in the absence of any written agreement, symbolized their agreement. In general, the farmers sold under very favorable circumstances; some 708 quintales (hundredweight) were produced by the settlement's farmers, including swidden farmers, which brought in a gross total of \$27,796. More than one-fifth of this production, however, came from only three large growers.

During the period in which the beans were being sold, traveling salesmen in pickups and small trucks, equipped with loudspeakers, would arrive in great numbers, announcing bargain specialis on clothing, furniture, wristwatches, and a myriad of manufactured items. These pickups would stop in front of the small stores in Clear Creek and would soon be surrounded by farmers, their wives and children looking over and buying the wares. Polyester fabric and wristwatches were particularly popular, the latter being highly prized especially by the men. Many of these were sold, however, again in January and February to pay for debts incurred in the large fiestas

which take place during the Christmas season.

The harvest of vegetables like tomatoes and cabbage is quite different because these items are highly perishable and therefore their price fluctuates in shorter and more volatile cycles. Because they cannot be stored, the commercial farmer must sell at whatever price he can get when the crops are ready for picking. Farmers must therefore contract for their own transportation, since outside intermediaries cannot be counted on to enter the settlement when the crop is ready to be picked. Almost 90% of these vegetables are marketed in Santo Domingo where the produce is broken down for consumption in the capital itself or for shipment to other cities.

The farmer would much prefer to sell crops in the fields to an intermediary rather than go to the city, paying the transport costs equal to the whole cost of production to a truck owner (Table 10). In addition, farmers who are illiterate and unfamiliar with numerical calculations find the central markets frightening and confusing, a scene of great noise and competition, a dangerous place where tigres (liars and cheats) can easily and often do take advantage of their inexperience.

Although farmers prefer to sell their crops in the field, any offer they receive is weighed against what limited information they have about prices in the cities. Farmers seldom believe the wholesale price quoted to them by intermediaries with good reason. If there is too much of a discrepancy between the quoted and the believed price, the farmer insists on selling the produce himself. In this case the farmer must make a

contract, based on a set fee, with the owner of a truck to take it to the city and sell it himself. The fees in the spring of 1974 were \$2.00 per crate of tomatoes (roughly 80 lbs.) and \$22.50 per 1,000 head of cabbage which amounted to roughly 20-40% of the selling price.

Once a marketing contract has been made, the harvesting of the vegetables can begin. Timing is crucial and, unless a truck is ready to go, the crops will not be picked. Harvesting must be done with care as price is partly a function of the quality of the produce; tomatoes are crated according to two classes, good and fair, and farmers select out the produce which a wholesaler would have cause to reject. The selection process, however, is understandably more stringent for vegetables which are placed at the top of a pile or a crate than for those which lie hidden closer to the bottom.

While the actual marketing confrontation can be traumatic for a farmer, the trip to the capital is viewed as an adventure. Produce-laden trucks leave Clear Creek in the afternoon and, after the four hour trip, arrive in darkness at Santo Domingo. There are three central markets which distribute fresh produce and they are ringed by cheap hotels, brothels, and bars; here the grower and truck owner spend the night, allaying the farmer's anxiety about the morning sale with the pleasures of the night. Since the farmer pays for the truck owner's expenses, a good part of potential profits may be spent.

In addition to expenses for room, board, and entertain-

ment, the farmer must pay police to "guard" the truck during the night as well as a "tax" to the highway patrol between Bonao and Santo Domingo and a fee to the market administration. In the morning the men enter the market and are beseiged by a number of buyers if demand for their produce is high or search out a buyer if demand is low. The farmer's relations to the truck owner are of critical importance in the market. The small farmer who goes to market only once or twice a year is not only ill at ease with the pricing system, he is bereft of the ties of kinship and friendship which reassure him and protect him within the settlement.

Hence a farmer is hesitant to make a trip to the capital to sell unless he is accompanied by a truck owner whom he knows and trusts. Because of the frequency with which they market their own and other farmer's produce, these truck owners have crosscutting ties, again lubricated with credit, which link them to certain wholesalers who can be counted on to give them a good price in a fair market or a fair price in a bad market. These ties are the Dominican counterpart to the type of relations which exist between petty traders in the marketing systems of Haiti and elsewhere (Mintz 1961). Because of the frequency of their economic interaction, the wholesaler and the truck owner (especially since the truck owner is usually a large farmer himself) even out fluctuations in quality, quantity and cost to their mutual benefit. The flexible dealing between trucker and wholesaler acts as an informal cushion against price fluctuations as well as an

extension of personal reciprocities into the otherwise impersonal market exchange. The truck owner, as in the obtaining of credit, extends this relationship to the farmer whom he has brought to the market.

Once an agreement is struck and the crop is paid for, the farmer pays the truck owner his charges. The farmer then purchases staples in the large stores which are found in the market area. These staples include at least a sack of rice and a gallon of cooking oil. He must also buy a few small gifts for members of his household. For small farmers, the marketing journey is the only time during the year that they venture as far as the capital, but they seldom linger to see the commercial downtown, the middle class residential areas or even the ocean on whose shore the city is built.

The productive process of commercial farming in Clear Creek, in summary, is marked by differences in access to productive inputs and marketing mechanisms for the large and small growers. At both ends of the productive process, the farmer is linked to middlemen, on the one hand the Constanza storekeeper and on the other the urban wholesaler. To successfully grow a crop, the farmer must become involved in a set of market exchanges with these individuals in which he is at a disadvantage due to his small scale, his product's perishability, and his lack of economic savvy.

These exchanges, however, can be smoothed for smaller farmers if they link themselves to large growers, especially those who have trucks, who act as intermediaries in securing

necessary credit and in selling produce. Though the structure of these relationships changes according to the crop grown by the farmer, at each stage he must pay a price for these linkages, either through credit, transport costs, or through a willingness to acknowledge the large farmer as a leader in local affairs.

Within the productive process itself, even a small farmer must at times hire other residents to work for him. Through such hiring the farmer gains some prestige for "giving work," while the peón loses some for accepting a subordinate position on someone else's holding. The difference between a farmer and a peón, therefore, becomes an important fracture line for social divisions within the settlement.

What the farmer makes in profit, especially if he is a small grower, flows out of the settlement either through the purchasing of food from middlemen in the urban market, the paying of interest on outstanding debts or the purchase of consumer goods. This last group of items comes to stand for the farmer's modernity; the desire for wristwatches in a place where time is still measured by day length and season is a powerful symbol of this. Such items symbolize the fruits of a farming system which is, to him, advanced as opposed to swidden which is viewed as backward.

But the key to commercial farming, the need to acquire outside energy subsidies, is the topic which must be further explained in order to understand the rapid and sharp social changes resulting from this adaptive strategy.

Energy Flow and Evaluation

Figure 12 and Table 9 summarize some of the statements which have been made so far concerning the relationship between energy inputs and commercial farming in a visual and quantitative manner. The level of manpower in vegetable production is low compared to other types of energy being utilized, though this varies according to the crop being grown (Table 9). Human labor supplies less than one-sixth of the calories which are expended in the growing of a commercial crop. The largest inputs come from the fossil fuel industry with smaller amounts being furnished by oxen. Without these inputs from the outside, commercial farming in the settlement would collapse (Figure 12). It is this energy factor which makes the relationships with outside suppliers so important. The type and amount of input varies with the crop being grown; tomatoes, for example, require more human labor than beans because they must be tied to poles and more carefully weeded. Also the mix of crops which may be interplanted varies considerably, which makes an important ratio in the actual rate of return.

The rate of return in commercial farming is low relative to swidden farming if only human inputs are considered. Table shows a rate of return of roughly 1:4, that is, for every one calorie of energy expended only four are returned, while the figure in swidden farming was 1:18. This relative inefficiency is related to the necessity of maintaining and supporting crops which, when grown in a monoculture, are extremely susceptible to disease and pests. It is also related to the

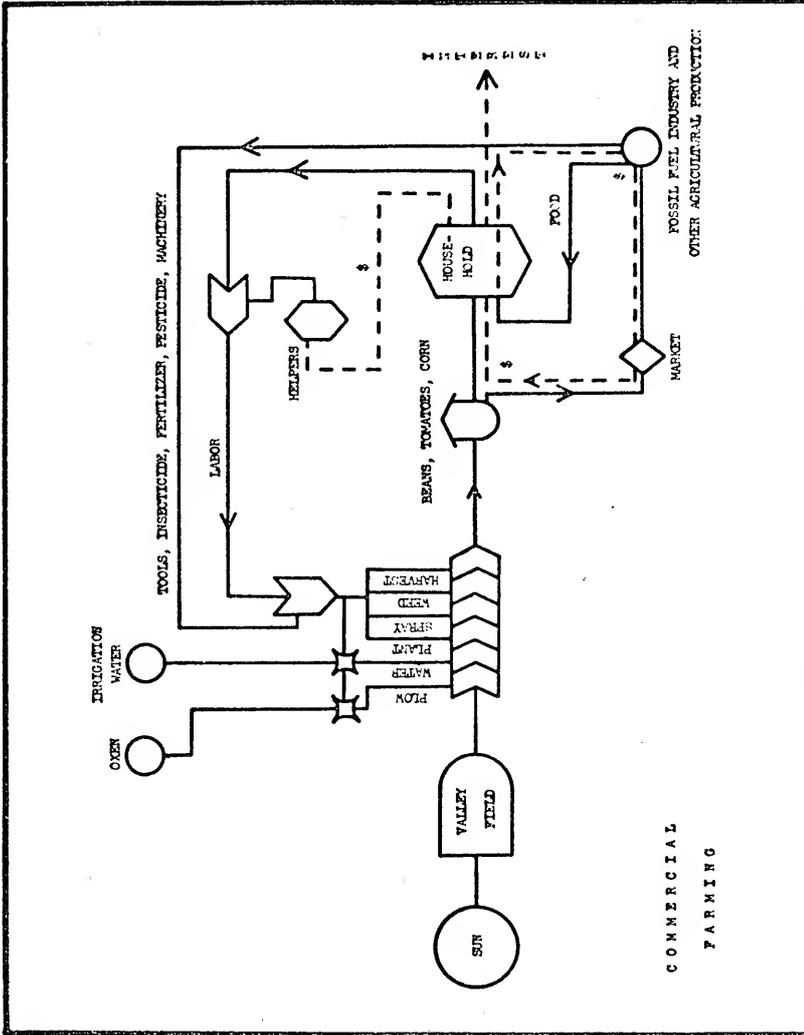


FIGURE 12

Energy flow in commercial farming.

