This is to certify that the

thesis entitled

Tourism and Agriculture on the
North Coast of the Dominican Republic

presented by

Andrea M. O'Ferrall

has been accepted towards fulfillment
of the requirements for

Masters degree in Geography

Robert N. Thomas
Major professor

Date 1-10-90

Tourism and Agriculture on the North Coast of the Dominican Republic

by

Andréa M. O'Ferrall

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Geography
1989

ABSTRACT

Tourism and Agriculture on the North Coast of the Dominican Republic

by

Andréa M. O'Ferrall

The growth of tourism has affected other sectors of the economy both supplying goods to the industry and competing for resources. This can be seen in three basic ways: 1) attraction of labor out of agriculture; 2) inflation of land values and land use changes; 3) creation of incentives for local producers to expand and diversify production. This study focuses on the role of agriculture as both a supplier of goods to tourism and in competition with tourism for the resources of land and labor.

It was expected that due to constraints such as unsuitable soils and climate and lack of knowledge or funds, local subsistence farmers would not be strongly affected by tourism demand. Instead, the relatively fixed supply of foodstuffs would be re-distributed, with hotels having the greater buying power. Larger hotels in Puerto Plata were found to have different buying patterns than the smaller hotels of Sosúa. Land value and land use changes were studied in the municipality of Sosúa. There, land once zoned agricultural in sugar cane and cattle production has been zoned for tourism. Cattle farmers in the area are finding difficulty in hiring and keeping labor. Interviews with local workers indicate that tourism is not strongly attracting rural agricultural labor

ACKNOWLEDGEMENTS

I am pleased to thank my parents who have always been supportive of my endeavors and are curious to read what I have done. My sincere thanks go to my advisor Dr. Robert N. Thomas. Despite many disagreements, he did his best to lead me in the right direction. I would also like to thank Dr. Bruce Pigozzi, Dr. Daniel Jacobson, and Dr. David Campbell for their words of encouragement, Dr. Judy Olson, Dr. Richard Groop, and Ellen White for their instruction during my "cartography year," and all my professors at MSU who helped me understand what it is to be an academic.

My thanks to Rafael E. Yunen, Vice Rector of the Universidad, Católica, Madre y Maestra and Pedro Juan del Rosario of the Economics department. Both were hospitable and helpful sources of information.

Finally, I would like to thank Mark "Poindexter" Kumler who introduced me to the Macintosh and all my office mates in "the zoo" especially Willy "the thinker" Blewett, Adam "the saint" Burnett and Joan "company in misery" Kendall.

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CHAPTER 1
INTRODUCTION

Tourism and Economic Development

Tourism has become an important part of the Caribbean economy, welcomed and expanding since WWII (Figure 1). Initially, tourism was seen as a panacea for economic ills; its proponents argued that tourism provides increased employment, increased income, generation of foreign exchange, and diversification of the economy. It was also argued that tourism can serve as an impetus toward the development of infrastructure through its linkages with other sectors of the economy such as agriculture and handicrafts. Tourism can indeed develop these benefits, but the extent to which the benefits of tourism are shared with the local economy depends on the strength of the linkages with other sectors of the economy. This study focuses on the impact of the tourist industry on the agricultural sector both within and servicing the Puerto Plata tourist region in the Dominican Republic. Within the province, tourism has affected land use and labor, primarily in the movement out of agriculture, while increased demand for food from tourism has affected agriculture both within the province and in surrounding areas.

The potential economic gains of tourism have led many countries to turn to tourism as a source of income. As a service industry, tourism can increase employment and incomes. Not only are jobs created in hotels catering to tourists, but also in spin-off industries including tour operators, gift shops, transportation, and restaurants. These industries provide opportunities for guides, drivers, hotel personnel, waiters, managers, and entrepreneurs. If the inputs into tourism are locally supplied, tourism can also diversify the local economic base.

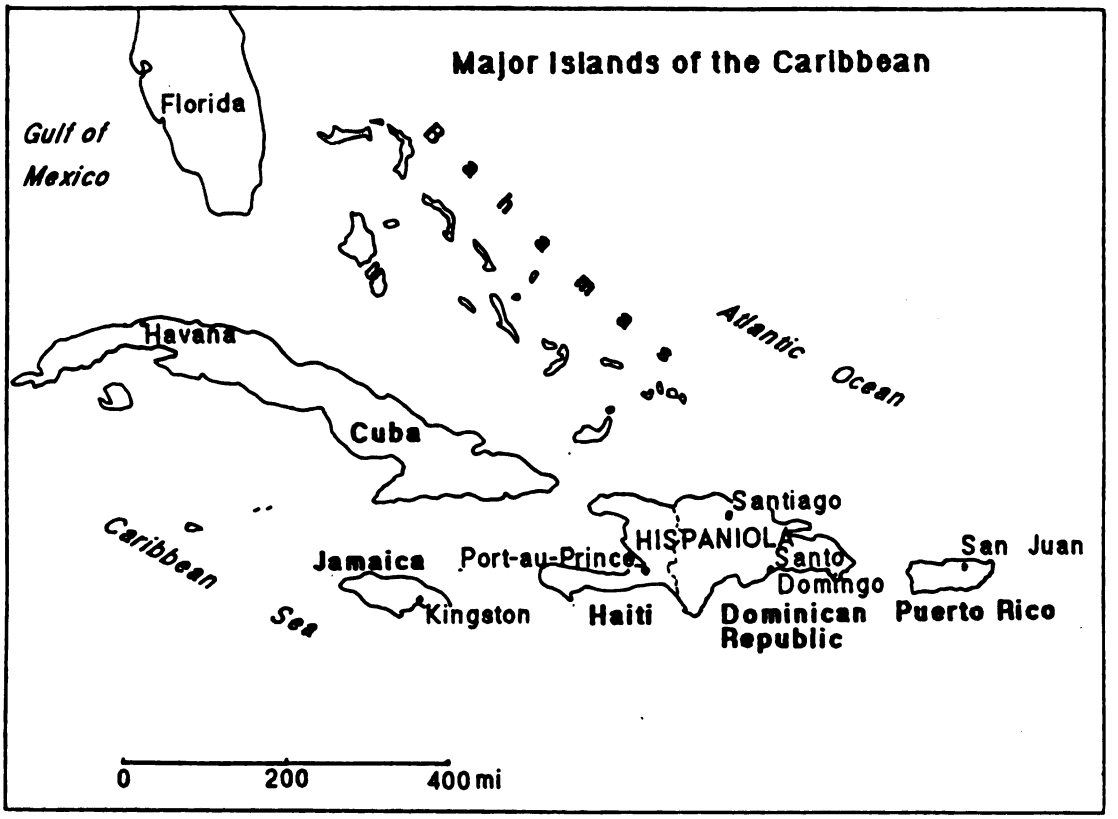

Figure 1 - The Caribbean

The growth of tourism may also be accompanied by a wide range of problems, ranging from water contamination due to inadequate sewage systems to the dispossession and destruction of homes to build luxury hotels. More generally, the "demonstration effect" results as western values and preferences are accepted among native populations. Problems also exist with the idealized economic gains. Many inputs into tourism such as skilled labor, and furnishings at the onset, and foodstuffs during the operation of the hotels, are imported from other nations. Hence, the earnings from tourism are not as great. The tourist multiplier is reduced. To increase the impact of tourism, countries attempt to lessen leakages, one of the largest being through the importation of foodstuffs. This is important since tourist expenditures on food and beverage are usually second only to lodging. A 1977 survey of tourist expenditures in Jamaica found that 34 percent of tourist

expenditures were on food and beverage (Jamaican Ministry of Foreign Affairs, 1978). The potential for leakages is great if the food is imported.

Other economic-related problems attributed to the growth of tourism in the Caribbean include the movement of labor out of agriculture into tourist and tourist related enterprises. This thesis discusses the problem from the viewpoint of migrants to the town of Sosúa, a tourist town in the province of Puerto Plata, as well as farm employers in Sosúa, who are experiencing difficulty in finding labor. Tourism can also affect agricultural land use directly. In some cases tourism growth has affected land availability through the use of productive agricultural land. Rising land prices and land speculation have made it more profitable to move out of agriculture. This effect of tourism on agriculture is also presented in the thesis through the sales of dairy farms within the municipality of Sosúa to the expanding tourist industry.

Tourism can also have a positive effect on agriculture and agriculturally related activities. If foods are supplied locally, tourism will cause an increase in demand for food from the agricultural sector. Also, increases in employment and wages earned by employees can mean increased buying power and local demand for foodstuffs. Increased agricultural employment will be generated in related activities supplying the tourism industry, namely retailers, wholesalers, "middle men," and farmers.

An underlying assumption of this thesis is that tourism's increased demand for food will be reflected in the "related" agricultural activities, the retailers, wholesalers, and middle men, as well as possible increases in production by farmers. That is, while in time production may increase, the first effect of the demand for food by hotels will be a redistribution of what is available. There are several reasons for this assumption. First, the demand for food by tourists is relatively small, perhaps not enough to stimulate the increased investment into agriculture by farmers in the area. Second, the effect on small farmers located within the province would be negligible since the staple crops they produce are not those demanded by the tourism industry. Small farmers on the north coast may not

be financially able to increase or alter production, with climate and soil conditions unsuitable for many fruits and vegetables demanded by the tourist industry. Vegetables are primarily coming from large scale commercial farms in the valley of Constanza, while many fruits, suitable to conditions on the north coast, are abundant. For other agricultural items such as meat and poultry, the country is experiencing shortages. It is evident that with greater buying power, and a need to serve tourists the best foodstuffs available, hotels will be able to outbid residents for the goods they need. There will be a redistribution of goods from residents to tourism, from the second capital of Santiago, to the growing city of Puerto Plata. Finally, while it would be important geographically to determine the effect of tourism on increased production and changes in agricultural land use on the north coast, methods of distribution are so diffused that a direct relationship would be almost impossible to determine. Hence, this thesis focuses on the market place, determining how much local markets have grown and relating this growth to the growth of tourism.

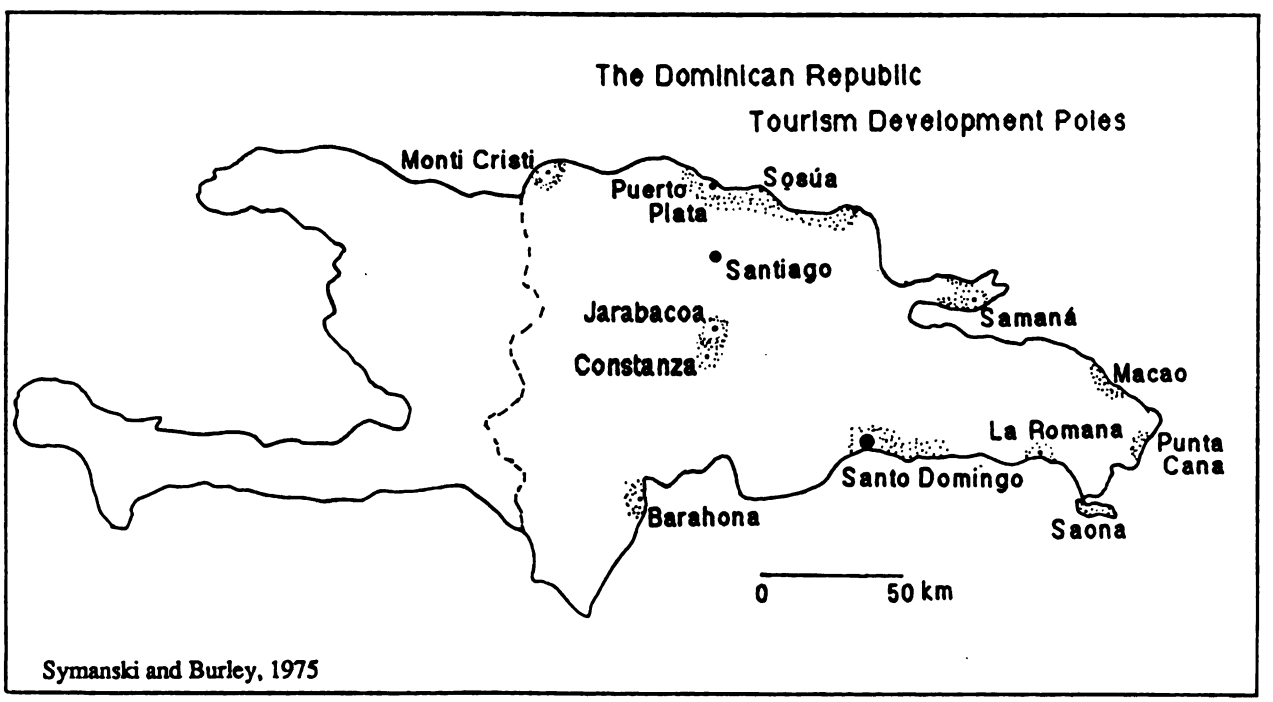

Figure 2 - The Dominican Republic- Tourism Development Poles

Tourism in the Dominican Republic

The extent of tourism's influence on the agricultural sector depends largely upon the size or relative importance of the tourist industry. The Dominican Republic is a relative newcomer to the Caribbean tourism market, and is currently experiencing significant growth (Figure 2). The number of hotel rooms increased from about 8,000 during 1986 to a projected 10,000 by mid-1987 (U. S. Dept. of Commerce, Foreign Economic Trends, 1987). In 1988 there was a record number of hotel openings; the Dominican Republic is now the Caribbean destination with the most hotel rooms (16,406 rooms on the market in 1988 and an estimated 18,758 in 1989). The runner up in number of rooms is Jamaica with 14,031 rooms (Santo Domingo News, Nov 4 -11, 1988).

Tourism grew in economic importance from 26.2% of all foreign exchange earnings in 1982 to 33.3% in 1985. During this period, tourist arrivals increased by 25% (Secretaría de Estado de Turismo, Turismo en Cifras, 1986). These figures demonstrate the significant tourism growth experienced by the country in general and the northeast region especially. Thus, the demand for food by the tourist industry is substantial and continues to grow. While these were the most recent figures available, they do not include the 1986-1988 boom period. The current figures are likely to have increased.

It is expected that the tourism industry will continue to grow, with government incentives for investment in approved tourism projects including a ten-year exemption from income and incorporation taxes, national and municipal taxes, licenses and fees for public spectacles, and import duties for goods not locally available (U. S. Dept. of Commerce, Foreign Economic Trends, 1987).

Tourism Growth on the North Coast

The north coast of the Dominican Republic is comprised of five provinces that border the Atlantic Ocean. From west to east these include Monti Cristi, Puerto Plata, Espaillat, María Trinidad Sanchez, and Samaná (Figure 3).

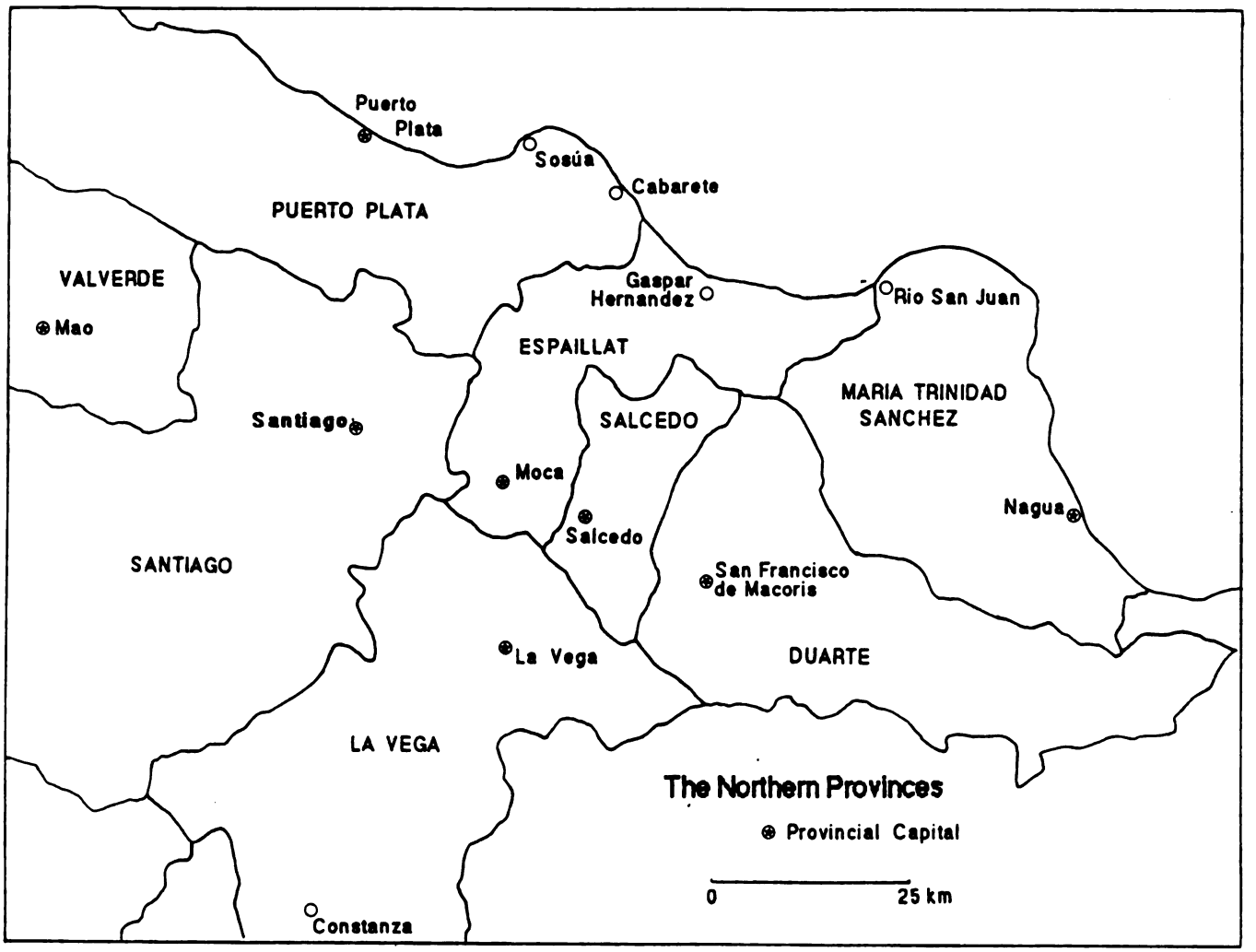

Figure 3 - The North Coast Provinces

A 1981 study of the impact of tourism development on the north coast included the provinces of Puerto Plata, María Trinidad Sanchez and Espaillat (Banco Central, 1981). Of each of these provinces, Puerto Plata has seen the most tourism development. The general extent of tourism development on the north coast runs from the city of Puerto Plata with the Cofresí resort complex directly to its west, to the town of Cabarete, 7 km from the border of the province of Espaillat. Along this stretch of coast, runs "la carretera" or Gregorio Luperón Highway.

