

SEASONAL MIGRATION, THE FARM-HOUSEHOLD ECONOMY
AND
NUTRITION IN RURAL JAMAICA

by

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Dedicated to my mother
Georgine Elfride Dankerlin
and to my late father
Nicolas H. G. Dankerlin

PREFACE AND ACKNOWLEDGEMENTS

I was drawn to the study of labor migration because it illuminates the process of social change more than most social phenomena. I also had a personal interest in the subject matter, which stemmed from my background as a West Indian, born in Suriname.

Twenty years after slavery was abolished in 1863, my maternal grandfather, still a toddler, became a young migrant when he was strapped onto his father's back and taken from a small farm near Waterloo plantation into the interior of western Suriname, where my great-grandfather owned a lumber concession company. In 1917 my father was sent to Holland by his father for further education in engineering, only to become an organizer of one of the unions of the American Federation of Labor in New York in the 1930s. My mother met my father in the United States, where she travelled in the 1940s to negotiate with American firms which imported natural rubber from her father's company in Suriname. As young adults, in the late 1960s and early 1970s my cousins and I were also sent abroad from Suriname by our parents. My cousins left for the Netherlands, while I chose to return to the United States where I had spent some years as a child.

The two years I lived in Jamaica were invaluable to my understanding of the process of household and individual decision-making and of labor circulation between the West

Indies and the United States. It has convinced me that we can only fully comprehend the dynamics of migration when we have actually lived in migrants' communities over an extended period of time.

The challenge of this regional study was that I needed to spend sufficient time in each community to understand its political and social dynamics. This led to my being made a "part" of these communities over time. Being incorporated into a group of communities means that one is "assigned" a role. My functions were to provide transportation between communities and when asked, to act as a liaison between health care professionals and the people, bridging as it were a spatial as well as a socio-economic distance. This, in turn, enabled me to become acquainted with a far greater number of people in these communities than I otherwise would have.

There is, unfortunately, a paucity of research at the regional level in Jamaica. From the point of view of migration, research on Jamaica has focused on the individual or household level and at the national level. By including an analysis of the effects of migration on a homogeneous population from a regional level as well, I was able to trace different production and consumption patterns at the household level. Moreover, networks between communities

through extended families, schools, regional sports tournaments, the juridico-political structure, and regional markets form an integrated system. This kind of research provides a basis for fine-tuning social and economic policy to the specific needs of a rural population.

A project of this nature entails the cooperation of a large number of dedicated people. I wish to, therefore, take this opportunity to thank them individually. At this juncture, I will express my gratitude and appreciation to the following members of my dissertation committee. My thanks to my advisor, Professor Lisa Peattie, who first introduced me to the subject of rural undernutrition prior to migration and to the study of household economics. My sincerest thanks to Professor Nevin Scrimshaw, whom as Director of the Harvard-MIT International Food and Nutrition Program, gave his assistance in helping to fund and organize the research project, visiting the country personally on one occasion. I sincerely appreciate his guidance and continued support of my research and my studies over the years both at MIT and at Harvard. My sincerest thanks to Professor Martin Diskin, for encouraging me to pursue the study of economic anthropology, for his insights into the research design and overall analysis and for his support. I wish to give special recognition to the important contribution of Professor

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My special thanks to Dr. David Griffith and to Professor Charles Wood of the University of Florida for their comments and advice when I started the field research. The comments of Professor Oded Stark of Harvard University during various stages of the research were very helpful and I also thank Professor Myron Weiner of MIT for information as I explored the subject. I also wish to acknowledge the contribution of Professors Victor Piché and Joel Gregory of the University of Montreal, during the preliminary stage of my research. My thanks to Dr. Chris de Beet of the University of Utrecht who, while in Jamaica, gave very helpful comments in the final stage of my field research. I am very grateful to Professor Glenn Jenkins of Harvard University for his comments on the benefit-cost approach and for his support in the final phase of the study, after I returned from Jamaica. My thanks to Dr. Michael Bamberger of the World Bank for his comments.