TABLE 9

Energy budget for commercial agriculture

 Work hours per hectare (one year, two seasons: tomato + beans)

<u>ACTIVITY</u>	<u>HOURS REQUIRED</u>
Plow	54
Plant	20
Transplant	101
Place poles and tie	303
Weed	543
Spray and fertilize	281
Harvest	<u>449</u>
Total	1,751

 Human energy inputs per hectare

<u>INPUT</u>	<u>AMOUNT</u>	<u>KILOCALORIES</u>
Labor	1,751 hrs.	335,300
Oxen	22 hrs.	271,700
Machinery	45 kg.	207,120
Fertilizer	795 kg.	1,118,912
Fungicide + insecticide	19 kg.	218,543

 Energy returns per hectare of commercial tomato production

<u>OUTPUT</u>	<u>AMOUNT</u>	<u>KILOCALORIES</u>
Tomatoes	34,363 kg.	4,123,560
Beans (intercropped)	784 kg.	<u>1,176,000</u>
Total		5,299,560

 Ratio of human energy input to output 1:2 kilocalories
 (first season)

TABLE 9 (continued)

 Human energy inputs per hectare (beans)

<u>INPUT</u>	<u>AMOUNT</u>	<u>KILOCALORIES</u>
Labor	1,072 hrs.	203,840
Oxen	54 hrs.	271,700
Machinery (accounted for)		
Fertilizer	391 kg.	530,565
Insecticide + fungicide	7 kg.	<u>80,514</u>
Total		1,086,619

 Energy returns per hectare (beans)

<u>OUTPUT</u>	<u>AMOUNT</u>	<u>KILOCALORIES</u>
Beans	1,282 kg.	1,923,000
Maize	1,323 kg.	<u>4,776,030</u>
Total		6,699,030

RATIO OF ENERGY INPUT TO OUTPUT 1:6

AVERAGE RATIO FOR TWO SEASONS OF COMMERCIAL FARMING 1:4

* These figures are based on a survey of 30 commercial farmers for two very good harvests: the bean harvest of fall 1973 and the tomato harvest of spring 1974.

nature of the plants grown. Sweet potatoes, for example, have 148 kcal per 100 gram portion, but tomatoes have a mere 21 kcal and cabbage only 28 kcal (INCAP 1964). Beans, on the other hand, do have a high caloric value, but they produce much less per hectare than do sweet potatoes.

Commercial farming can be said to be more efficient, however, when other inputs, such as solar energy are considered. Given the need for a ten year regeneration period in swidden farming, solar energy contributes 542 calories for every one taken calorie off as a food crop. In commercial farming, however, where only a three month growing period is needed, only 13 calories of solar energy are needed for one food calorie.

Further, the modern techniques allow the growing of crops of a type and on a scale which bring greater cash return to farmers than the traditional methods. An income in the 1973-1974 season for commercial farmers based on the figures in Table 9 is presented in Table 10, though this must be considered to be on the high end of the income scale. The cash generated by commercial agriculture is subsequently invested in cattle, in part, which leads to large growers gradual direction of swidden farming to obtain new pasture. Other investments, in pulperías and in the rifa, are examined in the following chapter. For large growers, income is higher due to their ability to get cheap credit and their ownership of transport vehicle.

Farming in Clear Creek, then, is changing not in response to the need to raise more food more efficiently, but to the

TABLE 10

Commercial farm income (based on Table 8)

<u>COSTS</u>			
<u>FACTOR</u>	<u>AMOUNT</u>	<u>COST PER UNIT</u>	<u>COST</u>
Fertilizer	1,186 kg.	8.00/ <u>quintal</u>	210.84
Fungicide + Insecticide	26 kg.	5.60/kg.	145.60
Plowing	5 times	136.00/ha.	136.00
Labor	2,823 hrs.	1.50/8 hr. day	529.31
Transport	34,363 kg.	1.50 <u>quintal</u> of tomatoes	1,145.43
Transport of fertilizer	26 <u>quintales</u>	1.00/ <u>quintal</u>	26.00
Interest	6 months	80% per annum	<u>142.58</u>
TOTAL COST			2,335.76
<u>RETURNS</u>			
<u>PRODUCT</u> ,	<u>AMOUNT</u>	<u>PRICE PER UNIT</u>	<u>PRICE</u>
Tomatoes	22,885 kg.	5.00/ <u>quintal</u> of first class	2,517.35
	11,340 kg.	2.00/ <u>quintal</u> of second class	498.96
Beans (June)	784 kg.	28.00/ <u>quintal</u>	482.94
(November)	1,282 kg.	40.00/ <u>quintal</u>	1,128.16
Maize	1,323 kg.	8.00/ <u>quintal</u>	<u>232.85</u>
TOTAL RETURNS			\$4,860.26
		TOTAL RETURNS	4,860.26
		TOTAL COST	<u>2,335.76</u>
		PROFIT	\$2,524.24

need to raise cash income. Hence the most successful farm in the settlement is one which does not grow any food crops at all, but rather grows flowers to be sold to an urban middle class either in Santo Domingo or in the United States.

Summary

The need of commercial farmers to rely upon outside sources of energy and agricultural supplies obtained only by cash or credit alters key aspects of Clear Creek's earlier adaptive strategy. The mode of production in commercial farming breaks out of the household and the labor exchange relations which characterize slash and burn farming. Because the commercial farmer must buy his material inputs and because he works for a cash profit, individuals who work with him expect the same. The percentage and type of labor which is hired, however, depend upon the size of a particular operation.

In the productive process, large growers have distinct advantages over smaller growers especially when large size is combined with the ownership of a vehicle. These advantages include cheaper credit, advantageous friendships with suppliers and wholesalers, and easier access to information which allows the risk-lowering diversification of crops and cattle. The advantages of friendship with suppliers and wholesalers are passed to smaller growers at a price; smaller farmers pay dearly for transportation costs, and, in addition, are expected to lend their social and political support to the large farmers.

An examination of the flow and sources of energy utilized in commercial farming shows that this agricultural system is not a particularly efficient one in terms of its caloric return. Further, its efficiency in creating a cash income depends largely upon the extent of the farmer's size and his ability to manipulate credit, labor, and transport. Thus, a pattern is emerging in the settlement which represents an integral part of its agricultural development, namely, the rapid absorption of smaller holdings in the llanos and hillside pasture by large growers and outsiders who are able to secure the necessary energy inputs in spite of changes in national and international markets.

CHAPTER V
ECONOMIC ROLES AND LINKAGES

This chapter broadens the description of the Clear Creek economy to include more than the two major adaptive strategies. The concern is with understanding the various monetary linkages which connect households in the settlement with each other and with the outside. Large farmers in Clear Creek have been shown to have the function of linking small farmers to credit and marketing channels. But, in addition, there are four distinct economic roles which have significant relevance for understanding agricultural development in Clear Creek: those of store owner, lottery seller, government employee, and migrant.²⁴

The greater circulation of cash in Clear Creek has led to larger numbers of residents adopting these roles. Furthermore, the system of commercial agriculture, itself, tends to extract economic roles from the familial context in which they are found in subsistence agriculture. This process of specialization exemplifies the classic change from Gemeinschaft (integrated, cooperative, reciprocal) relations such as those which characterize swidden farming to Gesellschaft (specialized,

²⁴In the introductory chapter, economic role was defined as an occupational category, involving a set of specific behaviors which occupy a distinct niche in the economic system.

Migrants who will be discussed in this same chapter do not form an occupational category in this same sense since the actual work they perform outside the campo varies from that of

separated, cash) relations which characterize commercial farming (Toïñnes 1887). An indication of the segmentation of social from economic roles is demonstrated by the fact that women, as well as men, take on these new, specialized economic roles. For example, females operate three of the twelve pulperías (small stores); a woman is one of the 14 riferos (lottery sellers); and also a woman is one of the government employees. The fact that women have greater access to a variety of economic roles is in sharp contrast to the Gemeinschaft community in which the division of labor by sex roles is a basic principle.

All of these roles involve making various transactions which link households to each other and to the outside through market exchange. Store owners, for example, sell goods to the settlement residents for ^{CASH} ~~each~~ and credit. Like other middlemen already discussed (the agricultural suppliers, the market wholesalers, the truck owners), the store owners charge for their service, but, at the same time, their pulperías serve two or three household clusters to which the owners invariably belong. Store owners must extend credit to their neighbors and relatives in order to secure their business since cash income in most households arrives only during the harvest season. The owner, therefore, must combine his pulpería with other forms of enterprise to maintain sufficient cash flow to cover his own debts to the wholesaler.

Brooklyn bus boy to a Santo Domingo rifero. Nevertheless, they perform an economic linking function for the settlement which fits them into the present discussion. Therefore, the role of migrant will be herein treated as an economic role.

Lottery sellers (riferos) link local households through a popular gambling scheme. The illegal lottery in which they engage mirrors the national lottery in all respects except that, while the national contest generates revenue for the government, this lottery generates income for the rifero and his backer. Overtly, the rifa, as the lottery is called, is a means by which individuals can gamble in the hope of transforming a \$.25 number into a \$14.00 winner. Its covert function, however, is that it forms a crude savings institution and helps to amass money in a settlement where large sums of money at any time are otherwise very difficult to obtain.

Government employees, on the other hand, receive wages as part of the political and bureaucratic apparatus of the Dominican state. They are the only persons in the settlement, except for resident social scientists, who, as the expression goes, live by check (los que viven por cheque). In Clear Creek there are two forestry agents, two school teachers, and one alcalde (sheriff) who receive monthly payments for their services.

An important aspect of this discussion is that, except for the teachers who earn \$90 per month (\$1080 per annum), none of these economic roles by itself brings more than a minimal income to its practitioner. In addition to being an alternative to farming, however, their economic viability lies in the possibility of combining government jobs with one another and with commercial farming. Such combinations make it possible for some individuals, particularly large growers, to diversify their risks and to exercise better control over

the various transfers of cash and energy. In this, there is a parallel to the diversity of the crops and the spreading of risk in the primitive conuco of the swidden farmer.

Pulpería Owners

The intermediaries who own pulperías in Clear Creek link households to a limited range of processed foods and consumer goods, which are produced outside the settlement. Like the agricultural supplier in Constanza, the pulpería owner must extend credit to gain and keep his clients who are usually neighbors and kinsmen but not to the point where the store is "broken" by the customers. To keep up liquidity, the store-owner must therefore devise stratagems which will bring in a flow of cash and some small profit, for only as a pulpería is reinforced by subsidiary activities can the enterprise flourish.

An examination of that enterprise must begin with a discussion of its spatial characteristics, of which an important aspect is the distribution of stores in the settlement. There were 14 pulperías in Clear Creek when I first arrived, but two were "broken" during my stay, leaving a total of 12, a ratio of roughly one for every ten households. Most of these 12 are located along the road. The two largest are located at the junctures of the small valleys into which the settlement is divided, within the main commercial farming areas, that is, where the valleys become widest and where cash income is higher. The smallest pulperías, on the other hand, are encountered in the further reaches of Pines, Goat, and Nuts,

where the stores are very poorly stocked.

Three-fourths of the pulperías are simply rooms added onto an already existing house, but the largest are separate buildings, sometimes referred to as bodegas.²⁵ Stores which are attached indicate a smaller sales volume and the fact that the owner aims to provision his own household as well as provide a middleman service. Whether attached or separate, however, the interior use of space is invariably the same because the pulperia, like the house and yard, is a symbolic center of economic life and its form is recreated in every Dominican settlement.