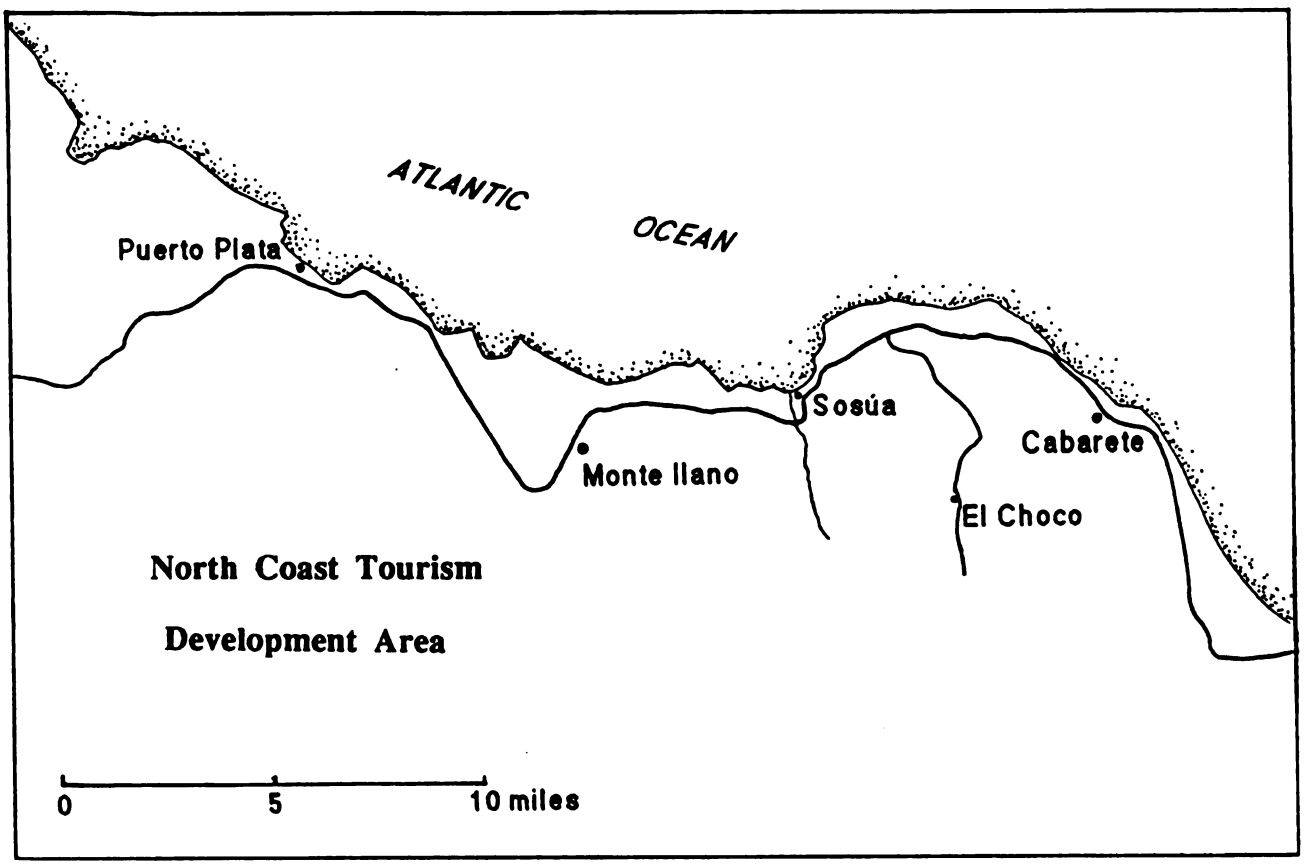

Figure 4 - North Coast Tourism Development Area

Development of tourism in the Dominican Republic began in the early 1970's, with the creation of the department of tourism infrastructure (INFRATUR). This organization, created with the purpose of expanding tourism on the island, selected seven tourist poles for development; the 1) Caribbean Coast (Boca Chica -La Romana), 2) North or Amber coast (Lúperon - Cabrera), 3) Macao - Punta Cana, 4) Jarabacoa - Constanza, 5) Samaná, 6) Barahona (Enriquillo), and 7) Monti Cristi (Symanski and Burley, 1975) (Figure 4). One of the most comprehensive projects was Puerto Plata and the North coast. The project

continues to involve the construction of hotels, support facilities, beach improvement, administration and management programs and a new international airport (INFRATUR, 1988).

While the city of Puerto Plata boasts several hotels, including the hotel Montemar, the first hotel built in Puerto Plata and home of the hotel school of the Universidad Católica Madre y Maestra (UCMM) in Santiago, the largest attraction for tourists is the Playa Dorada complex, 5 kilometers east of the city. The project was begun in 1976 with the construction of infrastructure e.g., streets, electricity, an aqueduct and an 18 hole golf course all set out on 150 hectares or 10,000 square meters of land (INFRATUR, 1988). The growth of the project has been steady with the opening of the first hotel, JACK TAR VILLAGE, in 1979 (Table 1).

Table 1 - Playa Dorada Development Stages

Year	Hotel Complex	Size
1979	Jack Tar Village	240 villas, rooms and suites
1981	Dorado Naco	202 rms
1982	Playa Dorada	336 rms
1983	Villas Doradas	207 rms
1985-6	Village Caraibe	164 rms
1986	Eurotel	402 rms
1987	Heavens	150 rms
1987	Radisson	336 rms
1988	Villas Victoria	120 rms
1989*	Puerto Plata Village	288 rms
1990*	Tropicana Caraibe	
* predicted opening	Flamenco Beach Resort	
	Dorado Naco stage II	
	Centro Commercial - shopping center	
Total Room Supply		2434 rooms

SOURCE: Author's Fieldwork and Puerto Plata News (1988).

East of Playa Dorada along the highway toward the international airport the landscape is one of sugar cane fields, with the center of production located in Monte Llano. INFRATUR has purchased a large portion of these fields with plans to develop another tourism node (INFRATUR, 1988).

The airport, completed in 1978, lies 20 kilometers east of Puerto Plata and is located on 500 tareas (314,500 square meters) of land previously in sugar cane production. Five kilometers to its east lies the town of Sosúa, the second largest city in the province of Puerto Plata. Both east and west of Sosúa lie large private resort complexes.

The town of Sosúa, capital of the municipality of Sosúa, has approximately 11,000 inhabitants (ONA de Estadísticas, 1981). Sosúa contains three major subdivisions, los Charamicos to the west, separated from el Batey to the east by Sosúa beach, and los Cerros to the south. Tourism growth in the municipality of Sosúa has been extensive and rapid (Figure 5).

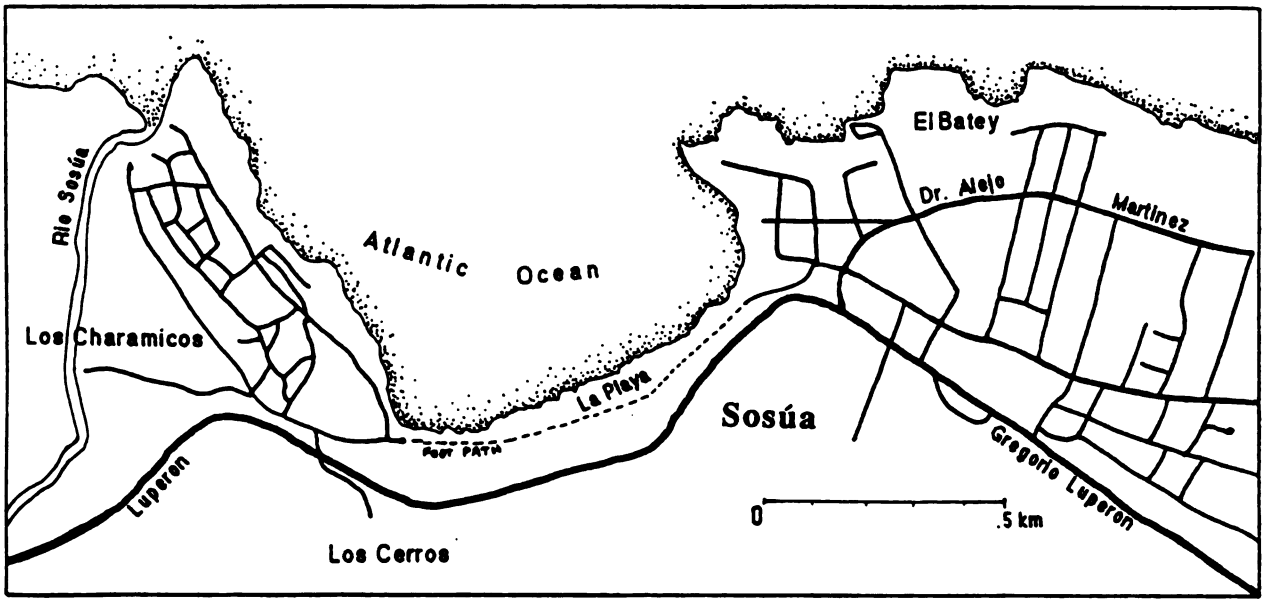

Figure 5 - Sosúa

Development has included resort complexes of a grand scale located just outside the town. Growth has also occurred directly within Sosúa in el Batey with the construction of hotels, restaurants, and condominiums. In los Cerros several hotels have taken advantage of the view from the hillside.

Table 2 - Inventory of Rooms Opening in the Puerto Plata Province (1988)

Location	Name of Hotel	No. of Rooms
Playa Dorada	Jack Tar Village	100
	Village Caraibe	80
	Victorian Resort	106
Puerto Plata	Caracol	14
Sosúa	Arenas Doradas	18
	Brimar	16
	Casa Marina	66
	Colina Sol y Mar	144
	Condos Carolina	26
	Condos Sosúa	15
	Copey Sosúa	53
	El Paraiso	9
	La Carabela	9
	Larimar Beach	131
	Los Coralillos	10
	Mirador	77
	M & M	14
	Ocean Blue	64
	Plaza Del Sol	23
	Sand Castle	240
	Sans Souci	16
	Sir Francis Drake	109
	Sosúa by the Sea	80
	Villas Aida Del M.	34

Source: The Santo Domingo News, November 4 - 11, 1988.

Sosúa has a unique history. El Batey was founded by a group of European Jewish immigrants granted asylum in the early 1940's by the country's then dictator, Trujillo. The settlers' influence on cattle raising and dairy production has been extensive and forms an important part of this thesis. Los Charamicos is essentially home to Dominican residents

and workers in Sosúa. It is said to have been founded by a worker of the United Fruit company who set up a shack on the unoccupied land in the early 1900's.

East of Sosúa toward Cabarete lie large resort complexes in varying stages of development. The town of Cabarete has sprung up along Cabarete beach, a popular hangout for windsurfers, and the site of annual windsurfing competitions that began in 1987.

The Dominican Republic - Environmental Characteristics

The Dominican Republic shares the island of Hispaniola, the second largest in the Antilles (77,914 sq. km.), with the Republic of Haiti. The Dominican Republic occupies roughly the eastern 2/3 of the island (48,442 sq. km.) with 1,575 km of coastline (Hartshorn, 1980). Four major mountain ranges lie in a more or less parallel NW-SE trend. The three intervening valleys, particularly the Cibao, are major agricultural regions. The northernmost Cordillera Septentrional extends parallel to the Atlantic Coast from Monti Cristi to Nagua with small areas of narrow coastal plain squeezed between the hills and the Atlantic ocean. Exposure to northeasterly trade winds for more than half of the year produces abundant orographic rainfall on the northern flank of the Cordillera Septentrional an important coffee producing region (Hartshorn, 1980).

The aforementioned mountain ranges delimit three major valleys -- the Cibao, San Juan, and Enriquillo Basin. Lying between the Cordillera Septentrional and Central extending from Monti Cristi to Samaná, the Cibao actually consists of two valleys: the Santiago Valley (or Western Cibao) drained by the Rio Yaque del Norte and the Vega Real (or Eastern Cibao) drained by the Rio Yuna. A few intermountain valleys occur in the cordillera central: Constanza (30 sq. km.), Jarabacoa (23 sq. km.) and Bonao-Altagracia (128 sq. km.). The higher Constanza and Jarabacoa valleys have also become important tourist and vacation attractions.

Agricultural Development in the Dominican Republic

Agriculture plays a very important part in the Dominican economy. About 50 percent of the population of the Dominican Republic is rural and agricultural; most are small land holders (U.S. Department of State, 1987). Agriculture comprises 19.2 percent of the country's Gross Domestic Product, with the primary products being sugar, coffee, cocoa, tobacco, rice, plantains, beef, and flowers. Recently sugar prices on the world market have been depressed, and the Dominican government has designated the promotion and development of agriculture and livestock, agro-industry, and industrial development as a priority (U.S. Dept of Commerce, Overseas Business Reports, 1980). Tourism has also been designated a priority sector of the economy.

As agriculture becomes a less important part of the gross domestic product as the country develops, the need to improve productivity and provide foodstuffs for a growing population continues. The Dominican Republic's largest and most reputable newspaper, "Listin Diario," publishes daily discussions of food prices, shortages, and the need to give more attention to agricultural development.

The Area Handbook for the Dominican Republic (1973) states that agriculture and the processing of agricultural products dominated economic activity in the Dominican Republic. "During the 1960's agriculture contributed as much as 24 percent to the gross domestic product (GDP) annually, and industrial production, principally sugar processing, accounted for nearly 19 percent of the GDP." In 1986, agriculture comprised 19 percent of GDP - in sugar, coffee, cocoa, tobacco, rice, plantains, beef, and flowers (U.S. Dept of Commerce, Overseas Business Report, 1980). Income in U.S. dollars from tourism rose from $ 26.2 in 1982 to $ 33.3 in 1985, sugar, on the other hand, decreased from $29.5 to $ 16.7 (based on figures supplied by the Secretaría de Turismo, Turismo en Cifras, 1985).

One of the outstanding features of Dominican agriculture is the existence of small scale subsistence farms along with large scale commercial farms. According to data from the 1971 agricultural census, of the country's total land area of almost 12 million acres, over 6.4 million were in farms, and more than one quarter of all farmland, was in the two provinces of La Vega and San Cristobal. In the thirteen northern provinces enumerated in 1970, one percent of the farms accounted for 38 percent of the total farm area. The largest landholder and employer of paid agricultural labor in 1972 was the State at 1.8 million acres. The two largest government agencies are the State Sugar Council (CEA) and the Dominican Agrarian Institute (IAD) (Hartshorn, 1980). Although more recent data are not available, it is likely that these figures have changed given the lessening importance of agriculture in the economy, including the declining importance of sugar (a 57 percent decrease in income from 1982 to 1985), and increased importance of citrus fruit exports.

When looking at the potential demand for foodstuffs by tourism and the capability of local producers to provide food, it must be remembered that small farmers produce mainly staple goods such as plantains, yuca, beans, sweet potatoes, and pigeon peas. As small farmers work to maintain the nation's food supply, there is an ongoing dual trend in land tenure toward fragmentation and concentration -- the former creating ever more fragmentation of subsistence farms, while the latter creates large estates dedicated to export crops.

Many of the vegetables supplied to the north coast, to tourism and residents alike, are grown in the valleys of Jarabacoa, Constanza, and the adjacent Valle de Tireo. These valleys were virgin pine forests until the mid 1930's, when Trujillo, the country's dictator, enacted the Agricultural Colonization law that initiated the development of highways to penetrate the Cordillera Central and established sawmills there. The saw mills, and later colonies of Spaniards, Japanese, and Hungarians were to produce dramatic changes on the landscape of the area in the 1940's and 1950's (Frans Geilfus, Technical Document, 1986).

In the Constanza valley, the new colonies, using intensive techniques and improved drainage, began production on the best land. Here, a new type of commercial agriculture was begun, using a relatively high level of technical knowledge. Today the valleys are equipped with permanent irrigation systems, and the country continues to invest money on irrigation networks. The system has an almost wholly commercial nature characterized by the monocultures of onion, garlic, beans, potato, cabbage, beets, carrots, and string beans, harvests that continue nearly uninterrupted, and a high usage of pesticides (Geilfus - Technical Report, 1986). These characteristics contrast with those of subsistence agriculture found throughout the country -- mixed production of yuca, corn, batata, yautía, and rábano that are rainfed, with little or no use of pesticides.

The Study

This study focuses on the many effects of tourism on agriculture within the Puerto Plata province on the north coast of the Dominican Republic. These effects are evident in the growth of local fruit and vegetable markets in response to the increased tourism demand and population growth in the Puerto Plata tourism node. Also, tourism growth has resulted in the attraction of labor out of agriculture into tourist related jobs and land use changes from cattle farming to tourist resorts. In order to present hypotheses that relate local agriculture and the tourist sector in this area, general theory and empirical research on food production in the Caribbean are discussed in chapter 2.

CHAPTER 2 -
REVIEW OF THE LITERATURE

Tourism and Agricultural Development

Tourism can influence agriculture in four interrelated ways: 1) It can modify agricultural employment by attracting labor out of agriculture; 2) reduce availability of agricultural land through an increase in use of land for recreational purposes ; 3) modify land values and land use in areas surrounding tourism developments; 4) and create incentives for local farmers to expand and diversify their production (Jefferson, n.d.).