I wish to thank the United Nations University and the Social Science Research Council for funding this research. I wish to also thank the staff of the Pan American Health Organization and their Caribbean Food and Nutrition Institute

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It was difficult witnessing the indignity of poverty many families had to endure. In spite of their hardships, they shared whatever little they had with me, even their young children showed a great deal of interest in my well-being. In those instances when they had doubts, families still participated in the study because they felt it would help me further my education.

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CONTENTS

	Page
.....	
ABSTRACT.....	i
PREFACE AND ACKNOWLEDGEMENTS.....	ii
PART I.....	1
Chapter 1: INTRODUCTION.....	1
1.1 Aim of Research and Major Questions.....	1
1.2 Major Issues.....	3
1.3 The Household Economics Perspective.....	11
1.4 Conceptual Framework.....	17
1.5 Questions to be Examined.....	21
1.6 A Note on Organization.....	25
Chapter 2: RESEARCH DESIGN AND METHODS.....	27
2.1 General Organization.....	27
2.2 Design.....	28
2.3 Methodology.....	33
Chapter 3: REGIONAL ECONOMY AND AGRARIAN POLITICAL ECONOMY.....	45
3.1 Introduction.....	45
3.2 Historical Demography.....	45
3.3 The Racial and Cultural Background of the Peasantry.....	50
3.4 The Region.....	51
3.5 Patterns of Land Distribution and Settlement.....	54
3.6 Recent Economic Trends in the Region.....	56
3.7 Peasant-State Relations.....	57
3.8 The Socio-Political Structure and Forms of Integration.....	59

Chapter 4: FARMING AND AGRARIAN LIFE.....	64
4.1 Physical Geography.....	64
4.2 Production: The Annual Agricultural Round.....	67
 PART II FARM-HOUSEHOLD RESOURCES.....	 89
INTRODUCTION: THE ANALYSIS OF HUMAN RESOURCES AND LAND.....	89
 Chapter 5: POPULATION.....	 91
5.1 Population Size and Structure.....	91
5.2 Comparison of Births and Deaths.....	91
5.3 Household Size and Composition.....	94
5.4 Marital Patterns.....	106
5.5 Domestic Development Cycle.....	107
5.6 Migratory Trends.....	107
5.7 Effects of Migration on Technical Innovation.....	112
5.8 Summary Analysis.....	113
 Chapter 6: LAND.....	 117
6.1 Land Size and Tenure.....	117
6.2 Land Inheritance.....	120
6.3 Land Purchasing Patterns of Farm-households.....	121
6.4 Summary Analysis.....	129
 PART III MIGRATION AND THE FARM ECONOMY.....	 131
 Chapter 7: AGRICULTURE.....	 133
7.1 Agricultural Diversity.....	133
7.2 Gross Output, Sales and Consumption.....	136
7.3 Factors Affecting Staples Output.....	137
7.4 Inputs.....	138
7.5 Extra-household Labor.....	142
7.6 Regression Analysis of Agricultural Output.....	146

7.7	Regression Analysis of Staples Output.....	154
7.8	Changes in Cultivation.....	156
7.9	Specialization and Diversification.....	158
7.10	Summary Analysis.....	160
Chapter 8: LIVESTOCK.....		164
8.1	Gross Livestock Output and Sales.....	164
8.2	The Role of Livestock in Household Maintenance and Reproduction.....	168
8.3	Summary Analysis.....	175
PART IV INCOME AND WEALTH AND THE WELFARE OF WOMEN AND CHILDREN.....		178
Chapter 9: INCOME AND WEALTH.....		179
9.1	Farm-household Income.....	179
9.2	Migration Income and Its Disposal.....	181
9.3	Cash Savings.....	183
9.4	Wealth (Assets).....	183
Chapter 10: MIGRATION, FARM-HOUSEHOLD ECONOMICS AND THE WELFARE OF WOMEN AND CHILDREN.....		185
10.1	Levels and Patterns of Consumption.....	185
10.2	Farm-household Time-Allocation.....	193
Chapter 11: FOOD EXPENDITURES AND NUTRITIONAL STATUS.....		196
11.1	Annual Food Expenditures.....	196
11.2	Methodology/Nutritional Status Appraisal.....	202
PART IV: SUMMARY ANALYSIS.....		209
PART V.....		220