Within the store, the main division of space is a waist-high counter which separates clients from the owner. On the client's side, a few chairs or benches invite sitting and socialization while on the other, commodities are arranged in sacks, bottles, and tins. Over the counter hangs a scale whose debatable accuracy is frequently a topic of heated discussion. On the counter itself are at least two display boxes, one holding bread, cheese, and sweet cakes while the other contains a variety of industrial products: notebooks, pens, plastic combs, thread, hair rollers, flashlight batteries, and shoelaces.

Against the back wall are arranged the commodities, most prominent of which are long rows of bottles on narrow shelves: rum, whiskey, beer, soda, and malt liquor, all of whose virtues

²⁵For a classification of such shops in an urban setting see Norvell and Billingsley 1971.

along with cigarettes, are continually and loudly extolled by Dominican radio. Below these items, the shelves hold tins and packages of processed foods. Inevitably these include cans of sardines from Southwest Africa, sweetened and condensed milk, chicken boullion cubes, tomato sauce, vinegar, and chocolate squares. On a broad shelf which runs level to the counter are found those small items which sell more rapidly: penny candies, cookies, cigarettes, chewing gum, and andullo (strong, pressed tobacco used for pipe smoking). On the floor are hundredweight sacks of rice, sugar, salt, boxes of spaghetti and noodles, and a drum of kerosene and another of cooking oil.

Amidst all of this hang plastic bags of bread, lengths of salami, and spices: cinnamon, cloves, allspice, garlic, perhaps a few onions. If the owner can afford the price, there will be a kerosene refrigerator off to one side. Paid for on monthly installments, the refrigerator represents the owner's largest overhead expense except for the extension of credit. The refrigerator, however, is seldom stocked with anything more than beer and soda; "ice cream" is made by freezing syrups in the cube trays.

The daily transactions which occur over the counter are divided into two main spheres, one involving the purchase of staples on credit and the other involving the purchase of less basic commodities with cash. The purchase of staples takes place under the direction of women who do the household cooking; children are usually sent to the pulperia to get the goods whose cost is noted in the owner's credit book. These purchases

provide the main meal of the day, la comida, which should ideally consist of rice, beans, and possibly meat which can be bought several times a week, depending upon when the butcher obtains an animal for slaughter.²⁶

There is tremendous variability, however, in the amounts which households purchase. The most basic commodities, salt, cooking oil, and sugar, must still be bought daily by households, such as those of swidden farmers, who may eat rice and beans only every three or four days, except when one or the other is being harvested from the conuco. In the fall of 1974, the minimum expenditure at the pulpería would be about \$.45 per day for households practicing swidden farming.

In the households other than those devoted to swidden agriculture, however, there is a greater dependence upon the store. In these households the diet contains rice and beans four or more times during the week. In addition, condiments and items such as tomato sauce or sardines would be added in the food preparation process. In the household cluster examined in some detail in chapter one, an average of \$.75 per day per household was spent at the local pulpería throughout the year. Households of small commercial farmers spent a bit more while those of large growers spent upwards of \$2.00 since these households would get several pounds of meat whenever it was available.

²⁶In an average week, the butcher estimated he sold 300 pounds of meat, most of it pork, for between \$.60 and \$.75 per pound. This would equal .43 pounds of meat per resident per week if it were evenly distributed which, of course, it is not. Households which are able to keep their own small domestic animals are able to eat their own production; a two or three pound chicken every three or four weeks.

On an annual basis, this means that a household practicing swidden farming in Clear Creek spends a minimum of \$165.00 for staples at the pulpería while small commercial farmers spend upwards of \$310.00 with peones, riferos, and non-farming households falling in the middle. On the lower end of the scale, such figures roughly equal many households' annual incomes. This expenditure is exclusive of the tobacco which every adult smokes, clothing, medicine, and other expenses.

The high cost of maintaining a basic diet means that the household must constantly remain in debt to the pulpería. On the household level this chronic debt means that there is constant pressure to pursue cash-producing activities rather than subsistence ones. On the pulpería level, it means that extension of credit is a constant overhead expense for which compensation must somehow be made.

The need for credit is directly related to the proliferation of pulperías, roughly one for every ten households in Clear Creek. Capital is scarce and comes to farmers in lump sums only at harvest, at the sale of animals or land, or at the winning of the lottery. Credit becomes necessary to tide households over the weeks and months where there is little money. But understandably, credit cannot be extended to everyone for not everyone can be trusted to repay debts.

Therefore, credit is limited to neighbors and kinsmen, the definition of these categories being sufficiently flexible to include more solvent but distant households and exclude closer but more destitute ones. Repayment is more sure where kinship and residence ties reinforce the owner-client relation-

ship. Further, if there are multiple ties, the owner will learn sooner and more accurately of any cash the client may earn and, thus, be able to demand his share. But neighbors and kinsmen may feel that credit is due them as part of the reciprocities which normally exist among those who share family and residence and become a drain on the pulpería's limited resources.

Thus, on occasion, an owner may find himself overextended in credit and, unable to collect on debts, his pulpería goes broke. This breaking of a store occurred during my residence to a neighbor who attempted to begin a pulpería by buying \$8-\$10 of bread per week and reselling it at the usual 25% markup. He sold the bread in the living room of his house which was built right on the road. Being the first building at the entrance to Clear Creek from Black Stone, this was an excellent location. But after several weeks, he stopped the operation because he could not cover his costs. He was selling roughly 40% of his stock on credit and could not continue buying bread from the delivery truck which comes once a week to the settlement. Nor would his debtors pay him back; pleading poverty, they claimed they did not have the money. A list of his debtors revealed that his brothers and closest neighbors were the main defaulters.

In this case, the novice owner was hardly helped by his wife who, illiterate and unable to sum correctly, was often left to mind the store. More significant, however, was the fact that my neighbor was unable to establish a viable client-

owner relationship where only kinship and friendship had operated before. He was unable to separate himself from the ongoing reciprocal relations and his brothers merely joked when he mentioned their debts, saying he would have to have patience. In other contexts, however, they stated individually that they thought the enterprise would fail anyway and so were not going to pay if others were not.

The problem for a pulpería owner, therefore, is to strike a balance between his specific economic function as a middleman and his vital membership in kinship and residence networks. He cannot alienate the households which bring him the main portion of his business or they will buy elsewhere or someone else nearby will begin another pulpería, which will absorb his clients. At the same time, he must make sufficiently strong his own position so that they will pay their debts. This same kind of tension has been shown to exist earlier in this study with the neighbor who works part time for a commercial farmer or the large grower who separates himself from his kinsmen but still needs their moral and political support. Generally faced with problems of a small volume, competition from other pulperías, and the high overhead of credit extension, the store owner does not appear to make any great income on his sales and he, therefore, must seek other means to make his business profitable. One of the owners of a small pulpería located in Goat kept records of his own purchases over a three month period. He bought a weekly average of \$73.00 worth of food to which he added an average 15% markup and sold

regularly to 12 households, of whom only three were engaged in commercial farming. This gave him a weekly profit of some \$10.59. On an annual basis this would equal some \$550 if it were not for the question of credit extension. The owner claimed that because he was able to collect on only a small portion of his outstanding debts, he made less than \$200 during the previous year and though this may be exaggerated, he often did have difficulty paying off his own debt to the wholesaler who carried him several weeks behind in payments. The main advantage, the owner felt, for having a store was that he could eat out of his own stocks without cost and this allowed him to spend his earnings on medicine for his chronic asthma and for his wife who, after having 14 miscarriages, was still trying to have a child.

The owner of a pulpería has several alternatives open to him to increase his cash flow. One way is to increase the amount of his cash sales. Small scale purchases of non-staples such as cigarettes, candy, soda, etc. are paid for in cash rather than credit. These transactions vary from \$.01 to \$.30 and the items are consumed on the premises. Cash purchases can be increased by locating one's shop close to the main road and by making the ambiente (atmosphere) as pleasant as possible. By having a radio on and talk flowing at a steady rate, passersby are encouraged to stop and the pulpería develops a clientele which congregates there in nonworking hours.

Through the day males occupy the seats and benches on

the client's side of the pulpería. Adult males gather in the afternoon to gossip and to discuss farming prices and to tell and retell stories. In the evening, when married males are in their own kitchens or visiting those of neighbors, single males gather to talk, play cards and dominoes, and if they have been working, buy some refreshment. In the larger stores, a room, also used for storage, is set aside for such purposes. It is in such rooms that fiestas are held during the Christmas season. One of the more successful owners has built a shed alongside his store under whose tin roof sits a battered pool table. Pool, a game played heavily by males, attracts additional business to his store and he profits from a charge of \$.10 per game.

Besides increasing the proportion of cash sales, some pulpería owners charge an informal interest on their credit by adding purchases to the client's bill which never transpired. Since credit records are kept by the owners and not by the clients, this is easy to do. But it also has dangers, and shops do lose business if suspected of such practices.

To reduce their debt, households may frequently sell small amounts of beans or coffee to the pulpería owner who buys at roughly 25% under the price that could be obtained from other buyers. The pulpería owner bulks these small quantities and makes the sale himself. Swidden farmers sell their bean harvest in this manner for living at a distance from the main road it is difficult for them to contact other buyers. Though the coffee groves which surround the bohíos

are principally for household consumption, small amounts of the harvest are often sold to the pulpería owners. The small pulpería owner discussed earlier made \$35.00 in 1973-74 in such transactions on top of his retail profits.

Another way for the owner to increase his profit margin is to link the pulpería with another enterprise, for example, three-quarters of the pulpería owners also practice commercial farming (Table 11). When these farmers hire peones, their laborers get credit against their wages in the farmer's store. This means that the farmer makes a loop with the flow of cash, paying off his workers who then give him back an immediate return by paying for their credit purchases.

An owner can greatly increase his profits if he has a truck, as two pulpería owners do. With a truck, a middleman can bring supplies into the settlement, thus avoiding the payment to a wholesaler who otherwise supplies the pulpería from his own wagon. For this service a wholesaler charges a 15% markup. With his own truck the pulpería owner can make roughly 30% on his retail prices. If he can double as a commercial farmer and a truck owner, a pulpería owner is better able to control the flow of goods and services in the settlement, making a profit at each transfer point.

In summary, the pulpería acts as an economic counterpoint to the house and yard, and symbolizes the opposition of market exchange to the reciprocities of the hearth. The pulpería owner links the settlement and the outside through a flow of goods, mostly processed foods, on whose sale he makes

TABLE 11
 Relation of household adaptive strategy to economic roles in Clear Creek

ADAPTIVE STRATEGY	ECONOMIC ROLE			
	<u>RIFERO</u>	GOVERNMENT	<u>PULPERIA</u> OWNER	DAYLABORER
Commercial	2	0	9	11**
Swidden	1	1	0	14
Neither	11	4	3	16
Total	14	5	12	41

* Includes only households in which regular day wages are received.