Attraction of Labor

The first three ways that tourism may influence agriculture are interrelated and difficult to isolate. In terms of competition for labor, Bryden (1974), concluded that tourism is in direct competition for resources with other sectors of the economy, particularly agriculture, attracting workers from, and to the detriment of agriculture. Jefferson (1972) found that tourism "raises the reserve price of labor" and that some people would rather remain idle than work elsewhere for lower wages -- notably in agriculture. O'Loughlin (1968) observed that in Antigua, "tourism has tended to make the sugar industry even less economic by forcing up wage rates...". Others, such as Marshall (n.d.:17-18), have argued that out-migration from the rural areas started before tourism became an attractive employment alternative.

Land Availability and Value

For many Caribbean nations competition for land is not a widespread problem, since much of the land used by tourist attractions is not valuable agricultural land; Lundberg (1974), noted that as the tourist industry developed in an area, land prices rose sharply. While specific studies concerning the impact of tourism on land values are few, it

is generally accepted that the growth of tourist centers leads to inflated land values, thereby stimulating land speculation.

These generally negative influences of tourism on the agricultural sector in the Caribbean are summed up best by Jefferson (1972):

> While tourism increases the demand for food it may also reduce the supply through its effect on land prices and the availability of the labour force. If food production is adversely affected, the import content of tourism, as well as of domestic consumption, may actually rise as the industry expands.

Expansion and Diversification of Agriculture

The fourth effect of tourism on agriculture concerns the possible expansion and diversification of agriculture to meet tourist food demand. One of the goals of tourism is to provide employment and income for the local economy. This is done directly in the tourist sector and indirectly through jobs created in other sectors, for instance, the agricultural sector. The effect of linkages between tourism and agriculture can best be explained by the tourist multiplier. The direct effects are the most visible, as they result from visitors spending money at tourist enterprises. In addition to the direct impact of tourism on an area, there are also indirect impacts. The indirect or "multiplier" effect is found as tourist spending circulates throughout the economy. For example, second round effects are found as the money paid to the tourist enterprise is spent, such as a hotel receiving tourist dollars and purchasing goods and paying employees. In the third round, the employees spend their salaries. Money continues to circulate until it leaves the economy through leakages. The effect of the importation of food by hotels is to create a major leakage in the second round of circulation, which affects continuing rounds, and therefore substantially lowers the economic gains of tourism. In this study, it was proposed that the proportion of

foodstuffs that are imported would be estimated to determine the extent to which leakages occur, but it was found early on that relatively little is imported in the way of foodstuffs.

Alleyne (1974), studying the potential demand for foodstuffs by the tourism sector in Barbados, found that the high income elasticity of demand of the various categories of food entering into tourist consumption indicated that the potential of tourist demand for food was relatively high. Since items demanded by tourists such as beef, potatoes, fresh fruit, milk, and eggs have high income elasticities, demand for them will grow more rapidly than for other lower income elasticity goods. Even if tourists do not seek local foods, local crop production can be altered to meet their demands.

Reasons for Lack of Linkages

The desire to produce locally the food inputs of the tourist sector makes good economic sense. It will be seen though, that many obstacles lie in the path of achieving the goal of self-sufficiency. The extent to which tourism generates employment in agriculture depends on many factors including natural conditions, such as the amount of arable land, the potential for local production of the types of foodstuffs demanded by hotels, availability and price of imports, efficiency of distribution mechanisms,and overall government policies affecting these matters (de Kadt, 1979, p. 39). The relative size and growth rate of the industry will also affect possible stimulation of agricultural production (Alleyne, 1974).

Bélisle (1983) presents a more detailed list of factors affecting the lack of linkages between agriculture and tourism: a) tourists prefer the type and taste of food consumed in their home countries; b) imported food is cheaper than local food; c) hotels accept an opportunity cost to ensure superior quality and/or regularity of food supply; d) deficient quality of local food (particularly hygienic quality); e) hotel entrepreneurs are not fully aware of the type and quantity of locally available food; f) local farmers do not want to change their traditional crop production; g) farmers cannot increase their production;

h) farmers lack information on the types and quantities of food needed by hotels; i) farmers are inhibited from dealing with hotels or vice-versa; and, j) farmers or intermediaries are unreliable in terms of regularity of supply or fulfilling other contract agreements. These factors reflect underlying problems, such as underdeveloped infrastructure and technology, that help to explain for example the lack of regularity in quality and supply, or why farmers cannot increase production. LeFevre (1977) noted that, "Cases can be cited where food production has in fact fallen with the expansion of the tourist industry, because the industry has opened up more efficient channels of importing" (p. 103).

Tourist Demand

"Foodstuffs demanded by hotels," implicitly states "foodstuffs demanded by tourists." In reference to Bélisle's first factor affecting linkages between tourism and agriculture, it is the general belief that visitors to the Caribbean desire to eat what is familiar to them. As Hills and Lundgren (1974) noted, "At your first meal, a menu, probably designed in Toronto, Chicago or Miami will provide you with a selection of food, imported for the greater part from North America -- good, familiar, homogenized, taste free food, dressed up with a touch of local color." From Lundberg (1974:84) comes the somberly logical conclusion that "the argument in favor of serving locally produced foods makes good economic sense if the produce can be sold; if not, the argument is wasted."

Yet with all the "widely held beliefs" that tourists do not demand local foods, researchers are still uncertain. As far back as the early 1960's, a Department of Commerce study of the tourist industry in the U. S. Virgin Islands suggested that, "Visitor reaction indicates more native dishes and West Indian fruits should be featured on the menu's of hotels and restaurants during the winter tourist season. Especially popular are the papaya, orange, pineapple, and winter avocado" (Creque and Goeggel, 1964).

Since this study found that most foodstuffs are not imported, and that those that are, are either not available locally, such as wines or in short supply such as fish, it appears that the Dominican Republic is not following the trend of other Caribbean nations. As for visitors trying local staples such as yuca or platano, there was little attempt to "sell" these foods. Visitors usually were introduced to them in buffet style settings, and appeared to enjoy them.

Land Characteristics

The possibility of the local agricultural sector providing food for the tourist industry depends on more than just the factor of tourist demand. Physical characteristics of the land such as relief, precipitation, and soil type affect the farmer's ability to increase or alter production. Economic and technological limitations faced by small farmers also inhibit change and expansion. Subsistence farmers may not have the resources to increase production. Inputs such as fertilizer, farm machinery, and pesticides may be out of reach for the small farmer (Belise, 1984 b).

Marketing and Patterns of Supply

Alleyne (1974), focused on future food demands by the tourist sector. He explored the reasons that the agricultural sector was not, and possibly could not, respond to tourist demand, and highlighted a central problem, that of inadequate marketing facilities and systems; "the underdevelopment of marketing facilities compel the producer to incur a high perishability factor in his operations. For one, produce like lettuce and tomatoes must be sold immediately upon harvesting because of the inadequacy of storage facilities and the absence of agro-industry to take up the surplus for canning purposes." These conditions lead to relatively low prices during good harvests, and high import levels of canned foodstuffs. Bélisle (1984 b) also found marketing inadequacies and lack of development of

the food-processing industry to be important constraints, noting that "Many complaints by Jamaican hoteliers relate to unavailability, irregularity of supply, and wide price fluctuations of several local food items." Other geographic studies have focused upon the supply of food to the tourist sector. Lundgren (1973, 1975), described how six Jamaican hotels purchased selected local products, and identified the geographical patterns of supply according to perishability. Despite the small sample size, Lundgren found that two-thirds of the supply of several commodities came from within ten miles. While hotels dealt with farmers, fixed retailers, and "higglers" (itinerant intermediaries), the majority of transactions were conducted with nearby producers, with high frequency but low volume sales.

Hotel Size

Hotel demand for locally supplied goods has been found to be a factor of hotel size. Rodenburg (1980), found that import leakages for the tourist sector in Bali were related to hotel size. Large, industrial tourism exhibited leakages of 35-40 percent while small scale "homestay" tourism facilities exhibited no leakages. The food sector specific findings for Jamaica are similar (Bélisle 1984 b). The proportion of locally supplied food was found to vary from a high proportion in smaller, lower class hotels, to a small proportion in large, high class hotels. This relationship concurs with some of the reasons cited for lack of linkages between the agricultural sector and the tourist industry, generally that farmers are unable to supply sufficient amounts of high quality foodstuffs to meet the demand of larger hotels.

Agriculture on the North Coast

In 1982 the Central Bank published a study titled **Evaluation and Impact of Tourism on the North Coast of the Dominican Republic** (Banco Central,

Evaluación E Impacto del Turismo en la Costa Norte de la República Dominicana, 1982). The study discusses the effect of tourism on agriculture focusing on the three northern provinces of Puerto Plata, María Trinidad Sanchez and Espaillat. The work provides excellent base line data, since at the time there was little or no effect of tourism on agriculture. The following discussion of agriculture on the north coast has been translated from Spanish and summarized from the study (single spaced).

Physical Characteristics

Together the three provinces of Puerto Plata, María Trinidad Sanchez and Espaillat cover 4,165 square kilometers (6.6 million tareas) which is equal to 8.6 percent of the land area in the Dominican Republic.

Soil types vary widely in their morphologic characteristics, uses, and productivity depending on location, from the flat coastal strip to the mountainous area of the Cordillera Septentrional. Soils of inherently medium fertility predominate on the flat coastal land, mainly calcareous and limestone.

Drainage is generally good except for the areas to the east of Puerto Plata. In general, the factors that limit agricultural development in the coastal flatlands are the shallow topsoil, insufficient drainage, and low fertility. In contrast, the mountainous areas are limited by a high rate of erosion, and large variation in soil fertility (partly due to the erosion problem).

The slope north of the Cordillera Septentrional combines good soil conditions and climatological conditions for the cultivation of citrus fruits and avocados in addition to the traditional coffee, cacao, and pasture.

Local Food Production

The study discusses the possible effect of tourism on increasing the demand for foodstuffs and the ability to provide them locally. At that time:

The zone was a net exporter of avocado and citrus. However, due to the dispersion of the products and irregularities in commercialization it was not possible to quantify the exact magnitude of production and exportation.

The study also found that:

The north coast, from Nagua to Luperón is insufficient in the production of staple crops and the only reasonable attempts to produce on the coastal flatlands are mainly plantains which are not very resistant to the diet of rain and poor drainage. However, even the area in plantain cultivation has remained static or has lessened slightly since the zone

has specialized in cattle raising. Also, there doesn't appear to be a large movement toward investing in agriculture among middle and high class landowners and everything seems to indicate that the zone will continue to import supplies from traditional providers.

Moreover, the region is a net importer of vegetables which come from areas in or near Constanza, where they supply large consumers such as hotels and the intermediaries that sell these products locally.

The production of vegetables in the region is faced with enormous difficulties due mainly to the absense of a tradition of horticulture in the zone as well as climatological and soil factors that are difficult but not impossible to resolve.

The study made several conclusions including:

Agricultural diversification had been limited mainly by the small market size, and not so much the lack of experience which could be brought into the region from other places. Furthermore, agricultural production in the area was difficient and would continue to be so until the size of the market on one hand and transportation costs on the other would combine to make it more profitable to produce locally than to import from other provinces.

The first significant thing that has been established in relation to the effect of tourism demand on agricultural production is that the volume of aggregate demand due to turistic consumption has not been and is not sufficiently large to have created a large enough volume of demand that would make local production competitive with respect to the importation [from outside the province] of these agricultural goods.

The hotels and touristic establishments in the zone, while they had increased the demand for agricultural products had not done so at a scale sufficiently large enough to affect production changes due to the following factors:

1) Internal tourism - while high on weekends was very seasonal and unstable with reference to direct effects on local demand of agricultural products. People going to the beach brought their own food.

2) Maritime visitors did not stay long enough to generate a significant demand.

3) Tourists from INFRATUR'S Playa Dorada complex constituted an insufficient population and it was uncertain to what extent their consumption habits would have an effect on agricultural production with exception of vegetables."

Since the writing of this report circumstances have changed. Demand for agricultural products by tourism has grown substantially. It was beyond the scope of this thesis, due to the same factors of "dispersion of the products and irregularities in commercialization" that faced the Central Bank, to quantify the exact magnitude of the volume of production and exportation in the zone. Instead, an investigation of the growth of local markets, their suppliers and the goods they sell was conducted. Results give insight into how tourism growth has affected agricultural demand.

Cattle Industry

The study also discusses the importance of cattle industry in the zone, since historically the North Coast has been known for its cattle raising and milk production:

Long ago the type of cattle dubbed "double purpose" predominated in the region. However, at the beginning of this century two occurences changed substantially this production scheme. On one hand, there was a massive introduction of meat cattle and with that the production of meat and its derivatives gradually became independent especially in the area of the large milk producers. On the other hand, in the early 1940's Jewish immigrant families brought with them from Europe dairy cattle that further made more clear and definite the difference between the two types of cattle farming.

The study found that:

Although the only definite verification can be the result of the publication of the 1981 agricultural census [which never was] that on the North Coast three types of cattle raising prodiminate: meat cattle which is the heritage of the large land owners, dairy cattle made up of large, medium and small producers, and the "double purpose" variety owned by small and medium sized producers and one or another large owners with traditional mentality.

And concludes that:

The region continues to be a large producer of milk, meat and its derivatives at levels that are and will continue to be for a long time considerably greater than any conceivable increment in the demand that could be generated by in increase in the tourist population. In the same fashion the behavior of prices would not be affected by any incease in demand partially due to price controls and partially due to the fact that historically there has been a policy of exportation or not of meat that has fixed the behavior of prices of meat in the market.

What the study did not forsee was the devaluation of the peso, making inputs to cattle raising relatively more expensive and increasing the profitability of selling land to tourist enterprises. The ensuing decrease in the supply of meat and dairy products is due to a variety of factors including the sale of farmland. Dairy farms are becoming vacation complexes, as can be seen particularly within the municipality of Sosúa.

CHAPTER 3
STATEMENT OF PURPOSE

Increased Demand for Food

Tourism has been growing rapidly on the north coast of the Dominican Republic; the effects of its growth on agriculture have been manifold. This thesis focuses in part on the creation of incentives for the expansion and diversification of agricultural enterprises. In earlier research, the growth of tourism, and the demand for food, was seen as an incentive for local producers to alter crop production to meet demand. In this thesis, it was assumed that before farmers are made aware of changes in local demand or are able to introduce changes to meet the new demand, marketing systems will first be affected. That is, a relatively fixed supply of foodstuffs will be channeled to meet the demands of hotels and restaurants which are more able to pay for foods than the local population. Farmers, due to a variety of reasons, such as lack of financial resources or knowledge, unsuitable climactic, terrain, and soil conditions, may be unable to meet the needs of the expanded local market. Expansion of wholesale and retail sales of fruits and vegetables reflect an increase in the local demand, but not necessarily increased local production.

To continue the understanding of tourism's effect on agriculture this study concentrates on the supply of goods to hotels and the growth of local markets. A top down approach was used, first quantifying the amounts of foods demanded by hotels and their supply patterns, then determining the effect of increased tourism on the growth of local markets in Sosúa and Puerto Plata.

Food Supply - General Research Questions and Assumptions.

An increased demand for foodstuffs by tourism will affect the market for agricultural goods. The 1981 Central Bank study on the affects of tourism on the north coast found that tourism had not created a sufficient increase in demand to substantially affect local markets. It was expected that this was no longer the case since tourism had

been growing very rapidly since 1986. The number of tourists visiting the north coast has increased substantially since then. Also, tourism not only causes an increase in tourist mouths to feed, but also an increase in the permanent population of the tourist centers. An increase in size of local food markets would be due not only to the direct demand for goods by tourists but also to the growth of the local population associated with tourism. I expected to find that those goods sold in large quantities in the local market were not necessarily those used by hotels, but by the local population, although it was not possible to test this assumption since the total consumption of different fruits and vegetables cannot be compared.

Through a "food quantity and origin" questionnaire, the amounts used of different fruits, vegetables, meats, and dairy products were determined as well as the marketing systems through which the commodities passed. Bélisle and Rodenberg found that the import content of products used by hotels was a factor of hotel size (Bélisle, 1983; Rodenberg, 1980). Large, industrial tourism demanded levels of quantity, quality, and certainty of supply that indigenous markets and suppliers were unable to fulfill. Although it was originally proposed that hotel demand components, both of foreign and local foods, would be determined through interviews with local hotel and restaurant managers, it was discovered early on that relatively few items such as olives, artificial sweeteners, spices, and wines -- goods not locally available, are imported, and that those involved in food preparation and planning are willing and able (with some complaints) to work with what is available. Also, government restrictions inhibit the importation of goods that are available locally although this is changing, particularly in the case of seafood (see chapter 6).

The question became not one of import versus local supply, but one of local versus non-local supply from within the country. The large hotels in the Playa Dorada complex were compared to the smaller hotels and restaurants in Sosúa to determine the patterns of supply within the country. It was expected that for the larger hotels in Playa Dorada, the tourist multiplier was not experiencing a leakage due to importation of foodstuffs from

outside the country, but from outside the province. The smaller scale restaurants in Sosúa were more dependent on local suppliers.

The relationship of local vs. non-local supply is highly dependent on the type of good being demanded. In order to present hypotheses and findings, foods have been broken into the basic groups of fruits, vegeta meats, fish, and dairy products. Results of the study are presented for Playa Dorada hotels, Sosúa hotels and restaurants, and local vegetable markets in both towns.

Finally, there was some evidence of local agriculture attempting to meet the demand of tourism in the area. Due to climatic conditions suitable for citrus crops, these were most easily supplied by local land owners. An attempt in the early 1980's by one commercial farmer to grow vegetables locally met with failure, since many of the goods coming from Constanza could be purchased more cheaply at the market in Santiago. A discussion of this response to tourism is discussed in the concluding chapter of this paper. Figure 6 illustrates the general flow of vegetables between markets on the north coast and hotels in Sosúa and Playa Dorada.