** 9 of these were sociedad relationships in which the peon, though officially a partner in the crop, contributed most of the labor in return for 50% of the profits, his partner providing the land, credit, and other inputs.

some small profit. While the extension of credit assures him customers, it also means a relatively low return. To increase his profits, he must resort to other strategies which have been discussed above. Another strategem sometimes followed by pulpería owners will be discussed below, namely the backing of a rifero in his numbers game.

Riferos

The rifero (lottery seller) makes a different type of transaction from that of the pulpería owner. Unlike the latter who exchanges goods for cash, the rifero operates a numbers game which provides a chance to parlay a small sum of money, \$.25, into a large sum, \$14.00. Thus the winner obtains a sum with which he can pay off some of his debts, buy consumer goods, or make an investment. The rifero, for his part, makes his living based upon the premise that, in the long run, people lose more than they win.

Virtually all households in the settlement are visited two or more times a day by riferos selling the hope of a temporary escape from poverty. In 1974, there were some 14 full time riferos who together sold between \$300.00 and \$525.00 worth of numbers (\$.25 each) each week in Clear Creek. Riferos follow set routes five or six days a week, each week of the year, which makes it impossible to combine their work with commercial or swidden farming, except if there be other adult males in their household. The role of rifero, therefore, acts as an alternative to that of the peón. But unlike the latter

it cannot be taken up on a casual basis owing to the fact that the rifero must constantly generate cash to cover potential losses.

The rifero bases the numbers game on the national weekly lottery. The national lottery has several variations, but the most popular is that of the ^(QUINIELA) quinela, a two digit number which pays \$14, \$3, and \$2 if it is drawn in the first, second, or third position. The drawing of numbers takes place each Sunday at noon and is broadcast over national radio, including one beamed at the Dominican community in New York.

The ^(QUINIELERO) quinelero sells government-issued tickets for this lottery. These tickets, purchased as five series of 100 numbers (00-99) cost the quinelero \$132.00. He sells each number on a scale of prices from \$.25 to \$.50 each, depending on the popularity of the number and the day of the week. Prices lower toward the end of the week and on Sunday morning the quineleros crowd together on busy street intersections in all Dominican cities where buyers descend in droves to make their last minute purchases.

In contrast, the rifero does not purchase the government issued tickets and he avoids both the expense and the security of the national system. While there is no outlay for tickets, the riferos must pay winners out of their own resources. The national winners, on the other hand, redeem their tickets at any branch of the National Bank. If all of the rifero's numbers are sold, this will bring him \$25 for each series out of which he must pay \$19 to the three winners who get \$14, \$3, and

\$2. The catch is that the rifero sells only between 30% and 60% of his numbers each week.

Riferos sell most of their numbers in the beginning of the week on credit, but the numbers must be paid for by the Sunday drawing or they will not be paid off. Riferos note the numbers they sell on a small piece of paper or, if they cannot write, the buyer signs his name next to a number in a small notebook. This notebook and pen, clipped into a shirt pocket, make the male rifero an easily identifiable figure in any Dominican campo.

Riferos, in contrast to the quineros, charge a flat \$.25 per number and may sell half a number for \$.12 or \$.13. They thus undercut much of the business of the national lottery which must offer additional prizes in the form of special number combinations on the quinela which may win a house in one of the government-built lottery subdevelopments (barrios de la Lotería). For this reason, the riferos' operation is illegal and the sellers are subject to arrest and harrassment which means that they must remain on good terms with the local police.²⁶

As with the pulpería owner, the interaction of the rifero with his clients has important social as well as economic

²⁶In Whyte's Street Corner Society a similar numbers game is described in urban Boston. There he describes the gradual absorption of independent numbers men into a syndicate run on a corporate style of organization. In Clear Creek, on the other hand, the small scale remains, though it will be shown that most riferos do work with backers who are store owners or commercial farmers and one rifero works for a wealthy wholesaler in Bonao. In both cases backing is necessary because of the great fluctuations in income from the numbers game and in both cases cooperation from the police is essential (Whyte 1955: 115-146).

functions, which is reflected in the riferos' use of space. The rifero is constantly ambulatory, spending the day going from one house to another along a given route, entering those kitchens where sales have been made in the past. He is offered coffee by the woman of the house and gossip ensues; information about social entanglements and economic fortune is exchanged. The dissemination of information is one of the riferos' social functions. After these preliminaries, the rifero asks what number is to be bought that week and the amount of chances to be taken. This usually sparks a discussion of last week's results, of one's own poverty and ill luck, and then the householders' preferences for that week. Each person plays his or her own number, but women play less, having less access to cash. If a fixed number is played, the rifero simply asks the number of chances to be bought.

While the salesman does sell some chances along the road in chance encounters, the bulk of his trade comes from the route he follows. These routes are not exclusive; each rifero has his own particular pattern but overlap exists and most households buy from at least two or three sellers in any one week.

A rifero's route is set by a number of factors. He sells, first of all, in the households of his kinsmen, his neighbors, his compadres, and his friends; that is, the route follows a network of his personal relations. Thus, all of the 14 riferos sold numbers in at least three of the small valleys which make up the settlement while none crossed into Deep Gorge where few

have connections and where the length of the trip and the lack of cash in that area would make the crossing unprofitable. Nine riferos, however, did sell in Black Stone, four in River, and four in Bonao. A number of chances, roughly equal to the amount sold in Clear Creek, is sold by riferos outside the settlement.

A more important factor in determining the number of series of 100 chances a rifero may sell is the amount of capital backing his sales. The rifero's business is such that his clients must have complete faith that he is able to pay off their winnings. Because there are weeks in which he loses money, the rifero must have someone to back him should he lose a great deal at once or a number of weeks in succession. Of the ten riferos who are backed, seven are backed by store owners, two by large commercial farmers, and one by another rifero. The largest rifero with some twenty series (2,000 numbers) to sell each week is backed by a big wholesaler in Bonao. Backers split profits and losses 50/50 but can be counted on to provide any additional moneys to cover heavy losses.

One in every ten households in Clear Creek is headed by a rifero. This number can be supported because of the tremendous popularity of the lottery. Only a tiny minority of adults, perhaps five or six in the settlement, never buy a ticket, though they are joined each week by a complaining number who do not have the money to play. Though to an outsider the lottery may be denounced as a vice (vicio) it is the focus of continual conversation and interest anywhere in the Republic.

On a survey of 24 households done during January 1975 in a time of year when little money was available, the average household wagered \$2.50 with a low of zero and a high of \$11.35.

Some persons have a fixed number which they play each week; others change according to hunches or dreams. Dream interpretation centers around the identification of individuals who appear in dreams. Once awake, the dreamer tries to find out the number of their cédula (national identity card). The last two digits of the cédula are the critical ones.²⁷ Cédula numbers are freely exchanged; a good rifero knows most of his regular clients' identity numbers and can pass these along as necessary. In addition, license plates, distances, omens, and dates figure in the consideration of possible winners. Diviners advertise their ability to predict a person's lucky number and any native curer (curandero) worth his or her salt will include a number along with the other services provided.

The amount that is won in the lottery, of course, depends upon the number of chances which are bought. It happens from time to time that persons will win several hundred dollars; one neighbor of mine won over \$400 on the Christmas lottery in 1973 with "87." He used this money to pay off his pulpería debt, then about \$150, and bought several head of cattle. At

²⁷When I left the Dominican Republic in February of 1975 immigration agents at the airport wanted to take my cédula from me. I wanted to keep it, both as a momento and to avoid having to purchase a new one should I return. They were unmoved, however, until I pointed out that the last two numbers on the card, 51, formed the number which I played each week in the lottery and they must know that no se puede cambiar su numero (you can't change your number). They immediately returned the card to me.

the same time he held a fiesta to celebrate; as is customary, he gave the rifero 10% of the amount which was won. It is more common to win smaller amounts.

The importance of winning is that it can come in a great block of money. Since each number is only \$.25 and is bought from three or four riferos, the outlay is relatively small. If one plays regularly, one will win, though never win back quite the amount which one loses.²⁸

The importance of the rifero lies in the ability to bulk a large number of small amounts of money into a large sum, which, as was the case with my neighbor, enables him or her to make a major purchase or wipe out, however temporarily, a major debt.

The circulation of money, however, does not act as an income-leveling device, because individuals with much capital do not necessarily play more than those who have less. In fact, the reverse may be true. Of the 24 households mentioned previously there was a small correlation between poverty and propensity to play the lottery. In ranking the respondents according to wealth based upon the size of their llanos holding, it was found that the top 12 respondents controlled 77% of the total amount of llanos owned by the group, while the bottom 12 controlled only 23%. The top half, however, played only 60% of the total spent on the lottery while the bottom half played 40%.

While there may be no redistribution of income from

²⁸ If my own experience is typical, I spent roughly \$35 on the rifa over a year's period and won \$5, but the week "51"

wealthier to poorer, it has been said that the riferos' income is subject to great fluctuation. For example, there may be a week in which a rifera has sold only 30% of her numbers and yet all of the winning numbers are included in that 30%. In that case, for each of her series of 100, she takes in \$7.50 but must pay out \$19.00. On the other hand, she may sell 50% of her numbers and have none of the winning numbers included in that total. In that case, she makes \$12.50 per series. A number of bad weeks in a row, however, may take whatever reserves she may have and, once she defaults on a payment, no one in the settlement would play with her again.

In the long run both the backer and the rifero can make money, though the amount depends upon the general income in the settlement and the number of riferos operating. It has been stated that between 30% and 60% of the winning numbers are sold, a profit of \$9.00 to \$18.00 per week which when split with the backer would bring between \$4.50 and \$9.00 to the rifero.

There are factors which tend to keep the riferos earning toward the bottom of this scale, namely, the relative ease with which competitors can begin selling. Store owners and commercial farmers are willing to stake new entrants because they are able to see some small, if erratic, return on their investment. If riferos begin selling more than 60% of their numbers, others will begin to sell. This was particularly noticeable

came in first position, I was out of the campo and did not purchase my regular numbers. This, of course, is part of the reason I kept playing until I left the country.

during the fall of 1973 after a very successful bean harvest when individuals began to hold raffles on pigs, bolts of cloth, and watches and even small children sold numbers for one and two centavos each. The number of regular riferos at that time increased to more than 20 and some who usually worked outside the valley began to include Clear Creek on their rounds.

Forced to sell as high a percentage of his numbers as possible, the rifero is seldom able to sell much over 50% though this increases around Christmas and at post-harvest times before new riferos can enter the competition. Assuming again that winnings in the long run are equally proportionate to earnings and that he has a backer to pay, this means an annual income of roughly \$300. It is the unevenness of the income flow, however, which is the major drawback. The day laborer, at least, is assured of a meal of the prestige staples, whereas the rifero and his household oscillate between feast and famine.

Government Workers

In contrast to the riferos and the pulpería owners, as well as to the farmers in the settlement, there are five individuals in Clear Creek who receive monthly checks from the government for services: two forestry agents, two teachers, and one alcalde (sheriff). Despite their official connections, the alcalde and the forestry agents exercise little political power in the settlement while the large farmers are, in fact, the main force. The large farmers are referred to as the heads (las

cabezas) of the settlement and it has been shown that they develop far ranging ties between themselves and small farmers as well as daylaborers. The alcalde is himself a swidden farmer who, living close by Deep Gorge, spends much of his official time mediating between livestock owners and other swidden growers whose fields are violated.

The appointment of such an alcalde appears to be a conscious effort to diffuse political strength in the campo. The previous alcalde, a man who subsequently migrated to the United States, had been a supporter of the Reformista party when an opposing party won the local election in Constanza and he was ousted. Then the present one was picked.

Like the forestry agents, the school teachers received their present positions through patronage connections in Constanza. The monthly salaries of the teachers, \$90 per month, are triple that of any of the other officials, including the alcalde. However, whereas the forestry agents do little other than accept their checks, the teachers are in their school from 8:30 to 5:00 each day, charged with formally educating some 80-90 students of whom about 65% attend regularly. As pointed out in Chapter one, most of these students, especially after the consolidation of the schools, are children of commercial farmers. It has also been mentioned that the school channels children out of the settlement into urban situations. The teachers feel that migration out of Clear Creek is a good idea since they are quite prejudiced against the rural settlement as a backward and unenlightened place, in spite of its agricultural development.

Migrants

The migrant, like pulpería owners, government employees, and riferos, also plays an important part in the increasingly monetized economy of Clear Creek. Pulpería owners and riferos as demonstrated above are of prime importance in the local circulation of goods and money; riferos link households to one another and pulperías link households to the national economy. The migrant, in turn, links the local settlement to both the national and world economy by sending remittances and returning periodically with gifts from urban centers. These gifts enter into traditional reciprocal spheres of exchange.

Immigration as well as emigration plays a continuing role in the settlement. As indicated in Chapter two, migrants from other places were the original settlers of Clear Creek, and even now migrants continue to come to look for new forest in Deep Gorge. During my stay, two households were set up there by persons from the outside; one was a family which had been displaced by hydroelectric development near Santiago (Gonzales 1972).

The pattern of such immigration is strongly influenced by ties of kinship and reciprocity. Over the past seven years, a narrow valley near Deep Gorge has been filled with some five households who were given land by the alcalde who lives there and claims much of the surrounding mountainside. His son-in-law from Jaravacoa settled there and he, in turn, brought his brothers and aging parents. Three other families, cousins to a close neighbor, also moved in. Though the land was supposedly sold to these households, only a tiny share of the price has

been paid. The alcalde organizes juntas (work parties) several times a year in which the adult males of these households participate; he does not reciprocate. It is his relation to them as landgiver, rather than as political office holder, which entitles him to such help. The main movement of migrants, however, is out of Clear Creek into urban centers.

The pattern of emigration also is influenced by ties of kinship and reciprocity although the initial urge to migrate is motivated by the desire for cash income. Furthermore, after migrating, the worker tends to maintain strong ties with the settlement. Often the migrant's choice of destination and job is sharply influenced by information gained through personal and kinship networks. During my stay, some 40 individuals left the settlement singly to look for work or to engage in employment for periods of more than one month. These were predominantly unmarried males, but females also went primarily to work as domestic help in the homes of relatives or friends. Ten households, in addition to the 40 individuals, also left the settlement, most of them after floods hit the settlement in August-September, 1974.

Males almost invariably work as unskilled daylaborers in a variety of tasks; those who go to Constanza work on the large capitalist farms, but the rest unload trucks, help at construction sites, work in pulperías, sell lottery tickets, or become street vendors. Very few of these individuals bring back any regular remittances, though they are expected to bring gifts, often consisting of clothing or sacks of rice and sugar.

Many residents of Clear Creek talk of their desire to make money in the urban setting. Those who do migrate often hope to get work at the huge mine of Falconbridge, a Canadian firm, located on the outskirts of Bonao, where the lowest paid worker is paid triple the salary of a Clear Creek peón. On very clear nights, the furnaces of the smelters light up the sky to the south of the settlement; in a straight line the mine is only some 20 miles distant. This display of power reinforces the hopes of those who talk of working at the mine. Without connections, however, few succeed in getting work at the mine and no one from Clear Creek ever has.

While residents converse about the economic advantages of migration, they also value the attractions and services offered by the city. The cities are centers for significant institutions: schools, hospitals, and movies while electricity, running water, and general movimiento (action) are all viewed as important benefits. They have strong feelings that life is easier in the city.

At the same time, residents view cities with some ambivalence. They are dangerous places, dirty and hot in contrast to Clear Creek which is cool and tranquil. Farmers who sell produce in the city return with tales of the tigres (cheats) whom one cannot trust. On the other hand, everyone in the campo is said to be bound by ties of kinship and sentiment and therefore is considered trustworthy.

When migration does not involve the removal of a whole household which often means the dismantling of the house and

its reassembly on an urban lot, it is a gradual process. For only about 25% of the 40 individuals who left singly, not as households in 1974, was it their first time to work away from the settlement. For some, their return had become just a visit; their loyalties were already shifted away from the campo. This process begins when multiple ties are established in the urban setting so that activities of a social nature are carried out, including the creation of conjugal alliances, as well as economic ones, that is, wage earning alliances.

Migrants who return to Clear Creek after some time attempt to emphasize their new sophistication. If they have only come for a visit, they wear their best clothes, abstain from agricultural work, and converse at length about their city's advantages. Furthermore, they bring gifts of clothing and toys to the household members where they visit. But, as the day for their return draws near, they make it known that they are in need of sacks of viveres which they can take back--since such produce costs dearly in the pulperias of the capital and the other cities. Residents note these requests for yuca and sweet potatoes with some amusement, but if the visitor has been generous with small gifts, then the request is not denied. In addition, when visits are made by residents of Clear Creek to the city, such gifts of viveres are always taken.

Females are often of great importance in what might be called a kinship chain migration, since through marriage a woman may obtain the benefits of migration for herself while bridging the rural-urban gap for her whole family. Three

migrants to New York from Clear Creek have been women who have used the opportunity to bring their families with them. One married a man from Bonao who subsequently migrated to Brooklyn. He was able to call for her, and she, in turn, was able to bring her father, Javier, there as well. Later he was able to arrange for his wife and the rest of his children to join them. This type of chain migration is commonly practiced by Dominican migrants to the United States. Today there are eight members of this family and one member from each of two other Clear Creek households in New York.

Javier, the father of this family in Brooklyn, has the largest house in the settlement, which sits alone on some three hectares of bottomland, all devoted to pasture. It has its own electricity generated by a small gasoline engine and even contains a television. It is occupied for about four weeks each year when Javier returns with his wife or daughter, either at Christmas or in the summer. His last visit was in August, 1974, when he came down to check on his cattle after his New York unemployment compensation had run out. He formerly served as alcalde but was ousted because of his party affiliation. Nevertheless, he remains one of the leaders of the settlement and was the only one, for example, who was able to organize a junta (work party) to work on the road which was in a bad state of repair.

Thus, in contrast to the present alcalde who only calls juntas to benefit his own personal swidden activities, Javier

is able to organize persons for projects involving the well being of the whole settlement. Since he lives in New York, he is removed from many of the local disputes and therefore he is able to maintain a posture of neutrality. At the same time, he maintains good relations with his widespread kinsmen and friends by bringing generous gifts when he returns. For example, on each visit, he arrives with about \$500 US in cash, clothing, watches and other goods which he distributes to relatives and those persons who look after his animals and property. His generosity is well known and his family, friends, and acquaintances often feel free to request items from him on his future visits. In addition, Javier has a fine natural speaking ability which he has used to deal with influential people in Jaravacoa, Constanza, and Santo Domingo to try to obtain benefits for the settlement. For example, he tried to get outside aid in the construction of a new school. He speaks of coming to live in Clear Creek permanently but acknowledges that his children would never return.

Another woman also migrated to New York in the mid 1960's with the sole purpose of making money to invest back in the settlement. Although she already owned a pulpería, with her earnings as a garment worker, she was able to purchase cattle, land, and a pickup truck, thus diversifying her economic activities. Her daughter eventually followed her to New York, leaving behind her own husband and four children.

Migration to New York is, of course, a very small part

of total migration from the settlement. Although migrants to New York, as shown above, are important beyond their numbers, most migration from Clear Creek is primarily to Bonaó, followed by Jaravacoa and Santo Domingo. At the same time, the New York migrant sharply highlights the functions of a migrant vis-a-vis those who remain in the campo. The migrant is, first of all, a funnel for industrial goods and cash and processed foods into the local population. Even after a short trip to Bonaó, for example, the returnee is greeted, after the preliminary salutations, with "Qué me trajó?" (What have you brought me?). The response, if there is nothing, is "Qué me guardó?" (What have you saved for me?). Participation in this reciprocity, especially for those who are away for long periods, is a means whereby migrants maintain good standing in the settlement, while those who remain can obtain highly desired industrial goods and processed foods.

Returned migrants, however, do not merely give gifts, but they purchase resources in Clear Creek such as land, cattle, and houses. The settlement, in short, becomes a place of investment in cases where the migrant is successful in accumulating capital. In Javier's case, his investments have more political overtones than those of the woman who used the benefits of migration to diversify her economic roles. He is interested in maintaining a position as a settlement leader, a role which perhaps compensates for his low status job in a Manhattan lunchroom as a busboy.

Although in most cases migrants are forced to sell land or

cattle to finance the move, particularly where this involves an entire household, migrants ideally prefer to maintain land and homes in the settlement as an alternative should the urban experience not pay off. The rural plot represents donde trabajar (a place to work) which can provide subsistence if all else fails.

Migration, then, represents a system of potential oscillation; the migrant is a person who moves from one environment to another as conditions warrant. Javier, for example, returned to Clear Creek in March, 1975, to do some commercial farming; his son told me on a recent visit I took to Brooklyn that he had gone to get away from the bad air in New York. Thus the migrant uses the two sets of resources to balance one another. Gifts and purchases transfer urban resources to the campo where they are exchanged for its products, whether they are sacks of viveres or political prestige.

Migrants, as much as middlemen, promote a two-way flow between rural and urban areas. Their remittances and gifts come in exchange for ongoing reciprocities. In addition to this, they represent an enlargement of the settlement's resource potential. Others often follow them to their destination, as is the case with the New York migrants who slowly link their kinsmen into the new environment.

The functions of traditional migration into the settlement, including the search for new resources, the supply of the settlement of origin with those resources, the encouragement of kinsmen to join in that same pattern of exploiting

resources, and finally the removal of the household to the new setting are strikingly parallel to the functions of rural-urban migration. The old links are not severed, although over time they fade away, but they always provide the potential exploitation of an alternative environment.

The central point of this discussion is that the migrant, as well as the middleman, the rifero, and the government worker, provides economic links of critical importance to the settlement. The migrant, like the middleman, links urban and rural centers but more through the establishment of reciprocities outside the market economy. Where direct investment by migrants occurs, this leads to a redistribution of funds, at best temporarily, from the urban to rural sectors. Furthermore, the migrant comes to represent an outpost for the settlement in a particular urban setting, an individual who can be followed and joined if his venture is successful.