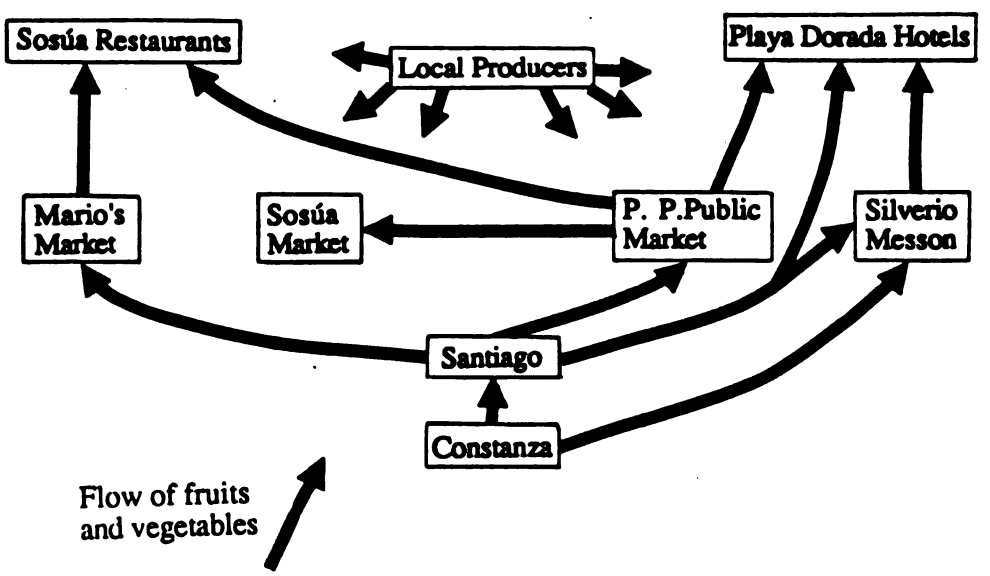

Figure 6 - Supply to Markets and Hotels

Hypotheses for For Playa Dorada and Sosúa Hotels

Since it is important to tourism planners in the government and private sector alike to gauge the affect of tourism on other sectors of the economy, it is of vital interest to determine the origin of tourism inputs. In the case of agricultural inputs the following hypotheses were proposed:

Hypothesis 1a - The supply patterns of fruits and vegetables for Playa Dorada hotels and those in Sosúa are significantly different. Vegetables supplied to Playa Dorada hotels are obtained primarily through the market in Santiago. Fruits and vegetables supplied to restaurants in Sosúa come primarily from the market in Puerto Plata.

Hypothesis 1b - Fruits also come from the Santiago market, with the exception of those that are available locally in large quantities such as oranges, pineapples, watermelon, and avocados.

Rationale - The market in Puerto Plata has not grown sufficiently to meet the tourist demand for vegetables by the large industrial tourism hotels in Playa Dorada. Instead, goods come from Santiago which is a major hub for distribution of vegetables for the northwest. Here buyers can purchase vegetables more cheaply with certainty of quality and supply. The smaller size (smaller quantity of food demanded) of hotels and restaurants in Sosúa makes it more feasible to go to the market in Puerto Plata. Also, they are farther from Santiago than hotels in Playa Dorada. Itinerant vendors of locally grown crops (namely citrus fruits) supply sufficient quantities of high quality fruits due to their abundance in the area.

Hypothesis 2- Supply patterns of fish, chicken, and red meats are significantly different for Sosúa and Playa Dorada establishments. For Playa Dorada, meats, excluding processed meats such as bacon and sausage, come from Santo Domingo. For Sosúa, meats are bought primarily within the Puerto Plata province. Also, the local supply of seafood was not sufficient to meet the demand at Playa Dorada, while Sosúa restaurants used more locally caught fish.

Rationale - Most of the slaughterhouses are located in or near Santo Domingo. Hotels in Playa Dorada buy in advance, in bulk, freeze the meat, and do not fear later shortages. Restaurants in Sosúa, however, often do not have storage facilities and have no need for the large quantities needed by Playa Dorada hotels. Hotels and restaurants in Sosúa will deal more often with itinerant vendors when buying meats and fish than those in Playa Dorada. Again, meat is needed in smaller quantities, and menus are more flexible. Many restaurants in Sosúa do not have freezers and cannot buy ahead of time in bulk.

Hypothesis 3 - The supply pattern of dairy products will not be significantly different for Sosúa and Playa Dorada hotels. Dairy products to supply both locations come almost exclusively from the Puerto Plata Province.

Rationale - The north coast traditionally has been a dairy producer. Of secondary importance, the high perishability would hinder hotels from going to outside sources.

Local Markets

Four fruit and vegetable markets within the province of Puerto Plata were contacted for the study: in Puerto Plata, the public market and a large wholesaler, in Sosúa, a local wholesaler (and retail vendor), and a small tourist retail vendor . The markets in Puerto

Plata were the only two large centers within the city although there were other small local markets. The two markets in Sosúa were the only ones selling fruits and vegetables exclusively. Two supermarkets within Sosúa and small shops in Los Charamicos (the Dominican resident section of Sosúa) also sold vegetables.

Markets and suppliers within the Province were expected to have increased in size and number, have increased frequency of visits to the market hub of Santiago, and begun direct trips to the valley of Constanza for vegetables, since tourism began growing rapidly in 1986. The collection and transportation of fruits and vegetables has created many jobs, although this cannot be quantified. It was also expected that local producers would have incentive to meet the increased demand for food by tourism.

Land Use Changes

Tourism can also have negative effects on agriculture. Those documented in this thesis are straightforward. Primarily, land once zoned agricultural in both sugar and dairy farming has and is being converted into tourist resorts. As tourism growth occurs, land prices tend to rise. Farmland becomes real estate. Examples of the change in land use from agricultural to tourism can be seen throughout the province of Puerto Plata, particularly in the town of Sosúa. In order to investigate the process of competition for land and changes in land use surrounding the town of Sosúa, a case study approach of tourism's effect on the municipality was conducted by tracing the recent history of Productos Sosúa, originally a meat and dairy cooperative founded by Jewish settlers in the early 1940's and now a shareholding company specializing in cheeses and processed meats.

Also, increased attention to tourism growth has helped lessen the nation's dependence on sugar cane production. The growth of tourism has not been a direct cause but a convenient solution to the lessening importance of sugar cane in the nation's economy. Declining world prices for sugar have decreased the profitability of sugar cane

production. The north coast, an important region of sugarcane production looks to tourism as a viable alternative.

Hypothesis 4 - Tourism is a significant factor in the movement of land owners out of cattle raising and dairy farming. The extent of tourism's effect on increasing land values and land sales can be seen surrounding the town of Sosúa.

Rationale - Milk production in the municipality of Sosúa has decreased due to higher production costs and government controlled prices for milk. Tourism, while not the primary cause of the decrease, has made farming an even less profitable endeavor by raising wage rates and making the labor force more unstable. The sale of land has become a more profitable alternative to cattle or milk production.

The Attraction of Labor out of Agriculture

Tourism may also be an influential factor in attracting labor out of agriculture. While the resources (time) were not available to study this effect in depth, this study does however, draw some preliminary conclusions. In the case of the Dominican Republic, it appears that out-migration from rural areas started before tourism became an attractive employment alternative as found by Marshall (n.d. 17-18). Perhaps this is more easily noted because the Dominican Republic has entered the tourism market relatively late. Also, rural population growth has been sufficient to maintain agricultural production. In fact, tourism has been heralded as a solution to north coast rural immigration to Santo Domingo (Jaime Moreno, economic advisor to the ministry of tourism, at Tourism 2000 world tourism forum, Sept 1988), although it is uncertain how these claims can be substantiated.

To determine the effect of tourism on agricultural employment, members of Productos Sosúa were questioned concerning their ability to find and keep labor since 1980. Also, workers in the town of Sosúa were interviewed in order to determine whether

they had come from agricultural backgrounds. Twenty-five workers in various occupations were selected at random, excluding foreigners. (See Appendix I for Questionnaire).

Labor - Hypotheses

Hypothesis 5 - Generally tourism's growth has not been a significant force in rural migration to Sosúa but has attracted those who had previously migrated to other cities.

Rationale - Based upon government sources, the growth of tourism on the north coast has stemmed cityward migration to the large urban centers of Santiago and Santo Domingo. The Dominican Republic is a highly mobile society. Many of those workers who migrated to the town of Sosúa had been involved only minimally with agriculture and had previously migrated from their place of birth to other urban centers.

Hypothesis 6 - The growth of tourism in the province of Puerto Plata has had a significant effect on the ability of cattle farmers in the town of Sosúa to attract and keep permanent employees.

Rationale - In terms of local cattle farming, tourism has affected the ability of local farmers to find and keep labor, and has lead to the increased usage of Haitian labor. Workers can earn higher wages in tourist related jobs such as moped taxi drivers, restaurant employees, and construction workers. Also, government willingness to allow Haitians to enter the country and perform jobs that native Dominicans are unwilling to do, such as working in the sugarcane fields, has gained Haitians access to other jobs particularly in agriculture and construction.

The methods used to obtain and analyze information for the study are presented in the following chapter.

CHAPTER 4
METHODS AND PROCEDURES

Field Research

Field research within the Dominican Republic was conducted from September 15 to December 10, 1988. The goal of the research was to determine the extent to which the tourist and the agricultural sectors are linked, and the different effects tourism's growth has had on the agricultural sector.

Hotel Food Supply

Research began with interviews with hotel and restaurant managers, chefs and food and beverage managers to discuss problems concerning food supply. Contacts at hotels were asked whether the supply of different foods had changed over the past few years, if certain items had become more difficult or easier to obtain, and their prognosis on the future supply of foodstuffs. Local newspapers were consulted daily for information concerning tourism and food supply.

For information involving food consumption and supply of agricultural products, I spoke to food and beverage managers as well as members of the purchasing and accounting departments. Of the nine hotels currently open at the Playa Dorada complex (one opened just before I left), I was able to obtain information from seven.

Hotel food service managers were asked to provide monthly consumption of fruits, vegetables, meats, dairy products and dry goods for one year. An eight page survey was developed for this purpose (Appendix I). When hotel operators balked at such a large task, the request was altered to two months in both the the high and low season, one month in each season or an approximation of each season depending on the willingness of management. With all the questionnaires completed, the figures were averaged to determine a monthly mean consumption.

Table 3 - Detail Level - Responses to Food Consumption Questionnaires

Hotel	Source of Monthly Estimates	
Playa Dorada	1 high season/1 low	
Villas Dorada	weekly estimates high season	
Heavens	monthly estimates high/ low seasons	No list of suppliers
Dorado Naco	1 high season/1 low	
Eurotel	2 high/2 low	
Radisson	2 high/2 low	
V. Caraibe	4 high/3 low	

Source: Author's fieldwork

In addition to the consumption information, a list of suppliers was obtained from all the hotels in the study except Heavens. This list also included whether the supplier came to the hotel or whether the hotel went to the supplier and approximation of the number of visits to (or by) each supplier. For two of the hotels, the percentages of seven different fruits and ten vegetables purchased in the two markets in Puerto Plata, in Santiago, and elsewhere were enumerated. This was done for one month in the high and low seasons. The two hotels serve as an example of the relative importance of the different markets for the purchase of various goods.

Restaurant managers in Sosúa were also interviewed. Since the enterprises in Sosúa were smaller scale and less organized, estimates of consumption were elicited from owner/managers. Eleven restaurants, of varying sizes, were included in the study. This constitutes approximately one-third of the restaurants in the town. A list of suppliers and of the frequency of visits to market were obtained as was for the hotels on Playa Dorada.

After obtaining information concerning food consumption and supply patterns from hotels, I began contacting suppliers to hotels to determine from where they were obtaining their supplies of foods and vegetables, and how the growth of tourism had affected the

growth of their businesses. With one supplier, Silverio Messon, the largest in Puerto Plata, I made what turned out to be a seventeen hour trip to Constanza, driving there, purchasing vegetables and driving back.

Land Use Changes

Concurrent with the interviews of food and beverage managers, I began the interviewing of stockholders of Productos Sosúa (local cattle farmers) to determine the reasons for the drastic decreases in the intake of milk to the company, hypothesizing that land use change to tourism was a major factor. Of the 37 living members, 22 were interviewed (Appendix II). Real estate agents were also contacted. While the real estate business is notoriously secretive, the agents were helpful in corroborating (and refuting) the information given by the Productos Sosúa land owners.

Labor

During the final month of the study, employees ranging from taxi drivers (*moto* taxi drivers use mopeds to transport one to three people around town) and desk clerks, to maids and gardeners were interviewed to determine migration patterns toward the tourist area, and therefore discover whether a rural or urban trend predominated (Appendix III). A 1980 investigation of the migration patterns into the two cities of Santo Domingo and Santiago was used as a basis to compare the results of the survey of employees in Sosúa. Also, the members of Productos Sosúa were questioned about the ability to hire farm laborers and to keep steady workers.

Statistical Analysis

To study tourism's effect on the increase in food demand and marketing systems for Sosúa and Puerto Plata hotels, the chi-square test is used to compare frequencies of

trips to markets for Playa Dorada versus Sosúa hotels. The section on land use change is not statistically analyzed, since there was no base year data available to compare present day conditions. The sample size for the labor and migration section is small, but illustrates sufficiently the dynamics of the area.

The data collected in the three month stay in the D.R. as well as statistical analysis are presented in chapter 5.

CHAPTER 5
DATA ANALYSIS

The primary focus of research conducted on the north coast involved determining how an increased demand for foodstuffs by tourism affects the market for agricultural goods. To this end, supply and demand patterns of agricultural goods for hotels in Puerto Plata and Sosúa were studied. The affect of tourism growth on the growth of local markets was also determined. Results of the surveys given to hotels in Playa Dorada and Sosúa are presented below.

Demand for Foodstuffs and the Effect on Marketing Systems for Playa Dorada and Sosúa Tourism Centers.

Fruits and Vegetables

Tables 4 and 5 illustrate the average consumption of fruits and vegetables for seven of the Playa Dorada hotels. These two tables demonstrate the relative demand for each hotel for most fruits and vegetables available, as well as the total monthly demand. Since one hotel in the complex did not fill out a survey, and one other was incomplete, the demand for the complex as a whole is greater than indicated in the total consumption row.

Table 4 - Average Monthly Consumption of Fruits, Playa Dorada Complex

Hotel	Banana Racimo	Lemon Sack	Melon each	Mandarin Orange (in season)	Grapefruit each
Playa D	53	15	1512	0	1525
Villas D	36	16	4000	0	2000
Heavens	70	12	725	-	1050
Dorado N	13	9	1050	0	744
Eurotel	55	20	1549	1850	2003
Radisson	31	11	1933	250	1598
V Caraibe	8	7	342	0	168
Total	**266**	**90**	**11111**	**2100**	**9088**
	(200-300 per racimo)	(800-900 per sack)			

Table 4 (Cont'd.)

Hotel	Orange each	Pineapple each	Mango (in season)	Watermelon (in season)	Papaya Dozen
Playa D	16190	5470	0	300	57
Villas D	12000	10000	2000	2000	30
Heavens	20000	4000	3000	850	67
Dorado N	11547	932	245	370	24
Eurotel	13725	2625	790	120	25
Radisson	18950	1775	0	130	68
V. Caraibe	3700	460	51	125	5
Total	**96112**	**25262**	**6086**	**3895**	**276**

In some cases, figures for the consumption of fruit are slightly unreliable. Many of the fruits are seasonal such as melons, mandarin oranges, mangos, and watermelons. Consumption varies greatly throughout the year being near zero when the good is not in season. Restaurants manage the seasonality problem by using whatever fruits are in season. When fruits are both coming in season and going out of season, the manager must decide if the lower quality is worth the higher price. Melon, watermelon, and grapefruit were not being sold in the Puerto Plata market in large quantities during the period of the study. The season for these fruits generally would begin in January.

Another point of note is that fruits and some vegetables are measured in "*unidades*," per piece, not by weight. Due to time constraints and displeasure expressed by restaurant managers in divulging how much money was spent on food, only the number of fruits was recorded.

Oranges, bananas, and pineapples were the fruits most used by restaurants in the complex. Grapes, consumed in such small quantities, and apples, imported for the traditional thanksgiving season, were not included in table 4.

Table 5 - Average Monthly Consumption of Vegetables, Playa Dorada Complex

	Lettuce lbs	Potato lbs	Onion sack	Plum Tomato lbs	Salad Tomato lbs	Cabbage heads	Celery lbs	Carrot lbs
Playa D	1658	4446	1125	900	1175	684	397	1031
Villas D	1200	4000	2000	100	400	1200	200	400
Heavens	5800	3250	2975	115	4100	763	1000	6500
Dorado N	1224	4265	575	1070	0	80	143	585
Eurotel	2180	8156	1000	1000	1385	361	406	1366
Radisson	1617	2337	901	927	2096	322	459	1392
V. Caraibe	472	2335	252	33	311	105	80	292
Total	**14151**	**28789**	**8828**	**4145**	**9467**	**3515**	**2685**	**11566**

	Broccoli lbs	Yuca each	Cucumber each	Cauliflower each	Plantain each	Tayota dozen	Avocado each	Beets lbs
Playa D	174	585	545	0	7854	50	1050	832
Villas D	-	400	400	-	5000	-	-	-
Heavens	285	0	1100	183	1100	195	750	550
Dorado N	385	359	241	76	3220	20	147	103
Eurotel	0	665	783	311	6909	40	376	354
Radisson	480	805	769	114	5074	182	732	313
V. Caraibe	33	331	80	48	2874	162	104	96
Total	**1357**	**1573**	**3918**	**732**	**35031**	**1194**	**3159**	**2494**

	Molondrones each	Auyama each	Sweet Potato (lbs)	Eggplant each	Zapote each	Vainita lbs	Green Pepper (ea)	Leeks lbs
Playa D	160	759	351	250	12	211	454	110
Villas D	-	-	-	-	-	-	-	-
Heavens	200	150	160	1500	600	300	300	60
Dorado N	0	358	40	21	0	115	295	65
Eurotel	16	282	479	750	0	532	841	232
Radisson	87	11	489	468	20	324	1185	50
V. Caraibe	12	135	209	75	158	57	150	50
Total	**475**	**1695**	**1728**	**3065**	**790**	**1539**	**3225**	**567**

Hotel	Yautia lbs	Zuchini	Spinach package	Garlic lbs	Parsley package
Playa D	352	0	366	180	130
Villas D	-	-	-	-	-
Heavens	70	0	0	80	20
Dorado N	40	145	49	45	80
Eurotel	332	0	78	124	36
Radisson	60	540	105	118	0
V. Caraibe	28	0	0	25	-
Total	**882**	**685**	**568**	**572**	**266**

The problem of seasonality is not as great in the case of vegetables as it is for fruits. Avocados are seasonal, but the avocado is actually a fruit. Much of the vegetable crops are grown in the highland valleys where temperatures are less variable year round.