Summary

This chapter has shown that there are significant economic roles in Clear Creek settlement which link both commercial and swidden producers and their households to one another and to the outside. The introduction of commercial agriculture to the settlement has, owing to the greater amount of cash in circulation, caused these roles to be widely adopted. The pulperia owner links households to goods and foods produced outside of the settlement. The rifero links households in a cash flow which amass small amounts of money into large sums, allowing such debts as are created in the pulperia to be periodically

wiped out. Of the employees' links, the strongest link is forged to the national society by the salaried teachers who encourage students to migrate out of the settlement. Migrants, in turn, link urban areas and Clear Creek through the exchange of gifts and investments.

When linked to commercial farming, the pulperia and the rifa (illegal lottery) serve to diversify the interests of large growers. Many of the pulperia owners are commercial farmers and it has been shown that others serve as backers for riferos. The rifero, in turn, offers an alternative to persons who otherwise would be peons. Government employment on the other hand appears to be purposefully kept from large growers so as to prevent the concentration of political power in the same hands which informally control the power in the settlement.

Some migrants from the settlement have gone to New York where their slum apartments are in marked contrast to the large block houses which they construct in the campo. But the majority of migrants leave the settlement to enter into occasional and lowpaying urban employment which provide the only opportunities for persons lacking in skills and education. As a funnel for goods and information, however, migrants form significant links between Clear Creek and the outside.

CHAPTER SIX

THE PATTERN OF AGRICULTURAL DEVELOPMENT

The effects of agricultural development in Clear Creek can best be understood by analyzing economic roles in light of changes in adaptive strategies. This chapter, therefore, discusses the material already presented on roles and strategies but does so taking into account more recent changes in the local economy. These changes, including increased emigration and abandonment of commercial farming by some small growers, were partially brought about by a high rate of inflation and a disastrous harvest in October and November of 1974. But, while appearing to be short term adjustments, these changes are, in fact, conditioned by long term constraints in the environment, the political system and the economy on the direction of agricultural development in the settlement. This chapter explains what these constraints are and how they encourage the consolidation of land by large farmers and outside interests and the adoption of other economic roles by small farmers who are able to maintain neither commercial nor swidden agriculture. This discussion shows that the benefits of agricultural development accrue to outsiders and a limited number of the residents of the settlement.

This chapter, then, makes explicit the interrelationships among the two adaptive strategies and the new economic roles in Clear Creek, as a part of the analysis of agricultural

development. It is necessary, therefore, to begin by reviewing the major aspects of the strategies and roles in order to proceed with a discussion of the connections among them.

The traditional adaptive strategy, swidden agriculture, was first practiced by a frontier population which exploited what appeared to be an unlimited supply of forest. Swidden farmers converted forest into productive cropland which was planted for only two years in a 12 year cycle, followed by ten years of fallowing. After three such cycles, the clearing was abandoned to rough pasture upon which a few animals grazed. The major part of Clear Creek, as well as surrounding sections, is today in such pasture which is now enclosed for the cattle of large growers (Figure 3). The old system of land tenure, terrenos comuneros, stressed flexible access to new forest which became settled by isolated households. Outside of sun and fire, energy for the conversion of the natural environment into natural resources was supplied by the household. The household formed the mode of production and because it also formed the unit of consumption, the flow of energy in this adaptive strategy was relatively closed. Though related to the outside through the market exchange of some produce for a few metal tools and some staples such as salt, the adaptive strategy was exercised by self-contained households which, except for labor exchange, supplied their own needs. This adaptive strategy became increasingly difficult to follow as virgin forests disappeared.

The new adaptive strategy of commercial farming, in

contrast, allowed those who practiced it to acquire cash and buy consumer goods as well as staple supplies. This type of agriculture which came to be practiced in Clear Creek in the late 1960's was based on the intensive utilization of irrigated fixed fields. Another factor in the adoption of the strategy of commercial farming was change in the land tenure system. The enclosure of large sections of bottomland was encouraged by the government edict which stated that animals, not agricultural fields, had to be fenced. The enclosure was encouraged also by the utilization of barbed wire. As a result, small farmers' access to bottomland and open grazing in the hills was restricted at a time when the population was becoming more concentrated there.

The adaptive strategy of commercial farming, in contrast to that of swidden agriculture, relies heavily on forms of energy which come from industrialized society. As a result, the adoption of the strategy by a significant proportion of the population of Clear Creek created a fundamental change in the relation of the settlement to the outside. Fertilizers, pesticides, irrigation flumes and other tools were all supplied from outside the settlement and could be obtained only by entering deeply into market exchanges before planting could begin. These transactions were based upon credit and cash. Commercial agriculture needed these inputs because it utilized fixed fields and because its produce needed forms of defense and maintenance which were unnecessary in swidden agriculture due to the diversity of fields and crops.

Commercial farmers also relied upon trucks, gasoline, and intermediaries to market their crops whereas swidden farmers formerly merely carried subsistence crops from conuco to the kitchen. The energy flow became more open and dependent upon the outside.

The adoption of the new adaptive strategy brought with it a new division of labor, discussed in chapter four. The mode of production was altered by the utilization of hired labor as a response to the general monetization of the economy, though the degree of reliance upon hired labor varied considerably with the amount and intensity of production. In addition, new economic roles became specialized occupations achieved in their own right apart from the traditional ascriptive household division of labor, based upon sex, age, and marital status. Thus, women who were formerly confined to the sphere of the kitchens, and in swidden farming, to the field, have the opportunity to take on these roles. The widespread adoption of such economic roles has also been encouraged by the monetization of the economy due to commercial farming. Roles, such as pulperia owner, rifero, and migrant, reflect the need for links between the settlement and the outside to facilitate the flow of cash and goods. When these roles are adopted by a commercial farmer, they provide a means whereby his household is able to diversify its energy and capital so that he extracts a small profit at each of the significant transfer points in the flow of cash and goods. Thus, the commercial farmer who is able to

buy a truck can cut his transportation costs by transporting the produce of other commercial growers. If he owns a store, he can also make a small profit on the spendings of the peones whom he pays, while his cattle provide a source of ready cash when needed.

Ramón, for example, is a large commercial farmer who has already been mentioned as an important middleman in connecting small farmers to the supplier in Constanza. He is a fairly successful commercial farmer since he has sufficient land to plant a diversity of crops as well as keep thirty head of cattle. But his middleman roles allow him the advantage of additional profits at various transfer points. He uses his truck to get supplies for his farm as well as his pulpería, located on Clear Creek's main road. He markets his own produce along with that of small farmers at considerable profit to himself. During the planting season he hires as many as 12 peones who buy in his store. As a result, his family has a distinctly superior life style. His wife has a paid domestic helper, the only one in Clear Creek. The family lives in a large and comfortable block house. The oldest of his six children goes to school in River.

In contrast to the advantages obtained by such multiple role playing, the adoption of one such role as a specialized enterprise may leave an individual or household in a constantly marginal economic position. Those individuals who contribute only labor to the playing of the role, since they lack access to land or credit, are most vulnerable. The sharp differences

in economic security between the rifero and his backer, discussed in chapter five demonstrate what a tenuous position such specialization can create. The rifero has to work up to six days weekly to gain an amount equal to that of his backer who supplies the needed capital in case of loss. Most peones and riferos can supplement these activities with some form of subsistence farming, tending house gardens as do most residents, but the alternatives open to them for earning additional cash are limited.

Cucuru, for example, is a rifero who supplements his earnings with subsistence farming. Cucuru has only three-tenths of a hectare of land which he was given by his father when he retired from farming due to failing health. Because he is a rifero and doesn't have time for agricultural work, his two older sons farm for him. (One of them occasionally works as a daylaborer for an uncle and some other farmers.) Cucuru spends five out of seven days on his route through Nuts, Pretty Creek, Goat and Black Stone, trying to sell the 500 chances he has to sell each week. He works on his own and has no backer. Cucuru has a very low income level of approximately \$300 per year and is deeply in debt at Ramón's store.

Between the extremes of the large grower and the rifero or the peón is the middle ground occupied by those farmers who are able to practice small scale commercial farming on holdings which are less than two hectares. Of the 126 households in Clear Creek there are 49 which practice small commer-

cial farming. This 39% of households shows how broadly based agricultural development has been in the settlement. These small commercial farmers are sometimes able to improve their profits by utilizing household labor and forming partnerships with other small growers. They must rely on middlemen like Ramon to provide them with marketing and other services, and reduce their potential earnings.

Niku, for example, is a small commercial farmer who has 1.2 hectare of bottomland on which he plants tomatoes (with beans) in March and beans (followed by corn) in August. Niku relies for much of the necessary labor upon his two older sons, one of whom attends school in River and who helps on the farm on weekends. Niku prefers not to have a peon de la casa, but instead forms a partnership for one other crop during the year with another farmer who has only .4 hectare. Niku donates the land, the other his labor and both of them split the costs and profits. Niku keeps a few cattle on the hillside land which he holds still in association with his brothers though their father died many years before. He buys about \$1.00 worth of numbers each week from Cucuru who is his compadre and buys his supplies and markets produce through Ramon who is not.

By combining household with hired help and by making connections to suppliers and wholesalers through local intermediaries, farmers like Niku have been able to utilize commercial farming technology. The speed of the adoption of the commercial adaptive strategy by many small holders has resulted

from their rapid recognition of the potentials of irrigated production and their ability to make the necessary economic linkages. Connections to the international market, however, have made farmers dependent upon a whole new set of variables. Changes in the market, as well as in the natural environment of Clear Creek, are making it increasingly difficult for farmers to continue small scale operations.

The difficulties of small farmers bring into bold relief the constraints which favor large scale operations. These constraints, environmental, economic, and political in nature, are producing a pattern of development which closely follows that of the Valley of Constanza where the consolidation of holdings by colonists and a few Dominicans has resulted in the relegation of most of the local population to the position of peones or other poorly remunerated economic roles.

The more dramatic of the short term factors affecting agriculture in Clear Creek in 1974 were the heavy rains which caused severe flooding in August and September and which destroyed most of the fall bean harvest. Whereas in the fall of 1973 over 700 quintales were harvested, there were only 100 quintales in the following year. Though floods had occurred earlier in the valley's history, none had risen as high nor caused as much damage.

Both commercial and swidden farmers recognize that a major factor in the severity of the floods was the removal of forest by slash and burn methods in the past few years in the Clear Creek watershed, particularly in steep gulleys

which border the valley bottom. Residents realize that the cutting down of forest causes severe runoff in the hills during the intense rains to which the region is subjected. But although the swidden farmers watched their own harvests wash down the slopes of their conucos, this had happened before and they suspected it would happen again.

After the flood waters receded, only one holding took preventive measures for possible floods in the future. The owners of the flower-growing enterprise in Goat which had lost several thousand pesos worth of flowers and plants had a stout three foot wall built parallel to the creek to partly hold back rising water in times to come.

The floods occurred in Clear Creek at a time when the farmers were being subjected to inflationary pressures both in terms of the supplies which they had to buy and the food which they bought. Between January 1974 and February 1975, the cost of food in the local pulperías had increased by 22.5%, taking an average of twenty items most frequently sold. Rice rose 25%, sugar 55%, and cooking oil 100%. During the same period the price of a hundred pound sack of fertilizer went from \$6.25 to \$14.00 and the price of pesticides and insecticides also more than doubled.

Many of these increases stem from abrupt changes in the international market which saw the spectacular price rise in petroleum as well as in other commodities which were in short supply due to drought and crop failure. While the price of beans rose along with these other commodities,

farmers could not take advantage of the rise because their crops had been destroyed. Prices of other produce had made small profits for farmers during the first season of the year, but these had already been spent by the fall of 1974.

Not only were the prices for agrochemicals high, supplies were difficult to locate. Farmers who were used to buying on credit had particular difficulty in locating supplies. To obtain fertilizer for the bean crop (which was subsequently destroyed), for example, small farmers had to have their names put on a list in the supply store in Constanza and the orders were filled only as shipments were received.

The combination of inflation and floods was felt sharply throughout the fall of 1974 and into the new year and all households were affected. A sign of the times was that the fiestas normally given by large growers and pulpería owners began a full ten days later than they had the previous year. One of the pulpería owners in Clear Creek with a truck had bought a large order of fertilizer and supplies for resale to small farmers before the floods in August and September. Because she bought on credit, she defaulted on more than \$3,000 worth of debts and was forced to sell her pickup. Ramon, the large grower, sold a number of cattle to pay off his own debts, and, then, using his truck was able to find a cheaper supplier in Jaravacoa than in Constanza. This supplier did not have enough supplies for the small growers whom Ramón usually brought to Constanza. Cucucu, the rifero, sold fewer numbers at the same price while his son went to

Constanza to look for full time work as a peón. Niku, the small commercial farmer, had, by February of 1975, planted a small seedbed for tomatoes but still had not obtained credit to buy the needed agrochemicals nor did he know of where he could get them. So, he was thinking of trying to plant corn from seed left over from the previous year.

In February 1974, only 50% of the small farmers who had planted commercial crops the previous year had been able to find credit and supplies for the new season then beginning. Some farmers, like Niku, planned to continue farming on a more subsistence basis while others were leaving the settlement entirely. Between November of 1974 and February of 1975 some eight households moved out of Clear Creek, one to Jara-vacoa, one to Santo Domingo, and six to Bonao. In addition, some fifteen single males, like Cucuru's son, left to look for casual labor elsewhere. Unlike these workers, however, the removal of households represented a permanent move, since single males often oscillate between urban and rural employment.

These households represented 6.5% of the total population of the campo at the time of their removal. No one in the settlement could ever remember such a large number leaving at once. All but one had been engaged in small commercial production for which they did not have credit to continue in the coming year. While a few of the members of these households talked about returning eventually to Clear Creek, most made the move final by taking down their houses, loading the walls and wooden supports onto rental trucks, and transporting

them to their new homes. One such household was that of Niku's brother, his sister-in-law, and their nine children, all under 13 years old. "Well," said Niku's wife to me watching them tear down their house, "God forgive me for saying it, but I am not sorry. Now there is more for us who remain."

It has been shown that Bonaó has long been the main city for rural-urban movement from Clear Creek so this pattern of migration is, of course, not a new one. Though these emigrants did not initially sell their holdings, they were expected to do so within a year or two. It has been shown that the selling of land rights and the giving up of inheritance to those who remain has also long been part of the pattern whereby some of the pressure on the land is alleviated. What is new, however, is while the land is being abandoned by such households, other holdings are being bought or consolidated by large local farmers like Ramón or by outside interests. In 1974 rights to nearly twelve hectares of bottomland were purchased either by outside firms or by flower firms in Santo Domingo; the average price was \$800 per hectare. In most instances, the previous owner had already emigrated, while in others the money was taken and used toward the purchase of land or a small pulpería in the urban setting. In one case an outside florist firm hired the farmer as a salaried manager of the operation.

For those farmers who were leaving, a return to subsistence or swidden agriculture was neither feasible nor

desirable. Involvement in the cash economy had led them to consider themselves as modern farmers to whom swidden agriculture was a brutish and unrewarding (in monetary terms) strategy. At the same time, a return to swidden farming was becoming an increasingly undesirable alternative compared to entering a whole new urban environment. The urban area, with its schools, offices, factories and its electricity and movimiento offers a whole new set of resources available for exploitation.

The fact that alternatives to large scale commercial agriculture in Clear Creek are being eliminated may be seen as a result of the operation of long term constraints which are operating in the settlement. These environmental, socio-economic and political constraints are considered in turn to show some wider implications about the effect of agricultural development upon the local population.

Environmental conditions force a sharp choice between swidden and irrigation farming in Clear Creek. It has been shown in chapter two that the fertile but thin valleys of the settlement make a distinct contrast to the surrounding steep hills. Another strategy employed in the region is that of dryland farming which represents a condensed cycle of a year of cropping followed by one or two years of fallow (Walker 1972). Because these hills are, according to residents, too sheer and too infertile for farming and because valley bottom-land is used for irrigated production, dryland farming is not utilized except for the subsistence house gardens. Else-

where, for example in River, peanuts are grown under these conditions with the direction of a quasi-governmental corporation. But in Clear Creek such a system, which might act as a buffer between the extensive slash and burn strategy and intensive irrigation is not widely employed, though small farmers may turn to it in the future.

The higher level of technology in irrigation agriculture lessens the stringency of the environmental constraints which operate against the swidden and dryland farming. Irrigation provides a technique for avoiding the limitations of a temporary drought and fertilizer overcomes some of the limitations of a depleted soil. Environmental constraints, therefore, limit the utility of the adaptive strategy of swidden agriculture much more than that of irrigated farming.

In earlier chapters, it has been shown that the main environmental constraint in swidden farming is the lack of virgin land. Virgin forest is preferred by farmers who claim that secondary growth makes possible much lower yields. The diversity of crops and clearings utilized by the slash and burn techniques enables a household to compensate for poor soil, erosion, and pests. But the adaptive strength of this diversity is predicated upon the continual clearing of new conucos which has become increasingly difficult owing to the destruction of natural forest in the sección.

Furthermore, the forest which does remain is located at some distance from the majority of households in the settlement. In addition, areas which might otherwise grow

back into secondary forest are cut and burned over to provide for cattle pasture. This factor, of course, reinforces the need for virgin forest. Farmers who practice swidden are located in the upper reaches of Pines or Nuts or Goat where clearings can be made within an hour and a half of the house. For others to choose to practice swidden would require eventually moving into the more remote areas of Blue Mountain and Deep Gorge, repeating the form of the first settlement of Clear Creek itself. There are few households in Clear Creek who would choose to do so,³⁰ though it has been stated that occasionally households from elsewhere do migrate to these areas.

These constraints on the availability of forest mean that swidden farming, in the long term, is of limited duration to commercial agriculture, though it will probably continue to support a progressively smaller proportion of the population for one or two more decades.

As pointed out above, the environmental constraints on commercial agriculture are less severe than those on swidden farming. Flooding is the most harsh constraint, one which is certain to devastate crops in the future unless there is some program of refoestation undertaken on a wide scale basis. In addition, pest buildup, poor drainage, soil

³⁰It should be noted that opposition to such a movement often comes from women and children who fear the isolated and "backward" (atrasado) circumstances of such a life, away from the clusters in which they live and amenities of the pulperia, church and school.

depletion, and pesticide residues are other serious environmental problems which commercial farmers face. However, they are problems which can, to some extent, be dealt with through the application of various technologies.

An example of the ability of commercial farmers to cope with environmental constraints through technology occurred during my stay. Two large farmers learned that soil analyses could be done through their agricultural supplier if they each brought in samples and paid a \$5.00 fee. The samples were sent to a laboratory in Santo Domingo. After doing so, they were told that their soil needed lime and organic matter such as rice husks and chicken manure. Since the growers owned trucks, they could, after taking produce to Santo Domingo, return loaded with these substances which could be bought cheaply in Bona0. This example emphasizes the point that large growers and outside corporations with capital and transportation are able to acquire information and act upon it to overcome limitations which continue to affect small growers. Thus, soil depletion becomes, for them, a lesser environmental constraint, a factor which can be managed and controlled if the proper resources are available.

Economic constraints on agriculture in Clear Creek markedly favor large commercial enterprises. Whereas high caloric returns to swidden agriculture assure it will remain the most efficient system for households to exploit the remaining forest, this strategy will play an increasingly marginal role in the settlement's agriculture because the

woods are almost exhausted. The reason why the small commercial farm will also play a marginal role will now be examined.

The distinctive feature of commercial agriculture has been shown to be its heavy reliance upon outside sources of energy to produce a crop and outside markets to consume it. The commercial farmer, therefore, becomes involved in a web of socio-economic relationships which the large farmer can manipulate and control more easily than the small farmer, through access to credit, land, and labor.

Large growers, as mentioned previously, have easier access to cheap government credit than small growers. This credit often is used for the purchase of land (either urban or rural), cattle, consumer goods, and the paying off of higher interest bearing debts, rather than being used directly in the farming enterprise. In addition, greater contact with informal lenders, wholesalers, suppliers, may result in the large growers receiving lower terms or other fringe benefits.

Because of this access to credit and the larger volume of their sales, large farmers and outsiders are able to buy land more easily when it is for sale. It should be remembered from an earlier discussion that no one in Clear Creek actually "owns" the land, rather it is rights and improvements in land which are sold, the government retaining the legal control. Thus, land sells more cheaply than it would if titles were held. For a small farmer, the \$800 price of a hectare is a huge sum, but it is not for an outsider or large grower.

Until 1974, this consolidation had occurred primarily in terms of the bottomland, but in the last sale made in the settlement before I left, a large tract of hillside pasture, some of it only partly cleared, was sold with the bottomland. Several of the commercial farmers see this as the beginning of a trend in which the hills will be taken over by highly capitalized ranching interests which will be able to put in improved grasses and stock.

They see the influx of cattle interests as a response to government confiscations of large arable holdings devoted to pasture elsewhere in the republic. The government then forms colonies on the former estates and distributes parcels of land to landless urban and rural populations. The former owners of such holdings would be forced to develop other holdings, in areas such as Clear Creek where the hills are officially described as suitable only for pasture or forest. Already some modern ranches, belonging to old and new members of the Dominican upper class and to some foreigners, have been established closer to Constanza and to Bonao.

Large growers, particularly those controlled by outsiders, are able to treat labor as a simple energy input in the production process. By minimizing their involvement with their workers, their costs are kept low. Those farmers who are unable to separate themselves from their workers, as the case with Ramón and his nephew, are liable for greater expense than otherwise.