Tables 6 and 7 present the average monthly consumption of fruits and vegetables for eleven restaurants in Sosúa. This represents approximately thirty five percent of the restaurants within Sosúa.

Table 6 - Average Monthly Consumption of Fruits - Selected Sosúa Restaurants

Hotel	Banana Racimo	Lemon Sack	Melon each	Mandarin each	Grapefruit each
Shooters	0	2	0	0	0
Casa Marina	6	4	220	0	300
P.J's	1	4	96	0	0
Los Amigos	20	5	200	0	3500
Morua Mai	4	5	40	0	500
Hotel Sosúa	5	2	105	0	0
Hotel Yaroa	14	5	300	0	0
Woody's	16	5	120	0	500
Nuevo Sol	7	3	150	0	260
S by the Sea	4	4	200	0	160
Lorenzo's	1	5	0	0	0
Total	**78** (200-300 per racimo)	**44**	**1431**	**0**	**5220**

Hotel	Orange	Pineapple	Mango	Watermelon	Papaya
Shooters	2000	50	0	0	0
Casa Marina	2400	320	0	24	64
P.J's	0	60	0	16	24
Los Amigos	3500	700	0	180	215
Morua Mai	500	500	0	50	24
Hotel Sosúa	1000	100	0	5	12
Hotel Yaroa	3200	233	0	14	35
Woody's	3000	300	0	120	33
Nuevo Sol	2400	340	0	36	28
S by the Sea	3500	450	0	16	36
Lorenzo's	0	60	0	0	20
Total	**21500**	**3113**	**0**	**461**	**491**

One can see that although the sample of restaurants in Sosúa is larger than that of Playa Dorada, the total consumption is smaller. Businesses within Sosúa are smaller in scale. For example, the average per hotel consumption of oranges is 13,730 for Playa Dorada and 2,388 for Sosúa (excluding two restaurants that used no oranges).

Table 7 - Average Monthly Consumption of Vegetables - Selected Sosúa Restaurants

Hotel	Lettuce lbs	Potato lbs	Onion lbs	Plum Tomato lbs	Salad Tomato lbs	Cabbage each	Celery lbs	Carrot lbs
Shooters	80	200	200	0	80	80	0	80
Casa Marina	190	1200	300	6	6	72	72	350
P.J's	2000	6400	400	3	15	160	120	400
Amigos	900	2000	600	10	0	450	450	972
Morua Mai	400	900	300	7	2	300	100	550
Hotel Sosúa	300	500	90	3	100	0	20	105
Hotel Yaroa	1170	1600	200	8	510	0	75	200
Woody's	550	1800	200	2	8	450	80	280
Nuevo Sol	850	1900	400	2	12	100	300	150
S by the Sea	200	760	196	4	4	24	35	160
Lorenzo's	240	0	200	25	0	200	40	0
Total	**6880**	**17260**	**3086**	**70**	**737**	**1836**	**1292**	**3247**

	Broccoli Package	Yuca	Cucumber	Cauliflower	Plantain	Tayota	Avocado	Beets
Shooters	0	0	140	0	30	0	0	0
Casa Marina	0	65	300	0	600	48	0	60
P.J's	0	60	100	0	0	24	0	0
Amigos	10	30	600	0	1500	100	300	600
Morua Mai	0	0	300	10	500	720	300	100
Hotel Sosúa	390	50	90	0	50	250	130	0
Hotel Yaroa	0	200	175	0	50	525	200	0
Woody's	0	50	250	0	90	300	400	200
Nuevo Sol	40	60	350	0	75	150	140	80
S by the Sea	48	120	160	48	550	120	120	100
Lorenzo's	0	0	40	0	0	0	0	0
Total	**488**	**635**	**2505**	**58**	**3445**	**2237**	**1590**	**1140**

	Molondrones	Auyama	Batata	Eggplant	Zapote	Vainita	Garlic
Shooters	0	0	0	0	0	0	0
Casa Marina	0	0	0	0	0	0	60
P.J's	0	0	0	0	0	0	20
Amigos	0	1000	0	350	0	0	125
Morua Mai	50	600	0	166	0	10	75
Hotel Sosúa	0	0	0	0	0	97	10
Hotel Yaroa	0	0	0	0	0	259	20
Woody's	0	10	0	100	0	0	30
Nuevo Sol	40	0	0	140	0	38	20
S by the Sea	120	60	120	200	35	45	15
Lorenzo's	0	0	0	0	0	0	100
Total	**210**	**1670**	**120**	**956**	**35**	**449**	**375**

The following hypotheses pertain to expected supply patterns of hotels within Playa Dorada and those in Sosúa.

Hypothesis 1: Fruits and vegetables supplied to Playa Dorada hotels are being obtained from outside the province (primarily through the market in

Santiago), while those supplied to Sosúa are coming from within the province (mainly the market in Puerto Plata).

It was believed that the market in Puerto Plata had not grown sufficiently to meet the substantial demand for foodstuffs by tourism in the Playa Dorada. Santiago, the second largest city in the Dominican Republic, already had the established network of farmers and intermediaries bringing goods to sell in the *hospedaje*, the large market of Santiago. Hotels must merely make the 69 km trip. Due to the smaller scale of hotels and restaurants within Sosúa, and the increased distance to the market in Santiago, it was expected that the market in Puerto Plata would be a more important source of goods than it was for the hotels in Puerto Plata.

Table 8 - Playa Dorada, Trips to and from Vegetable Markets, Average Monthly Visits

	Santo Domingo	Santiago	Puerto Plata	Other
Radisson	16		4 mkt	
Eurotel	4	8	2 mkt	
			4 mess	
Caraibe		4	4 mkt	2 Constanza
			4 mess	
Naco		8	4 mkt	4 Jarabacoa
		6	4 mess	
Holiday		20	2 mkt	
			2 other	
			16 mess	
Villas Doradas		16	12 mkt	
			8 mess	
			4 other	
Total	**20**	**62**	**66**	**6**

mess= Silverio Messon-wholesaler
mkt = Puerto Plata public market

We can see that for the supply of fruits and vegetables to the Playa Dorada Complex the most visits are made to markets within the city of Puerto Plata. Next follow Santiago and Santo Domingo and the "other" locations of Constanza and Jarabacoa. While this is contrary to what had been hypothesized, it is plausible since the market in Puerto Plata is ten minutes (5 km) away from Playa Dorada while Santiago is an hour (69 km). The Constanza

and Jarabacoa valleys are considerably farther with some treacherous roads. The one hotel that received fruits and vegetables from Santo Domingo did not go there directly but called in orders over the phone. A supplier brought fruits and vegetables with its meat delivery.

But, the number of trips made to the market is only one measure of the importance of that market as a source of goods. We must also look at what and how much has been purchased. It was found through questionnaires and interviews that most of the goods were purchased in Santiago. Six of the seven hotels contacted stated that the market in Santiago was the primary source of fruits and vegetables and that the two main markets/suppliers in Puerto Plata were used to replenish goods that might have run out. The percentage breakdown of fruits and vegetables by origin was determined for two hotels. The detailed breakdown for the two hotels, serves as an example of the relative importance of the two cities' markets.

Table 9 - Selected Fruits and Vegetables by Origin of Purchase Percentage (average high and low seasons) for Two Playa Dorada Hotels

		Puerto Plata Market	S. Messon	Santiago	Other
Fruit					
Banana	H1	14	27	59	
	H2	12	20	58	
Limes	H1	22	19	59	
	H2	10	23	67	
Melons	H1	46		54	
	H2	28	20	52	
Mandarins	H1	35		65	
	H2	40		60	
Grapefruit	H1	21		79	
	H2	18		82	
Orange	H1	9	30	61	
	H2	15	19	41	25
Pineapple	H1	2	16	82	
	H2	10	15	35	40
			Vegetables		
Celery	H1	9	8	83	
	H2	5	15	80	
Potatoes	H1	3	16	81	
	H2	8	20	72	
Onion	H1	0	18	82	
	H2	10	43	47	
Salad	H1	0	23	77	
Tomato	H2	11	20	69	
Plum	H1	0	6	94	
Tomato	H1	14	18	68	

Table 9 (Cont'd.)

Carrots	H1	3	11	86
	H2	9	27	64
Cabbage	H1	5	11	84
	H2	2	19	79
Beets	H1	0		100
	H2	4		96
Plantain	H1	0		100
	H2	10		90

We can see that for these two hotels, the majority of purchases of vegetables are made from the *hospedaje,* the public market in Santiago. Of course, these two hotels are not totally representative of the whole complex. The hotel receiving goods directly from Santo Domingo would not follow this pattern.

Table 10 - Sosúa Restaurants - Trips to and from Established Vegetable Markets, Average Monthly Visits

	Santo Domingo	Santiago	Puerto Plata	Other
Shooters		20	0	
Casa Marina		8 (high)	8	
P.J.'s		8	0	10
Amigos		8	20	10
Morua Mai		8	20	10
Hotel Sosúa		0	20	8
Hotel Yaroa		0	20	8
Woody's		8	4	0
S by the Sea		0	20	8
Lorenzo's		20	8	10
Nuevo Sol		8	8	10
Total	**0**	**88**	**128**	**74**

As found for the hotels in Puerto Plata, the restaurants in Sosúa make more trips to Puerto Plata than any other market. If we compare the frequency of visits to different cities to buy vegetables of restaurants in Playa Dorada and Sosúa using the chi-square test, we can accept or reject the hypothesis that restaurants supply patterns are significantly different.

Hypothesis 1 results - At seven degrees of freedom the critical chi-square statistic at the .01 significance level is 18.475. The chi-square statistic for this distribution is 66.53. We can reject the null; there is a significant difference between the frequency of visits to different markets.

Fruits and vegetables found in abundance locally were brought directly to hotels by itinerant vendors. That is, crops such as oranges and avocados were purchased in Santiago and from local vendors coming mainly from within the Province of Puerto Plata.

Since the number of itinerant vendors fluctuates, records of itinerant providers are not well kept, an attempt to determine the number was not made. However, it was possible to determine the types of goods that were provided by suppliers coming directly to the hotel. In some cases specific providers were mentioned as well as the item they brought, in others the more general statement of items brought by itinerant sellers was elicited from the hotel contact. Table 11 lists for the seven hotels, the type of goods and the number of hotels that bought goods from itinerant vendors.

Table 11 - Playa Dorada - Goods Brought to and Number of Hotels Purchasing from Itinerant Suppliers

	Number of Hotels
Avocado	1
Lettuce/traditional	1
Pineapple	4
Melon	3
Watermelon	4
Orange	4
Papaya	1
"Vegetables"	2
Fruit	1
Grapes	3
Plantain	1

The four products most often brought to hotels by itinerant providers were pineapple, melon, watermelon, and oranges. They are usually brought on a weekly basis with each provider bringing only one item in large quantities. Grapes were bought by one provider from Jimaní and "fruits and vegetables" were brought to the hotel by commercial markets from Puerto Plata.

Meat and Poultry

Table 12 presents the average monthly consumption of meat and poultry for Playa Dorada.

Table 12 - Average Monthly Consumption of Meat and Poultry, Playa Dorada Hotels

Hotel	Prime Beef	Beef Other	Chicken	Duck	Goat
Playa D	-	-	-	-	-
Villas D	1800	200	2400	0	0
Heavens	2100	900	6000	0	0
Dorado N	2582	37	3529	0	0
Eurotel	2122	413	7482	0	65
Radisson	2262	0	5071	0	0
V. Caraibe	1137	49	2000	0	0
Total	**12003**	**1599**	**26482**	**0**	**65**

	Lamb	Pork	Turkey	Veal	Ham	Bacon
Playa D	-	-	-	-	-	-
Villas D	50	1200	0	200	500	540
Heavens	200	1300	0	800	600	600
Dorado N	97	1036	0	356	483	1089
Eurotel	0	465	0	405	287	902
Radisson	204	1653	75	200	1229	1545
V. Caraibe	41	772	0	0	260	347
Total	**592**	**6426**	**75**	**1961**	**3359**	**5023**

The meats used in greatest quantities are beef, chicken, and pork, with chicken being by far the most popular meat. For Sosúa, the amounts consumed are less, with less variety of meat use (Table 13).

Table 13 - Average Monthly Consumption of Meat and Poultry, Selected Sosúa Restaurants

	Prime Beef	Other Beef	Chicken	Duck	Goat
Shooters	0	1600	1200	0	0
Casa Marina	500	400	600	0	0
P.J's	0	2800	2400	0	0
Amigos	490	0	2000	0	0
Morua Mai	390	0	1200	0	0
Hotel Sosúa	0	100	90	0	0
Hotel Yaroa	150	0	120	0	0
Woody's	200	1000	600	0	0
Nuevo Sol	180	400	1000	0	0
Sosúa by the Sea	140	500	500	40	0
Lorenzo's	120	800	800	0	0
Total	**2170**	**7600**	**10510**	**40**	**0**

Table 13 (cont'd.)

	Lamb	Pork	Turkey	Veal	Ham	Bacon
Shooters	0	0	0	0	0	0
Casa Marina	80	320	0	160	120	300
P.J's	0	0	0	0	400	300
Amigos	0	500	0	0	20	160
Morua Mai	0	300	0	0	20	20
Hotel Sosúa	0	105	0	50	45	60
Hotel Yaroa	0	310	0	210	274	239
Woody's	0	280	0	0	222	200
Nuevo Sol	0	300	0	0	160	110
Sosúa by the Sea	50	160	40	0	200	160
Lorenzo's	0	40	0	0	240	40
Total	**130**	**1292**	**40**	**420**	**1017**	**1589**

As found for Playa Dorada the most consumed meats were chicken, beef, and pork.

Hypothesis 2a: The supply pattern for meats for Sosúa and Playa Dorada is significantly different. For Playa Dorada meats are coming from outside the province, primarily Santo Domingo. For Sosúa, meats are coming from within the province.

This is due to the fact that most of the slaughterhouses are located in Santo Domingo. Hotels are able to buy in large quantities in advance of the upcoming high season, and freeze the meat.

Table 14 - Playa Dorada - Origin of Meat Purchases
Frequency of Hotels Having Suppliers in each Location

	Santo Domingo	Santiago	Puerto Plata	Sosúa
Beef	6	3	5	0
Chicken	5	3	1	
Chivo			1	
Lamb	1			
Turkey	1			
Veal				1
Bacon	4			2
Ham	4			1
Pork	1		4	
Salchicha	2		4	1
Total Frequency	**24**	**6**	**15**	**5**

Table 15 - Number of Meat and Poultry Suppliers used in Source City, Playa Dorada Complex

Hotel	City		
	Santo Doming	Santiago	Puerto Plata/Sosúa
Playa D	4	1	3
Villas D	2	2	2
Heavens	-	-	-
Dorado N	1	2	4
Eurotel	4	0	1
Radisson	2	1	2
V Caraibe	2	1	1
Total	**15**	**7**	**13**

For meat and poultry it was not possible to determine the percentage of meat purchased from each source. For many of the hotels, records concerning consumption were obtained; these did not coincide with purchases that were usually made months in advance and in bulk.

The quantity of meats purchased from different suppliers was not determined, therefore the relative importance of different suppliers cannot be determined. Also, in terms of the number of suppliers, some hotels listed specific local suppliers and others did not therefore the numbers are not comparable. Regardless of the quantity of meats purchased, it appears that there is not a strong bias toward purchasing meats from suppliers in Santo Domingo. This does not mean that meats do not come from the Capital, but that they are not being purchased directly.

Table 16 - Origin of Meat Purchases, Sosúa Restaurants - Frequency of Restaurants

	Santo Domingo	Santiago	Puerto Plata	Sosúa	Moca	Gaspar Hernandez
Beef	3		3	4	1	
Chicken	2	3	3	4	3	2
Chivo						
Lamb	1		2			
Turkey		1				
Veal			2	1		
Bacon	3	2	1	5	1	
Ham	3	2	1	5	1	
Pork	4	2	5	5	5	
Total	**16**	**10**	**17**	**24**	**16**	**2**

Hypothesis 2a Results - As expected, hotels in Sosúa were less dependent on Santo Domingo for their source of meat. That is, the sources are more dispersed throughout the north coast and the country. The chi-square test comparing the distribution of suppliers for Playa Dorada and Sosúa was conducted. At the .01 level, with 11 degrees of freedom, the critical value of chi-square is 24.725. The calculated value was 25.37; we can reject the null and state that there is a significant difference between the supply patterns of meat and chicken between Sosúa and Puerto Plata.

Seafood

Tables 17 and 18 represent the average monthly consumption of seafood for the Playa Dorada complex.

Table 17 - Average Monthly Consumption of Seafood, Playa Dorada Hotels

Hotel	Sea Bass	Snapper	Lobster	Shrimp	Carite	Chillo	Lambi	Pulpo	Other
Playa D	-	-	-	-	-	-	-	-	-
Villas D	1200	1200	400	400	0	-	-	-	-
Heavens	350	0	150	200	0	0	0	0	207
Dorado N	827	0	203	605	0	111	135	127	109
Eurotel	781	0	819	315	0	-	0	66	
Radisson	345	0	918	336	0	823	53	0	0
V. Caraibe	256	0	53	182	0	32	58	5	0
Total	**3759**	**1200**	**2543**	**2038**	**0**	**966**	**246**	**198**	**316**

Table 18 - Average Monthly Consumption of Seafood, Sosúa Hotels

Hotel	Sea Bass	Snapper	Lobster	Shrimp	Carite	Chillo	Lambi	Pulpo
Shooters	0	0	0	0	0	0	0	0
Casa Marina	300	25	100	100	50	50	0	50
P.J's	0	0	0	0	0	0	0	0
Amigos	350	100	100	100	100	100	100	50
Morua Mai	350	100	100	100	75	75	750	50
Hotel Sosúa	60	0	0	0	0	0	0	0
Hotel Yaroa	366	0	154	258	0	0	0	0
Woody's	190	0	0	0	0	0	0	40
Nuevo Sol	300	0	60	140	100	0	0	50
S by the Sea	350	0	40	60	0	150	0	80
Lorenzo's	100	0	0	0	0	0	0	80
Total	**2366**	**225**	**554**	**758**	**325**	**375**	**850**	**400**

Hypothesis 2b: For Playa Dorada supply of fish comes from outside the province, primarily Santo Domingo. For Sosúa, supply of fish originates from within the province.