In addition to labor, there is another distinct advantage

of the outside corporation over even the large commercial farmer. The large growers, in spite of attempts to limit the size of their families and to educate their children to leave the settlement must eventually divide their land among their children, usually, as pointed out above, among the male children who remain in the settlement. In this way they fulfill their role as providers for their offspring. Unfortunately, within a generation, the consolidated holdings must again be divided. But for corporations and firms on the outside, this does not hold true. The land is held intact though the owners may change.

This greater access to credit, land, and labor gives large farmers and especially outside firms the ability to diversify their investments in order to gain better control over the flow of goods and cash through the settlement. Thus we find distinct connections between large holdings and other forms of enterprise. For example, there are 12 holdings in the settlement which have more than two hectares; of these 12, three are holdings whose landrights are held by outsiders. These holdings constitute only 9% of the total holdings, but include 43% of the irrigable land. The owners of these parcels control 75% of the motor vehicles, 80% of the gasoline pumps, and the two largest stores. In addition, they serve as backers for 20% of the rifero numbers in Clear Creek. In marked contrast are the group of smallest holdings, those with .5 hectare or less, which are held by 73 households or 56% of the total number of holdings. These holdings include

only 16% of the irrigable land, and the households have none of the motor vehicles nor gasoline pumps. All of the riferos come from households in this latter category.

In addition to environmental and economic constraints, political factors also favor the emergence of large scale enterprises. The government encourages the abandonment of subsistence activities in favor of the cash sphere. Sometimes governmental actions in this direction are favored by farmers who deliberately choose to abandon subsistence activities in favor of cash-producing ones since they desire cash incomes to purchase consumer goods and staples. Thus, the government's action to build the road in 1967 is viewed as a major boon to the settlement by all of the residents who consider it not only for its economic benefit but for the fact that it has connected them to the rest of the country. But, at the same time, the household's self-sufficiency is often undercut by such actions which increase its reliance upon low-paying but cash producing employment.

Another example of governmental actions favoring large scale firms occurred during the time of Trujillo. Several small mills (trapiches) in Clear Creek which were operated by hand produced a crude form of sugar. When the dictator expanded his own operations in the sugar industry (Crassweller 1966), he imposed a tax on these mills which made it impossible for them to operate since they produced only small amounts for sale. In the same manner, homemade liquor and beer were banned to increase revenues from taxes on manufac-

tured spirits.

Other political constraints which affect the local economic picture include major laws which prohibit slash and burn agriculture and lottery selling. The farmers of Clear Creek do realize the destructiveness of swidden agriculture; the floods gave dramatic proof of that in their own settlement. At the same time, swidden farming continues to exist either in conjunction with commercial farming or as an alternative to it as a means of providing household subsistence to those who are able to exploit the remaining forest. On the local level, therefore, the interests of the individual household are placed above those of the "national interest," especially when the "national interest" is often identified and defined as the personal benefit of office holders. Hence, most residents interpret laws against the cutting of trees as evidence that the government does not want or allow poorer households to work, but prefers them to be idle (haragán) and vagrant (vagabundo).

The effect of such laws is that, combined with environmental constraints, households are increasingly being forced to abandon subsistence-oriented activities while economic factors prohibit them from entering into commercial or other cash-producing agricultural activities. Thus, they are caught between two systems and the only real alternative left is to become unskilled laborers working for cash wages. Thus, they enter the national and international market at the very bottom of the economic ladder. Even here, some of their

activities, being a rifero or making charcoal for sale, are illegal. The total effect of such legislation is to encourage migration of unskilled and uneducated workers to the city where cash may be more easily sought, though not necessarily found.

The cumulative effect of these constraints on agriculture in Clear Creek, therefore, is to promote a form of development which results in the consolidation of the means of production in the hands of a few large growers and outside firms. The process is, however, far from complete, but by early 1975, it was well under way. It, therefore, appears certain that without any significant alteration the small farmers of the settlement will gradually be absorbed into the national economy, not as producers, but as marginal laborers, many of whom will be in urban areas. If the birth rate is not significantly affected by the adoption of birth control methods as discussed earlier, this will mean the growing division of the population into those few who control resources and those who sell their labor as one of the resources. Rural depopulation would not be a likely result.

It appears, therefore, that those who receive the benefits of development are those who are able to control the sources and exchange of goods, energy, and cash. This group includes a tiny minority of the total population of Clear Creek as well as some absentee owners in the city. The rewards to this segment are perhaps symbolized by the expensive plastic flowers which are kept dusted in the modern rural

homes of the large growers of Clear Creek, while the absentee owners and their middle class clients enjoy even more expensive fresh gladiolas and roses grown in the settlement.

CHAPTER SEVEN

ALTERNATIVE PATTERNS OF DEVELOPMENT

One result of agricultural development in Clear Creek is the growing concentration of the means of production in the hands of a few large growers and outside firms. This pattern is already evident in the Valley of Constanza where foreign colonists and a few Dominican growers control almost all of the arable land (Walker 1972). Nevertheless, there are alternatives to the growing economic inequality in Clear Creek which would more evenly distribute the benefits and the costs of development. This short chapter outlines some of these alternatives.

Any development plan for an area like Clear Creek must provide for more intensive utilization of the hills. Small scale ranching schemes are being tried out under government auspices in similar ecological zones closer to the Haitian frontier. These schemes involve the distribution of small parcels of fenced pasture and improved beef livestock to farmers who utilize them in connection with dryland farming operations. While there have been problems with these programs, in terms of poor coordination and failure to provide farmers with necessary information, the concept appears to be feasible and could be tried on hillsides near the settlement if compensation were paid to those who own the

land rights.³¹

In other areas, reforestation programs could be a long term means of providing a livelihood to a portion of the population. Fast growing types of trees, for example varieties of pine or eucalyptus, could provide opportunities for selective cutting as well as prevent the erosion and heavy runoff which threatens development schemes elsewhere in the Cibao region of the Dominican Republic (Antonini et. al. 1975). Such programs for reforestation could provide an alternative means of employment for swidden farmers who, due to environmental and political constraints, find it difficult to continue their strategy. It may be possible, in fact, to integrate swidden farming and reforestation projects but experiments along these lines, in the Congo and elsewhere, have not been successful (Ruthenberg 1971: 48-52).

In the bottomland, however, the major alternative to the trend toward consolidation of holdings lies in making small farm enterprises viable enough to support the basic needs of a household. The first focus for providing such an alternative involves the necessity to decrease the reliance upon outside energy sources for the growing of cash crops.

It has been shown in this study that commercial farming

³¹In one such scheme, the government leveled nearly 50 hectares of virgin forest on a mountainside to plant grass for the ranches. The forest was cut and burned, but no one from the nearby settlement was allowed to take any wood, not even for cooking fires, since cutting trees for such purposes is strictly illegal.

is a far more inefficient system than swidden agriculture in terms of the production of calories. Much of this inefficiency results from the almost total reliance upon expensive agrochemicals to maintain plants which are highly susceptible to insects and disease. There are other practices, however, which could encourage such maintenance, including a diverse plant population, crop rotation, green manuring, fallowing, and the building up of soil organic matter through composting. But most farmers have limited access to information about such methods, though in many instances a transfer of such practices from swidden farming is possible.

A second focus necessary for making small farming viable, however, is the need of small commercial farmers to form an organization which will enable them to better control their economic links to the outside. A marketing and purchasing cooperative, with a store and a truck would enable them to cut the interest and transport payments to middlemen which they now must make. A cooperative would also be a means for funneling information into the campo upon which production decisions could be made.

Such a cooperative, however, would be the end result of a struggle to form an active mechanism for common action among the small commercial farmers. The formation of such a mechanism would be particularly difficult since it is the household which traditionally forms the decision-making unit. Outside of the cluster form of residential patterning, there are few interhousehold links other than those which tie small

farmers to large growers. One of the few associations which could provide the foundation for a growers' cooperative already exists in the form of a burial society organized by the priest. The society includes about sixty households in Clear Creek as well as many in Black Stone. Payment of \$1 for an adult member or \$.50 for a child is collected from each member of the society when a death occurs to defray funeral expenses. As the Church is extremely active in the cooperative movement in the Dominican Republic, the sponsorship of a growers' association by the Church is a possibility, especially since the new church-school building is nearly complete, providing a meeting place.

But, without the active pursuit of such alternatives, agricultural development, benefiting only a few, will continue to take place in the settlement. In contrast with these few, the majority of households will have to seek the marginal economic return of wage labor, lottery selling, and subsistence farming. Migration from the settlement will continue as the relative numbers of perceived opportunities in the urban setting outweigh the advantages of rural poverty. For the majority of Clear Creek's residents, then, agricultural development will remain an unfulfilled promise.

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BIOGRAPHICAL SKETCH

Robert Wendell Werge was born in Weehawken, New Jersey on November 4, 1944, the son of Thomas Grotvik Werge and Elna Johnson Werge. He spent his early life in Hudson County, New Jersey, graduating from North Bergen High School in 1962. After attending Wagner College in New York City for one year, he entered Hope College in Holland, Michigan. He graduated with a B. A. in history in 1966 and obtained an M. A. in the same field from the University of Michigan the following year. During this period, he attended a summer session of the University of Oslo in Norway.

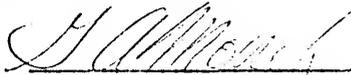
In June 1967, he entered a Peace Corps training program for Nigeria and in the fall of that year was sent to Ethiopia. Until the summer of 1969, he lived in the small town of Dembi Dolo near the Sudanese border where he taught social studies in a secondary school and was in charge of the agricultural club.

In September 1969, he began to study agriculture and anthropology at Oregon State University in Corvallis, transferring to the University of Florida in Gainesville the next year. Under an assistantship from the Center for Tropical Agriculture, he continued his studies in anthropology and carried out fieldwork in rural North Florida and in the Dominican Republic. For two years beginning in June 1973, he

received a Foreign Area Fellowship from the Social Science Research Council to conduct research on agricultural development in the Dominican Republic.

Effective October 1, 1975, Robert Werge is employed as an applied anthropologist by the Rockefeller Foundation at the International Potato Center in Lima, Peru.

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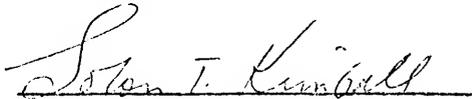
Dr. G. Alexander Moore, Jr.
Chairman
Associate Professor of Anthropology

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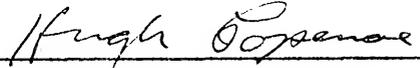
Dr. William E. Carter
Professor of Anthropology and
Director for the Center of Latin
American Studies

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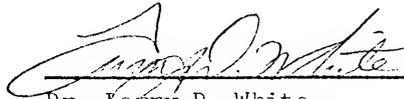
Dr. Solon T. Kimball
Graduate Research Professor of
Anthropology

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Dr. Hugh L. Popenoe
Professor of Soils, Botany,
Geography and Agronomy
Director for the Center of
Tropical Agriculture

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Dr. Larry D. White
Assistant Professor in the School
of Forest Resources and
Conservation

This dissertation was submitted to the Graduate Faculty of the Department of Anthropology in the College of Arts and Sciences and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August, 1975

Dean, Graduate School



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