It was thought that local sources would supply fish to Sosúa more than for Playa Dorada, since the demand would not be as great, and local fishermen could fulfill it. Tables 19 and 20 present frequency of hotels purchasing fish in various locations within the Dominican Republic.

Table 19 - Origin of Fish Purchases, Frequency of Playa Dorada Hotels

	Santo Domingo	Santiago	Puerto Plata	Samaná	Rio San Juan	Monti Cristi
Langostino	1		1	1		
	1					
Langosta		1	3		1	
Sea Bass (Mero)	2	1	3	2		0
Octopus (Pulpo)		1	1			1
Chillo	1		1	2		0
Carite			1			0
Shrimp	1			2	1	0
"Frozen Fish"	3					0
Lobster Tail	2		1			0
Lambi			3			
Oysters			1			
Total Frequency	**10**	**3**	**15**	**7**	**2**	**1**

The origin of fish purchases seems to be fairly evenly dispersed throughout the north coast and the country as a whole, with most of the purchases made from suppliers in Puerto Plata. As in the case for meat consumption, the total quantity purchased from each source city was not available.

Table 20 - Origin of Fish Purchases, Frequency of Sosúa Hotels

	Santo Domingo	Gaspar Hernandez	Sosúa	Samaná	Rio San Juan	Monti Cristi
Langostino			1		2	
Langosta			1			1
Sea Bass		1	1	2	4	2
(Mero)						
Octopus			2			
(Pulpo)						
(Chillo)						1
Shrimp					2	
"Frozen Fish"	1					
Lambi						1
Pez Dorado			1			
Tuna			1			
Salmon		3		2	2	2
Shark		3		2	2	2
Total	**1**	**7**	**7**	**6**	**12**	**9**

Hypothesis 2b results - The chi-square test was conducted comparing the distribution of suppliers of seafood to Playa Dorada and Sosúa. At the .01 significance level, with 11 degrees of freedom, the value of chi-square is 24.725. The calculated value was 30.596; we can reject the null and state that there is a significant difference between the supply patterns of fish between Sosúa and Puerto Plata.

Dairy Products

The final set of goods presented for Playa Dorada and Sosúa are dairy products (Tables 21 and 22). For some time there has been in increasing crisis concerning the supply of fresh milk. This has had an effect on the supply of all dairy products.

Table 21 - Average Monthly Consumption of Dairy Products, Playa Dorada Hotels

Hotel	Butter	Eggs	Cheese Danes	Cheese Holandes	Ice Cream Quart	Milk Powder	Milk	Cream Cheese	Other
Playa D	-	31800	-	-	-	-	-	-	-
Villas D	2400	24000	350	100	0	240	-	-	-
Heavens	750	20000	300	40	15	120	0	40	0
Dorado N	850	22950	522	0	48	11	79	125	76
Eurotel	1950	38469	113	17	26	983	0	0	286
Radisson	1800	30208	356	0	24	1300	38	0	-
V. Caraibe	145	5607	187	6	24	159	29	19	11
Total	**7895**	**173034**	**1828**	**163**	**137**	**2813**	**146**	**184**	**373**

Table 22 - Average Monthly Consumption of Dairy Products, Sosúa Restaurants

Hotel	Butter	Eggs	Cheese Danes	Cheese Holandes	Ice Cream Quart	Milk Powder	Milk	Cream Cheese	Other
Shooters	10	48	10	0	0	0	1	0	0
Casa Marina	200	4600	168	0	12	0	28	0	0
P.J's	200	4800	288	0	0	0	15	0	16
Amigos	100	1800	30	15	0	150	0	25	5
Morua Mai	100	600	30	10	0	150	0	25	25
Hotel Sosúa	130	1000	40	20	20	0	1	2	1
Hotel Yaroa	526	2650	200	30	38	0	3	7	5
Woody's	200	2900	100	0	10	20	2	10	5
Nuevo Sol	150	3800	40	20	0	30	2	15	4
S by the Sea	250	3600	80	20	5	240	0	45	5
Lorenzo's	120	2340	0	0	0	40	0	0	120
Total	**1986**	**28090**	**986**	**115**	**85**	**630**	**52**	**129**	**186**

Hypothesis 3: Supply patterns for dairy products for Playa Dorada and Sosúa will not be significantly different. The majority of dairy products originate within the province of Puerto Plata. The province has traditionally been a dairy producer, and the high perishability would preclude bringing in dairy products from outside sources.

Table 23 - Origin of Dairy Products, Frequency of Playa Dorada Hotels

	Santo Domingo	Santiago	Puerto Plata	Sosúa	Monte Llano	Moca
Fresh Milk		5	1	1		
Cream			1	4		
Eggs		1	0	1	1	4
Yogurt			1			
Butter				6		
Ice Cream			4			
Cheese			2	5		
Cream cheese				2		
Eggs (Codorniz)		2				
Total Frequency	**0**	**8**	**9**	**19**	**1**	**4**

Table 24 - Origin of Dairy Products, Frequency Sosúa Restaurants

	Santo Domingo	Santiago	Puerto Plata	Sosúa	Moca
Fresh Milk/Cream	1	2	2	8	
Eggs	1	10	1	4	
Butter	1	2	2	8	
Cheese	1	2	2	8	
Total Frequency	**4**	**16**	**7**	**28**	**0**

Hypothesis 3 results - Dairy products are coming mainly from within the municipality of Sosúa. It was expected that in the case for dairy products, there would not be a significant difference between the supply patterns of Playa Dorada and Sosúa. The chi-square test was used to compare the frequency of purchases from the different source regions. The calculated chi-square statistic was 11.98; for 11 degrees of freedom the value of chi-square is 19.675 at the .05 significance level. Therefore, we cannot reject the null. There is no significant difference between the two locations in terms of the sources of dairy goods.

Markets

The four fruit and vegetable markets contacted for the study were located within the province of Puerto Plata. They included: 1) the public market in Puerto Plata (labeled Puerto Plata), 2) a large wholesaler supplying hotels, restaurants, and the public (Silverio), and two smaller markets located in the town of Sosúa, 3) the small-scale vegetable stand (Sosúa), and 4) the larger wholesaler and retailer (Mario). Tables 25 and 26 represent the average monthly sales of fruits and vegetables for these markets.

Table 25 - Average Monthly Sales of Fruits, Sosúa and Puerto Plata Markets

Market	Banana Racimo	Lemon Sack	Melon	Mandarin	Grapefruit
Sosúa	32	2	0	-	800
Mario	64	32	300	-	800
Silverio	100	60	0	-	15200
Puerto Plata	400	50	675	-	124000
Total	**596**	**144**	**975**	-	**140800**

Hotel	Orange	Pineapple	Mango	Watermelon	Papaya Dozen
Sosúa	2400	300	-	-	12
Mario	2000	1200	-	-	8
Silverio	26000	6000	-	-	120
Puerto Plata	350000	28800	-	215	1096
Total	**380400**	**36300**	-	**215**	**1236**

Table 26 - Average Monthly Sales of Vegetables, Sosúa and Puerto Plata Markets

	Lettuce Lbs	Potato Lbs	Onion bag=50 lbs	Tomato (plum)	Tomato (salad)	Cabbage	Celery
Sosúa	240	200	1	8	8	48	40
Mario	3200	3000	40	80	40	1200	800
Silverio	10000	32000	40	100	100	1000	1600
Puerto Plata	6800	19800	188	184	168	5200	1120
Total	**20240**	**55000**	**269**	**372**	**316**	**7448**	**3560**

	Broccoli Package	Yuca	Cucumber	Cauliflower	Plantain	Tayota	Avocado	Beets
Sosúa	80	0	144	80	2000	12	-	0
Mario	1600	1600	2000	0	2800	160	-	640
Silverio	1400	400	2000	1400	8000	100	-	1280
Puerto Plata	50	9200	9800	0	112400	852	24000	2800
Total	**3130**	**11200**	**13944**	**1480**	**125200**	**1124**	**24000**	**4720**

	Molondrones	Auyama	Batata	Eggplant	Zapote	Vainita	Green Pepper	Leeks
Sosúa	-	-	-	200	-	0	96	-
Mario	-	12	0	800	-	0	400	-
Silverio	-	60	80	1600	-	0	1400	-
Puerto Plata	-	1700	-	650	-	-	10800	-
Total	**-**	**1772**	**80**	**3250**	**-**	**-**	**12696**	**-**

Hotel	Yautia	Zuchini	Spinach	Garlic	Parsley Package	Carrot lbs
Sosúa	0	-	-	12		200
Mario	800	-	-	60		2400
Silverio	-	-	-	-		6000
Puerto Plata	9600	-	-	-	220	4800
Total	**10400**	**-**	**-**	**72**	**220**	**13400**

Market Descriptions

Sosúa Market

The smallest market in the survey, the Sosúa market could more realistically be called a vegetable stand. Currently it is run by four men and one woman. The mother of one of the men started the stand in 1958. They buy their goods from Puerto Plata by hiring a taxi since they have no truck. During the low season they go two times a week. During the high season they go every day. They use the basement of a nearby building for storage. They primarily sell directly to tourists with clean, attractive looking vegetables at higher prices. The owners indicated that business has doubled in the past three years.

Mario's Market

The other vegetable market within El Batey has been open since April of 1988. The owner previously had a stand on the sidewalk for many years. The owner indicated that his business had grown about 50% since moving indoors. He had expected business to be better.

Puerto Plata Market

The market in Puerto Plata is made up of about 25 stalls forming three sides of a rectangle. In the fourth side, handicrafts are sold. Next to this is a star shaped structure in which handicrafts are also sold. At the time of this study, three of the vegetable stands were empty, two sold eggs and brushes, ten sold only fruits and ten sold both fruits and vegetables. Oranges and lemons were also sold in rectangular bins in the center of the market.

The market was opened in January 1987. Previously, the market had been located "down below" in lower Puerto Plata (the current market is atop a hill). Approximately one-third of the stall owners had previously been located at the old marketplace.

Silverio Messon

This wholesaler has been in business for 30 years selling all types of foods to restaurants, hotels, and retail establishments. The owner estimates that business has grown 50% since 1984, primarily in the availability and demand for fruits and vegetables. Five years ago no vegetables were sold except potatoes. In 1984 they began going to Santiago for vegetables, and three years ago they began going directly to Constanza. Through Silverio Messon I was able to obtain a list of which vegetables were obtained in Constanza and which were obtained from the market in Santiago (Table 28). I also made a trip to the valley of Constanza with the Messon Truck. Both the list and the trip confirmed the apparent importance of Constanza as a source for certain agricultural goods.

While it is believed that the growth of the public market in Puerto Plata was indirectly due to tourism growth through the increased demands of new permanent residents rather than tourists themselves, I was unable to collect solid evidence for verification. The fruit and vegetable manager at Silverio Messon estimated that from 60 to 90 percent of most fruits and vegetables were sold to restaurants.

Table 27 - Supply Patterns to Markets

Sosúa	To Puerto Plata Market two times a week. To Silverio Messon for Broccoli and Cauliflower.
Mario	To Santiago two times a week. Occasionally to Puerto Plata.
Silverio	Plantains, Pineapples and Oranges brought directly. Trip to Constanza 2 times a week. Trip To Santiago market three times a week
Puerto Plata	Varied for each vendor

Table 28 - Puerto Plata Market - Supply of Vegetables, by Origin

VEGETABLES

Constanza (directly)	Santiago (market)	Moca/la Vega/Sabaneta	Throughout the north
	Eggs	Avocado	Onion
	Garlic	Plantain	
	Potato		
	Onion		
	Tomato		
	Cabbage		
	Celery		
	Carrot		
	Broccoli		
	Yuca		
	Cucumber		
	Plantain		

Table 29 - Silverio Messon - Supply of Fruits and Vegetables, by Origin

VEGETABLES

Constanza only	Constanza/Santiago	Santiago
Lettuce	Carrots	Tomato
Potato	Tayota	Yuca
Celery	Green Pepper	Cucumber
Zuchini	Onion	Cabbage
Broccoli		Plantain
Cauliflower		Eggplant
Parsley		
Leeks		

FRUITS

Marmon	Santiago
Lemon	Pineapple
Grapefruit	Papaya
	Banana
	Orange

These are generalizations, supplied by the head of purchasing at the Silverio Messon warehouse and stall owners at the Puerto Plata market. The differences between tables 28 and 29 are primarily due to different methods of supply and not actual origin. At the Puerto Plata market vegetables are purchased from Santiago. Furthermore, they probably come from Constanza. Fruits, which are available locally, are brought by vendors who come from throughout the province the locations listed are just examples and there are most likely many more. For Silverio Messon, company owned trucks were able to drive directly to Constanza. Fruits were bought directly in Santiago as well as purchased from vendors, although the purchasing manager did not know where the vendors came from.

Cattle farming, Milk Production, and Land Use Change

Sugar Cane Fields

The growth of tourism has not been a direct cause but a convenient solution to the lessening importance of sugar cane in the nation's economy. Due to a variety of factors such as declining prices on the world market and decreased American quotas, and increased emphasis on the growth of tourism, sugar cane production has become a less important part of the Dominican economy. However, even today, the northern region of the country has substantial territory dedicated to sugar cane production. Much of the north coast was

previously zoned agricultural. This includes the airport (5,000 tareas), Playa Dorada (150 hectare), Monte Llano (27,000 tarea still in production) and numerous resort complexes.

The sugar cane fields in Monte Llano are still in production but ownership has changed from the Consejo Estatal de Azucar (CEA) or State Sugar Council, to INFRATUR or Department of Tourism Infrastructure. Details of the sale of the land to INFRATUR are not clear. The Sugar Council, supporting a large debt, agreed to sell the land in Monte Llano to the Central Bank for approximately 500,000,000 pesos. In this way, the CEA could recover its financial losses and the Banco Central would have an opportunity to develop the land, most likely for its tourism potential. Due to commitments to developing and maintaining the Playa Dorada and Playa Grande resorts and the high cost of developing infrastructure for the vast amount of land available, plans for the land are uncertain. In the Sept. 30 - 6 Oct., 1988 issue of El Faro (a weekly publication dedicated to reporting tourism news), the director of INFRATUR affirmed that it had "received purchase offers from both foreign and local investors for the Monte Llano sugarcane mills' land, but so far hadn't sold an inch of it."

Cattle Farms

To study the effect of tourism on land values and the possible reduction of agricultural land, real estate agents, long term residents and the members of Productos Sosúa were interviewed. Although real estate is notorious for being a secretive business, and sellers of land prefer the price to remain confidential, I was able to gather basic facts and trends regarding land values in the Sosúa area. To avoid confusion, a table of land conversions is provided.

Table 30 - Land Conversions

1 meter = 3.28 feet
1 square meter = 10.76 square feet
1 acre = 43,560 square feet
1 acre = 4,047 square meters
1 hectare = 10,000 square meters
1 hectare = 2,471 acres
1 centiaria = 1 square meter
1 Tarea = 629 square meters

A method of measuring land which is unique to the Dominican Republic is the tarea. It is said to have been "invented" by a Spaniard who sent his workers out into the field and gave the name of tarea (which means work in Spanish) to the amount of territory that was cleared in one day. In this study, farm sizes were given in tareas, hectares and square meters.

Hypothesis 4: Tourism has been a factor in the movement of landowners out of cattle raising and dairy farming. As expected, land prices in the town of Sosúa and surrounding areas have risen with the development of tourism. According to Joseph Benjamin, President of Productos Sosúa, in 1972 he sold a strip of ocean front property just outside Sosúa for one dollar ($1) per square meter. Now, in 1988, the land is worth fifty-five dollars ($55) per square meter. In some ways it is difficult to determine the value of land. Many factors go into determining the price. A parcel's value as a farm is different from its land value. For example, the farm value could be 500 pesos per tarea or approximately 13 cents per square meter. If the land is used as a farm the profit would be less than if used for tourism, hence the price would be lower. Undeveloped it could sell to a tourism developer in 1988 for about ten dollars ($10). This price is up from six dollars ($6) in 1984 and eight dollars ($8) in 1986 (average estimates provided by real estate offices and local land owners).

Before developing his land Benjamin sold a portion for eight dollars ($8) a square meter. He is currently developing approximately 300,000 square meters at a cost of 3.5 million pesos (583,333 dollars or $1.95 per square meter). The Reuters are selling lots of 1,000 to 2,000 square meters near Cabarete for twelve dollars ($12) per square meter. These lots are developed with streets, water, and electricity. Kirscheimer sold his land (2,000 tareas) in el Choco in 1986 as a farm (which has continued as a farm) for 450,000 pesos (with the conversion rate of 2.80 pesos per dollar = $160,714 or $.13 per square meter). Koch intends to sell his developed land outside Sosúa for $15 dollars per square

meter. Brown started selling land in 1985 at sixteen (16) pesos per square meter and by 1987 the price was up to over 60 pesos.

The general consensus is that the tourist development in Sosúa and the surrounding area began in 1983. In 1983-1984 land surrounding the town was valued at ten dollars ($10.00) per square meter. In 1988 the average value of undeveloped land was forty-eight to fifty dollars ($48-50). Waterfront property within the town of Sosúa, "worthless" land that had been given to the Jewish settlers in the early 1940's, sold for one hundred and twenty-five ($125) dollars a square meter in 1985.

The impact of tourism on cattle farming in the Sosúa region has been varied. Some people have sold out to tourism while others have held out. Since milk production has been declining due to increased costs, it seems a viable alternative to sell the land for a reasonable price. Many of the original settlers are old. Their heirs have not stayed in the Dominican Republic and many of those that have are not interested in continuing the farming tradition. Some of those members who sold their land believed that the farm would continue to be operated. This was not always the case.

The land owners have accommodated tourism in different ways. Several either own or have interest in hotels in Sosúa. Several are building hotels and suburban developments, some are selling developed and undeveloped land in small parcels, and others are not selling or holding out for higher land prices.

Table 31 lists some recent activity of land sales/land use changes. As stated earlier, many of the largest land owners were content to represent themselves as "poor farmers" and down play their land holdings and intentions. The figures do help delimit the extent of the influence of the Sosúa tourism node on land values.

Table 31 - Productos Sosúa Land Ownership and Use Changes

Name	Location	size	date sold	new owner	Use
Benjamin, Joe	}1 km east of Sosúa	450 tarea	-		Cattle Farm
Benjamin, Sucs	}	550 tarea	na		Development
Biller	La Bombita	500 tarea	1983	Milz	Perla Marina
Brown	1 km east	1500 tarea (on 3 farms.)	1987-had sold 100,000 sq. m. (160 tarea)		
Cohnnen, Paul	La Bombita	30 hect.	1984-85		Development
	La Bombita	30 hect.	1984-85		Development
Cohnnen, Alfred	Atraversada	na			Cattle Farm
Eichen	Atraversada	500 tarea			Cattle Farm
Estrella	El Choco	1400 tarea			Cattle + other
	El Choco	6000 tarea			Cattle + other
Florsheim	na	500 tarea			na
Felix	El Choco	500 tarea			Cattle + other
Hauser	not within Sosúa				
Herzberg	1 km East (waterfront between treasure beach and sea horse ranch)	na	na		na
Hess	La Bombita (7 km)	100 acre	1987	R. Hernandez.	
Hirschfeld	El Choco	500 tarea	-		Cattle
	farther (8 km)	500 tarea	-		Frutos Menores
Kircheimer	El Choco	2000 tarea	1987		Farming
Company	Atraversada (7 km)	1000 tarea			Farming
Kirstein, Ana	na	na	na	Milz	Development
Koch, Felix	3 km	500 tarea	Developed part, ready to start selling		
Koch, Robert			Sold but still in production		
Kohnn	La Bombita	500 tarea	Sold to waterfront project in Bombita		
Meyerstein	Barroso	500 tarea	Plans on selling but hasn't made preparations		
	Camino Llibre	650 tar	Will sell when price is high enough		
Milz, Freddy	La Bombita	550 tarea			Farming
Reuter	Cabarete	700 tarea	1986 started developing		
Strauss	Madre Vieja (2km opposite Sea Horse Ranch)	}			Farming
	Near El Batey	}12,000 tareas			Farming
	El Choco	}			Farming
Wachsman, Luis	La Mulata	500 tarea	-		Farming
Wellisch	Colinas del Sol	na	na		
	El Choco	6500 tarea	-		Farming
Phillips	El Choco	7600 tarea		Cattle, pineapple, orange, avocado, papaya	
	El Choco	500	-		Farming
Company	El Choco	1500 }			
	Atraversada	600 }			Unused

Table 32 - Land Development - Sosúa

Name	Date Purchased	Size	Previous use/owner
Airport	1979	5000 tarea	Sugar Cane
Las Lomas			
Puerto Chiquito	1984-1985	30 hectares	P.Cohnnen
Terramar Estates	1983	700,000 sq. m.	
Treasure Beach		97,000 sq. m.	
Sea Horse Ranch	1984	250 acres	Cattle farm
Sol de Plata	1987	275,000 sq. m.	
Perla Marina	1986-7	800,000 sq. m.	Grazing
Palm Shores	1984-5	39 hectares	Cohnnen
Rancho Bonita			
Lomas de la Goleta	1984-85		
Costa Azul }	project starting	7,000,000 sq m	
Punta Goleta}	1988		
Woody's			Milz
Pro-Cab			
Colinal del Sol	early 1970's	1,000,000 sq. m.	Wellisch

Productos Sosúa

The relationship between land use changes and production of meat and milk is difficult to determine. Many factors have gone into the development of the Productos Sosúa company and affect its future as an important provider of dairy products on the north coast. The history of the company is important in explaining the system of its present day operations.

Productos Sosúa was formed as a meat and dairy cooperative in the early 1940's, by Jewish settlers seeking asylum. Originally, the company was a cooperative. When the cooperative became a shareholding company the larger producers acquired more shares. Most of the shareholders are the original Jewish settlers or heirs of the settlers. Other farmers provide milk and meat for production, but there are no new shareholders.

The company deals mainly with cheese and butter as well as meat processing. Yogurt and fresh milk sales are a small part of operation. There is currently a severe shortage of milk in the Dominican Republic, since government price controls made milk production unprofitable. For example, the company buys milk at RD $1.30 and is forced to sell at RD $.95. Hence, almost all of the fresh milk available goes into the production of

cheese, which has no price control. One way milk processors circumvent the price ceiling is to sell it as "dietetic" milk, or 2 % low fat, which does not have a price control.

Butter is made from anhydrous butter oil imported from Belgium and New Zealand. In the early 1960's the company began using butter oil along with fresh cream. Now it is using up to 100 percent butter oil and no cream. In the recent past butter had such a low controlled price that production was halted. When the peso was RD $2.80 to one dollar, the price of butter was set. The dollar then rose to $6.00 pesos to the dollar and production costs of imported materials became higher than the sale price. Butter is still under price control, but the government appears to look the other way and allows producers to charge a reasonable price.

The company produces ten different cheeses, made from milk powder imported from New Zealand, Sweden, France, and Germany. About one-half of the milk used in cheeses comes from these countries in powdered form. In fact, the amount of cheese the company is able to produce is limited by the lack of fresh milk. Only a certain proportion of powdered milk can be used, if exceeded the cheese does not develop correctly. The proportion varies according to the type of cheese. Actual production and sales of cheese has never been equal to the demand but with the increase in demand following the growth of tourism on the north coast, demand outstrips supply. For the last four years the demand has been much greater than sales. The company used to keep a fairly large amount of cheese in storage. Currently they sell all that they produce. There is an unfinished cool room for storing cheese that they realized there was no need to complete.

Milk brought to the company by shareholders and non-shareholders has been declining since 1984 (Table 33).

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Table 33 - Yearly Receipt of Fresh Milk in Pounds

	Shareholders	Non-shareholders	Total
1980	7,522,405	3,439,592	10,961,997
1981	7,470,600	2,396,600	9,867,200
1982	5,424,560	3,192,400	8,616,960
1983	6,372,911	6,760,700	13,133,611
1984	6,308,844	6,604,330	12,913,174
1985	5,424,924	5,728,223	11,153,147
1986	4,385,724	4,722,410	9,108,134
1987	3,604,428	3,950,752	7,555,180

1 liter = 2.2 lbs
botella=1.63 lbs
Source: Productos Sosúa - Author's Fieldwork.

Milk sales to Productos Sosúa declined visibly in recent years, after peaking in 1983. Also, the proportion of shareholder input to non-shareholder input has gone from 3.1 to 1 (75% shareholder to 25% non-shareholder) in 1981 to .91 to 1 (48% shareholder to 52% non-shareholder) in 1987. While the input of milk to Productos Sosúa is not synonymous with production of milk in Puerto Plata, it is a good indicator. What has caused the decline in total milk output? What are the factors behind the shift from shareholders to non-shareholders?

At times it seemed as if the large resort developments such as Perla Marina and Las Lomas were being placed on land that had not previously belonged to anyone. Tongues were tight. Real estate companies were naturally wary of giving out specific information since they operate under the obligation to maintain the client's privacy. Suspicion and secrecy prevent the drawing of a clear relationship between the farmer as a producer and the farmer as a land salesman. Two of the less informative interviewees were dubbed by others as owning "half of Sosúa."

Hypothesis 4 results - Despite difficulties, the general extent of tourism development can be delineated by studying the available land sales data for el Choco, la Bombita and the surrounding areas. Most of the land in la Bombita, waterfront property up

to 7 kilometers from Sosúa, was sold or in the process of being sold. Land in el Choco, farther from Sosúa and inland, was still being used for farming. The increases in land values had not affected this area.

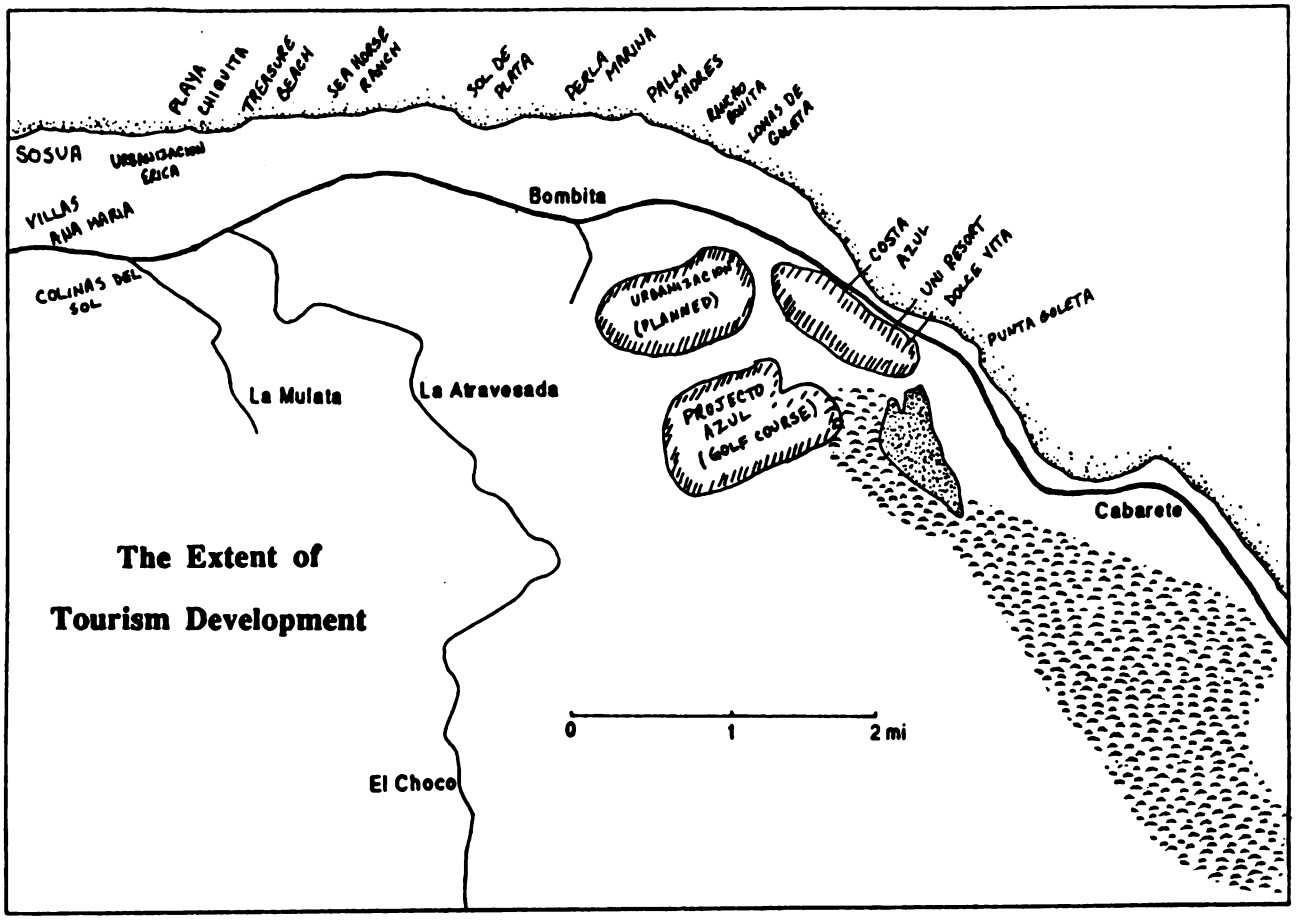

Figure 7 - The Extent of Tourism Development

Interviews revealed the fact that some farms in the area of El Choco area have tended to maintain cattle and dairy operations and were taking steps to supply other goods to tourism. Many of the farms had orange, grapefruit, lemon, and avocado trees growing wild on their property. Several of the farmers were working toward trying to sell both these goods as well as planting new trees.

Of the shareholders and non-shareholders still farming, 100% said that with prices of inputs such as fertilizers and food supplements rising and the controlled price for milk, it was no longer profitable to raise milk cows. Whereas the area had been specializing in milk cows - Brown Swiss and Holstein, they were reverting to the raising of double purpose cattle, and letting the cattle merely graze.

Another important factor in the future of Productos Sosúa is the structure of the company. The shareholders of the company are the original settlers and their descendants. Most of the members interviewed were over the age of 60, some over 75. Many of the descendants have left Sosúa to live elsewhere in the Dominican Republic or have left the country altogether and are living in the United States, particularly Miami. While some would like to continue running the farm, their age has become a limiting factor. They no longer have the stamina to run a farm. In looking toward retirement and providing all they can for their children, they can best capitalize on the tourism boom by selling their land.

Attraction of Labor Out of Agriculture

Hypothesis 5: Tourism in the province of Puerto Plata has not been a significant force in attracting labor out of subsistence agriculture. Based on the statement made by Jaime Moreno, former Dean of Economics at the UCMM (university) and current economic advisor to the minister of tourism, at the Tourism 2000 meeting held at the Radisson hotel in Playa Dorada, on September 20 - 30, 1988, it was hypothesized that with the increase in employment, tourism development has stopped the north coast rural immigration to Santo Domingo.

Dominicans are fairly mobile people. Often children are sent to live with relatives in Santiago or Santo Domingo. A husband may leave his family in Santo Domingo to work in Puerto Plata or vice versa. Many of the workers in Sosúa lived in Puerto Plata, and not all the workers in Playa Dorada were from Puerto Plata.

Based upon figures from the "Encuesta de Migración a Santo Domingo y Santiago, Informe General (Nelson M. Ramirez for the Secretary of the state of public health and social services, 1980), the majority of male migrants to Santo Domingo and Santiago were from the agricultural sector. For Santiago, 30.9% were from within the province of Santiago, 21.3% from Puerto Plata, with the next highest being Valverde at 7.7%. Most of the males going to Santiago were searching for "a better economic situation" 29%, or "a better job" 25%. It remains to be seen, after the next population census, how the rapid growth of tourism on the north coast has affected migration patterns in the Dominican Republic.

Migrants to Sosúa

Hypothesis 5 results - For the 25 employees interviewed, the cities of origin, previous and current residence, and mean years at residence are listed below.

Table 34 - Origin and Residence of Selected Sosúa Employees

	Place of Birth	Previous Residence	Current Residence	Mean years at Residence
Santiago	4	7		
Charamicos (Sosúa)	3	1	15	5.2
San Francisco de Macoris	1	1		
Nagua	1	1		
Puerto Plata	6	6	9	10.4
Haiti	2	2		
Sabaneta	1	0	1	18.0
Gaspar Hernandez	2	1		
Moca	3	3		
Rio San Juan	1	1		
Santo Domingo	1	2		
Total	**25**	**25**	**25**	**11.2**

Table 35 - Employee Migration Responses

Why did you leave your previous residence?

Reason	Percentage
Insufficient wage to support family	9
Not satisfied with job	9
To find better work	30
To find a better economic situation	30
To accompany family	22

Why did you come to Sosúa?

Reason	Percentage
Affordable living	
Opportunity	56
To be with family	16
Better work	12
Better pay	16

Santiago and Puerto Plata were the most frequent origins as well as previous residences of the sampled population. Of those people that had relocated to the area, nine percent indicated they left their previous residence due the insufficient wages. Nine percent indicated they were not satisfied with their previous job. Sixty percent left to find better work or a better economic situation. Twenty-two percent listed "other" reasons. The overwhelming response to the reasons for choosing Sosúa as a place of residence was general opportunity (56%).

In terms of having worked in agriculture, eight of the twenty-five people interviewed (32 percent) had at some time worked on a farm. All the farms were within the five north coast provinces. Only two of the respondents continued to assist relatives on the family farm. This percentage of workers having been involved in agriculture is less than found for migrants to Santiago which was greater than 50 percent (Ramirez, 1980).

The previous migration patterns of all the workers were as follows. Fourteen people were from the north coast area and had not previously left, five had migrated to Santiago or Santo Domingo (4 and 1 respectively) and come back, two came directly from Haiti, three from Santiago, and one from Santo Domingo. Thus, we see the majority were from within the north coast (19 people or 76 percent). The ministry of tourism's claim that tourism has

stemmed migration to Santiago and Santo Domingo is supported by both this figure and the return of 20 percent of the workers who had come back from the two cities.

Farm employers within Sosúa

Hypothesis 6: The growth of tourism in the province of Puerto Plata has had a significant effect on the ability of cattle farmers in the town of Sosúa to attract and retain employees.

Hypothesis 6 results - Based upon responses of middle to large scale cattle farmers in the area, tourism was found to be a significant force in attracting labor out of agriculture. All of the respondents (milk and beef producers, members and contributors to Productos Sosúa) who were still in farming at the time of the interview or who had left farming within the last three years, stated that difficulty in finding and keeping labor was a major problem. They also stated unanimously that problems in attracting labor began in 1986. At this point it can be said that tourism had reached the involvement or development stage as presented by Butler (1980). This is manifested in the emergence of a seasonal pattern with tourists securing travel arrangements through agencies as well as the development of a well defined tourism market area. One resort owner referred to the year 1986 as the turning point, when American Airlines began regular service to Puerto Plata.

The salaries offered employees ranged from the minimum wage of $350.00 to $550.00 pesos monthly. This is less than can be earned working for a tourist enterprise, but it does include room and board. The most frequent reason given for the difficulty in attracting and keeping labor was that farming is difficult work and that workers would rather drive a *moto* taxi.

Haitian labor is relatively abundant in the Dominican Republic. Allowed into the country to work on sugar cane fields, they can also be seen working on farms and in construction in large numbers. Some farmers were employing Haitians while several noted with dissatisfaction that "Haitians are even more difficult and undependable than we Dominicans."

CHAPTER 6
SUMMARY, CONCLUSIONS, AND COMMENTS

Summary and Conclusions

In this thesis I have tried to illustrate the interrelationships between tourism and agriculture as well as the dynamics of tourism food supply on the north coast of the Dominican Republic. A goal of the thesis was to discuss the effect of tourism on agriculture in its many ways, stressing both positive and negative aspects associated with tourism promotion and growth.

Food Supply

To briefly summarize the results, it was found that the supply patterns for fruits, vegetables, meat, poultry, and fish were significantly different for Sosúa restaurants than hotels in Puerto Plata. This is important since one of the goals of tourism is to generate employment and income, not only directly in the tourism industry but also indirectly in other sectors of the economy. Based on previous literature, linking import content to hotel size, it was expected that the smaller scale hotels in Sosúa would import less foodstuffs than the hotels in the Playa Dorada complex that were larger scale operations. However, instead of foodstuffs being imported, as found for the other smaller islands in the Caribbean, in the Dominican Republic, the items are grown or raised within the country (with seafood being an exception). The difference found between supply patterns for large and small scale operations in the Dominican Republic was that the large scale hotels at Playa Dorada were more reliant on food sources outside the province of Puerto Plata than were the smaller operations in Sosúa. Hence, while the indirect benefits to tourism are staying within the country, the smaller establishments within Sosúa (as well as the local population) have a relatively more significant impact on local food markets.

Local markets had indeed responded to the growth of tourism in the area. All of the fruit and vegetable markets contacted stated that their businesses had at least doubled in size

since 1984. The public market in Puerto Plata primarily served residents of the growing city and restaurants in Sosúa, and was supplied mainly through intermediaries coming from the market in Santiago. Silverio Messon, a wholesaler in Puerto Plata secured fruits and vegetables from both the Santiago market and directly from Constanza. The trips to Constanza began in 1985. The wholesaler's operations were mainly sales to restaurants in Puerto Plata and hotels in Playa Dorada and Sosúa, though they did sell directly to the public. The small market in Sosúa dealt directly with tourists at inflated prices and bought from the market in Puerto Plata while Mario's market in Sosúa not only sold directly to tourists and restaurants but also branched out and takes orders from restaurants, delivering the fruits and vegetables.

As mentioned in Chapter 3, there was one major attempt to produce the fruits and vegetables demanded locally by the tourism industry that met with failure. A local agricultural student informed me that the farm's first harvest was in 1986. It was mildly successful, but the second year the lack of rain and no irrigation system on the farm lead to an unsuccessful crop. The project was then abandoned. There were other recent attempts to change crop production. Some of the members of Productos Sosúa are devoting portions of their farm land to growing fruits and vegetables. One member, who also owned several hotels, recently had planted 100,000 pineapple plants, 200,000 orange trees, as well as various other fruits. Another member had conducted an extensive analysis of his property's soil, slope, water availability, and drainage conditions on two of his farms and was carefully planning the introduction of new fruit and vegetable plants (there were already many growing wild) as well as highly efficient trees to produce lumber for building. This farmer was particulary disturbed by the lack of coordination among the farmers in the area. He had plans to form a cooperative in order that farmers could sell their goods directly to local markets or citizens.

Several factors can be cited to support the finding that the tourism industry on the north coast does not import a large portion of its foodstuffs from abroad as done by many

other Caribbean nations. Firstly, the Dominican Republic is larger than the islands studied by Alleyne (Barbados), Belisle (Jamaica), and O'Loughlin (Antigua). Climate and soil conditions on the north coast are suitable for citrus crops, and the growth of vegetable crops in the highland valleys of Constanza and Jarabacoa has expanded to keep pace with growing demand. Secondly, government policy governing food imports, restricted imports to food items that were not available locally. Finally, the size and growth rate of the tourism industry (Alleyne, 1974) affects and will continue to affect the future of food supply to the north coast. The present government policy inhibiting imports may change as the industry grows rapidly.

It appears as if tourism is growing too fast for its own good on the north coast. Hotel managers in Playa Dorada were disturbed at the inflated food prices and possibilities of shortages. The increased demand for seafood due to tourism has become increasingly difficult to fulfill through local sources. In mid-September 1988, President Joaquin Balaguer ratified a document eliminating all import duties on seafood for hotels and restaurants affiliated with the National Association of Hotels and Restaurants (Asonahores) on the north coast, in order to insure an adequate supply for the upcoming high season. The document assigned yearly quotas ranging from 2,000 pounds to 45,000 pounds for Eurotel Playa Dorada, the largest hotel on the north coast.

The president of Asonahores, the influential force in creating the document, indicated that the association would aid in locating suppliers, and that currently other hotels within the nation import seafood from Spain through a supplier in Puerto Rico. The organization also indicated that its next step would be to lobby for tax exemptions for the importation of beef and wines, thereby permitting the provision of a greater variety and quality of food to visitors (El Faro, September 30, 1988).

Competition for Land

For many islands of the Caribbean, agriculture is not in direct competition for land from tourism, since the coastal land surrounding tourism centers is often not suitable for cultivation. However, on the north coast, tourism has had a marked effect on the competition for land between tourism and agriculture. For example, the Dominican government was in the process of selling sugarcane fields to tourist enterprises to aid the failing sugar industry. In Sosúa, aging cattle farmers, with no heirs to run their farms have been hard hit by peso devaluations. Also, increased production costs encouraged them to sell their farms to developers. The extent of the farm sales at the time of this fieldwork, was along the waterfront area up to 7 kilometers from Sosúa (Figure 7). Beyond this point, and further inland, tourism's affect on the demand for land and land values had not been felt. Other farmers in the area whose farms have not yet been affected by the increase in land prices, or who prefer not to sell out to tourism, attempt to take advantage of the tourist market by growing fruits and vegetables for consumption in Sosúa or by producing beef cattle, less expensive to raise than dairy cattle.

Labor and Migration

As found by O'Loughlin in Antigua, tourism is attracting labor out of agriculture. Farmers in the area have experienced severe difficulties in finding and keeping laborers to work on their farms, since workers can work less and earn more in tourism related occupations.

However, migration of men and women from outside the north coast to Sosúa did not appear to be pronounced. Over 50 percent of the employees interviewed had come from within the three north coast provinces. Some 32 percent had farming experience while 8 percent continued to help out on the family farm. The government's claim that the increased opportunity on the north coast has lessened rural migration to Santiago and Santo

Domingo cannot be tested with the available data, though it was found that five of the respondents had returned to the coastal area after migrating to Santiago or Santo Domingo.

Data Collection Problems

While my stay in the D.R. was certainly an enjoyable one and the experience of conducting thesis research generally positive, I would like to cite several factors limiting the scope of this analysis. First is the serious lack of statistical information; What was, and is, available is outdated or "hidden." The Dominican Character and concept of time were also stumbling blocks. One of the most ironic things I read while in the country was a plaque outside the library at the UCMM in Santiago. It said "Aprovecheemos el tiempo", which means, "let us use our time wisely." The Dominican and the American concept of time are not the same. People would often show up late for a scheduled meeting, or not at all. Generally people were hesitant to make appointments since "one can never be certain" what would come up.

Also, suspicion was a problem. I was jokingly accused of being a CIA agent more than once. I found that the length of my questionnaire was inversely related to the amount of information that interviewees were willing (and in many cases able) to give. Generally the hotels and restaurants provided information, although many of the food and beverage managers did not have the time to fill out the questionnaire. Several copies were lost or "filed." Frequently, I was able to go through "the books" myself.

Some store owners/vendors were unwilling to give information fearing that in some way it might be used against them. As to be expected, some of those interviewed were direct and concise, while others tended to "beat around the bush" and were unwilling to divulge certain information. Members of Productos Sosúa, all gracious and friendly, were more than willing to speak in general terms such as "all one needs to do is work hard to

succeed," and "profit has gone down," but when it came to their specific actions and intentions involving their land, their tongues tightened.

Although, I was unable to find a map of the municipality of Sosúa or even a record of its size, I finally did secure a topographic map at the Secretary of Tourism's office in Santo Domingo. I was able to trace it since the photocopy machine for the agency was not functioning.

The prospect of tracing the food supply system beyond the local markets was beyond the scope of this thesis. Increased demand also causes increased employment in agriculturally related enterprises such as the transporting goods from the farm to the market. But, as found by the Banco Central (1981) study, marketing and commercialization systems are elaborate and complex. It is difficult to quantify the increase in number of middlemen who transport goods directly to hotels or to local markets in Sosúa and Puerto Plata from the farm or from the central market in Santiago. There is no "definite" number of people employed in this occupation, and no attempt to quantify them was made. Discussion with middlemen proved to be of little value since their answers were unspecific and unreliable. They, after all, were not the producers.

It might have been useful to study the effect of increased demand during the tourism high season on the prices of agricultural goods as well as the increase in prices as the goods made their way through the marketing system. It was thought that the incentive for the individual farmer to increase production was relatively low due to low prices paid the producer. As can be seen for the rest of the Dominican Republic, retail prices were often 300 percent higher than the price paid on the farm. The instability of prices for many fruits and vegetables (depending on size, quality, relative scarcity due to natural conditions, seasonality, or the amount being purchased) made it impossible to develop a significant relationship between demand and price increases.

An attempt was made to determine from local vendors the source area for fruits and vegetables. Although it was not possible to directly discuss with farmers any possible

attempt to meet the demands of tourism, it was felt that gaining an idea of where the products were coming from was a good first step and valuable information to better understand the effect of tourism on agriculture. To this end I was able to exact some information out of vendors in Puerto Plata and more easily extract information from Silverio Messon.

Information from the Banco Central study and Government technical documents helped determine the importance of the Constanza valley area as a supplier of vegetables to the north coast.

Final Comments

While it was repeated many times from the members of Productos Sosúa and university professors to hotel managers and subsistence farmers, that the possibilities for agriculture in the Dominican Republic are encouraging, progress often seems out of reach. One factor constraining agricultural growth which is not dealt with directly in this thesis is that of uncoordinated private and public institutions.

There are eighteen public sector agencies and nine private institutions involved with the environment and natural resources in the Dominican Republic. Virtually every natural resource sector has more than one primary government agency, hence there is considerable duplication of effort and programs. Furthermore, there appears to be considerable inter-agency jealousy. Even worse, some institutions have similar programs with little substantive exchange of information. There is little participation of the private sector in the public arena and no real coordination (Hartshorn, 1980).

The two government bodies in charge of handling tourism development, the Secretaría de Turismo (SECTUR) and Infraestructura de Turismo (INFRATUR) to a large degree do not cooperate. INFRATUR, a branch of the Banco Central, is technically under the jurisdiction of SECTUR, but has essentially been involved in Playa Dorada, Playa Grande, and overseeing development on the north coast without interaction with SECTUR.

For the past few years, INFRATUR, as well as representatives of other institutions (private and public) related to the tourism sector have stimulated small, medium, and large scale development in Puerto Plata, based on the expectation that the tourist demand will continue to increase and the tourist population will continue to expand. However, the attempts to stimulate public investment in agriculture will continue to meet with two basic problems. In the first place, the financial institutions that channel credit to agriculture do not necessarily share the development strategy sought by INFRATUR. In many cases, they were not informed of INFRATUR'S projects and the role they would eventually play to finance the projects. This suggests that it is in INFRATUR's best interest that the needs of agriculture and the financial stimulation needed by agriculture are communicated to credit institutions in the region.

Furthermore, even if the financial institutions are informed it remains to be seen to what extent the credit demanded by agricultural enterprises in the region will be provided since scarce credit will logically be oriented toward areas of higher profitability and not lower profitability agriculture. As stated in the Banco Central study (1981), many of the vegetables are coming from the valley of Constanza. With the government and private sectors investing in irrigation projects in this valley, where soil and temperature conditions are ideal for growing vegetables, the importance of Constanza as a supplier of vegetables to tourist enterprises will continue. In November of 1988, the governments of Japan and the Dominican Republic signed an agreement to launch a joint agricultural and hydroelectric project in Constanza at an estimated investment of RD $75 million (U.S. 11.4 million). The project's aim is to put 32,000 tareas into production supplying one cubic meter of water per second for every 16,000 tareas under cultivation.

Finally, it is difficult to measure the changes that tourism is inducing on the north coast. As stated by one employee of SECTUR, "the Dominican Republic is not a land of numbers." My contact in the department of economics at the Universidad Católica Madre y Maestra lamented that it is hard to find information and that the numbers are often

inaccurate. Thus, the large scale effects of tourism on land use on the north coast were impossible to determine. But, it is hoped that the findings presented in this thesis will help further the understanding and progress of development on the north coast.

Appendices

Appendix A

Food Quantity and Supply Questionnaire

I. Background

1. Name and position of interviewee_____

2. Name of hotel or restaurant _____

3. Location _____

4. Size of hotel (# of rooms) _____

5. Size of restaurant _____

6. Room rates (hotel class) _____

7. Years in operation of hotel / restaurant _____

8. Ownership of hotel/restaurant (foreign vs. local)_____

9. Percentage of tourists frequenting restaurant _____

II Supply of foods for 1988.

A. Fruits and vegetables (fresh and frozen)

1. Quantity

a Vegetables

Name	Month J	F	M	A	M	J	J	A	S	O	N	D
Lechuga (Lettuce)												
Papa (Potato)												
Tomate Barcelo (Plum Tomato)												
Tomate Ensalada (Salad Tomato)												
Repollo (Cabbage)												
Apio (Celery)												
Zanahoria (Carrot)												
Yuca												
Brocoli												
Pepino (Cucumber)												
Coliflor (Cauliflour)												
Platano												
Tayota												
Aguacate (Avocado)												
Remolacha												

Molondrones

Vainita

Berengena

Auyama

Batata

Zapote

Ajo
(garlic)

Yautia

Puey

Puerros

Cilantro

Perejil

B. Fruits

Name	Month J	F	M	A	M	J	J	A	S	O	N	D
Toronja (Grapefruit)												
Naranja/China (Orange)												
Mandarina (Mandarin Orange)												
Piña (Pineapple)												
Guineo (Banana)												
Lechosa (Papaya)												
Sandia/Pastilla (Watermelon)												
Limon (Lemon/Lime)												
Chinola (Passionfruit)												

Mango

Coco
(Coconut)

2. Supply

Name / Goods Supplied/ Delivered or to market / Number of visits/
of Supplier / Location. Have you changed your methods of supply since beginning operation of the restauraunt? If so, how?

C. Meat and Poultry

1. Quantity

Name	Month J	F	M	A	M	J	J	A	S	O	N	D
Carne Buena (Beef-Prime)												
Carne Molida (Ground Beef)												
Pollo (Chicken)												
Jamon (Ham)												
Tocineta (Bacon)												
Pato (Duck)												
Cabra (Goat)												
Oveja/Chivo (Lamb)												
Cerdo (Pork)												
Pavo (Turkey)												
Ternera (Veal)												

2. Supply

Name / Goods Supplied/ Delivered or to market / Number of visits/
of Supplier / Location Have you changed your methods of supply since beginning operation of the restauraunt? If so, how.

_____

_____

_____

_____

_____

_____

D. Seafood

1. Quantity

Name	Month J	F	M	A	M	J	J	A	S	O	N	D
Mero (Sea Bass)												
Camarones (Shrimp)												
Langosta (Crab)												
Langostino (Lobster)												
Chillo												
Carite												
Pulpo (Octopus)												
Ostiones (Oysters)												
Bulgao												

2. Supply

Name / Goods Supplied/ Delivered or to market / Number of visits/
of Supplier / Location. Have you changed your methods of supply since beginning operation of the restauraunt? If so, how?

_____

_____

_____

_____

_____

_____

_____

_____

E. Dairy

1. Quantity

Item	Month J	F	M	A	M	J	J	A	S	O	N	D
Mantequilla (Butter)												
Queso Danes (Cheese-Danes)												
Mozarella												
Huevos (Eggs)												
Helado (Ice Cream)												
Leche (Milk) Quartillo (Quart)												
Leche (Milk) Polvo (Powder)												
Crema de Leche (Heavy Cream)												

2. Supply

Name / Goods Supplied/ Delivered or to market / Number of visits/ of Supplier / Location. Have you changed your methods of supply since beginning operation of the restauraunt? If so, how?

Appendix B

Sosúa Employee Survey

1. Occupation_____
2. Place of work _____
3. Place of Residence_____
4. Number of years at reşidence or in area _____
5. Sex M____ F____
6. Place of Birth_____
7. Date of Birth _____
8. Previous residence _____
9. Previous Occupation _____
10. Marital Status _____
11. Who came with you ? _____
12. Why did you leave?
    1. Insufficient wage to support family
    2. Not satisfied with job
    3. To find better work
    4. To find a better economic situation
    5. To accompany family

13. Why did you choose here?
    1. Affordable living
    2. Opportunity
    3. To be with family
    4. Better work
    5. Better pay

14. In any place where you have lived, including your place of birth, have you ever worked in agriculture or on a dairy/cattle farm? _____
15. If yes, where do you or have you done this activity? _____
16. Are you currently participating in this activity? _____
17. Education level _____
18. Monthly salary _____

Appendix C

Productos Sosúa, land use changes

Interviews with the members of Productos Sosúa were conducted in an informal manner. Members were asked certain leading questions and would often continue with their own line of thought. Ultimately the questions listed below were answered.

1. Name _____

When did you come here?

How much land were you given?

Where was the land located?

How many cattle did you have when your farm was operating at its peak?

When was this?

How many in 1980?

How many today?

How much milk did you produce when your farm was operating at its peak?

When was this?

How much in 1980?

How much today?

How many people did you employ when the farm was operating at its peak?

How many today?

How much do you pay your workers?

Have you had difficulty finding labor?

Do you still own all the land?

Have you bought more land?

Have you sold land? When? Why?

Who did you sell to? As a farm?

Has it continued to be operated as a farm?

Have you done anything to develop the land?

Have you made any attempt to sell products to tourism directly?

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