Chapter 12: CONCLUSION.....	220
12.1 Effects of Migration on Farm Production.....	220
12.2 Economic Behavior of Migrant Households.....	220
12.3 International Labor Migration and the "Welfare Contract".....	224
 BIBLIOGRAPHY.....	 226
APPENDIX A: Tables 1 - 32.....	242
APPENDIX B: Agriculture.....	282
APPENDIX C: Interview Schedules 1 - 2.....	299

PART ONE

Chapter 1

INTRODUCTION

1.1 Aim of Research and Major Questions

Our inquiry is intended to identify the effects of seasonal male emigration on the farm economy, and its direct as well as indirect effects on the access to resources and welfare of farm-households. The major questions are the following. How do we define "effects?" What are the allocational and distributional aspects of emigration from a third world region? Is there any benefit to rural household and family units from circular migration of male heads between developing and advanced industrialized countries? If so, who benefits within the household, in what specific ways does (s)he benefit, and what are the institutional mechanisms which mediate these benefits? Would there be a temporal component to these benefits and how would it be interpreted?

We examine these questions in the context of a regional rural Jamaican economy. The setting for this study is the western part of the parish of St. Thomas. St. Thomas borders the parishes of St. Andrew and Portland, and is located in

the southeastern corner of Jamaica. The participants in this research are Jamaican men who are contract laborers in the British West Indian (BWI) Alien Labor Program, and the women and children who make up their households. These men are small farmers while in Jamaica for half of the year, spending the other half in the United States, mainly in Florida as sugar-cane cutters. They are generally away from their farms between September to March. This conflicts with the peak labor demand season in agriculture in Jamaica.

The total number of men in this program in the 1986-87 season, who came from the research area was approximately one hundred or about 2 percent of the total estimated population of 4900.¹ Each farm-household contains about 5.7 individuals.² We therefore estimate that approximately 570

1 We use an approximate, since some men returned due to the strike in the 1986-1987 season. We are uncertain as to the number of men who were sent in their place. 1980 Jamaica Population Census.

2 A projection based upon our stratified random sample of sixty-two households, containing 367 individuals (see Table 3). lines, with migration classified as being either "beneficial" or as "detrimental," by the neo-

individuals, or 11.6 percent of the population, were directly affected by this migration.

1.2 Major Issues

The problem of the benefits to agriculture, to rural families and communities of out-migration from rural areas, and the broader issue of whether this is a process which leads to economic development or to stagnation in the developing world, has engendered considerable controversy over the past twenty-five years. This debate has run fairly consistently along ideological

Proponents of international migration see it as a way of relieving regions with a labor surplus, which allows wage rates to rise in departure zones and to fall in receiving zones, which have a labor shortage. Agricultural productivity in home communities increases, as migration stimulates innovation and investment in improved technology. Income earned by migrants and sent home in the form of cash remittances or savings (see below) improve the foreign

classical/modernization school of thought and by its critics, respectively.

exchange balance of the country of origin. Consumption of domestically produced commodities increases as migrants and their families purchase more consumer items. Leading exponents of this viewpoint include Todaro, Byerlee and Cornelius.³

Critics of this approach can be broadly defined as "structuralists." At the macro-level, these scholars view migration as an expression of the unequal exchange relationship between politically powerful advanced industrialized states and poor underdeveloped, politically weak nations. The unequal balance of power is replicated in political and economic relationships at the national level,

3 M. Todaro, "Income Expectations, Rural-Urban Migration and Employment in Africa," *International Labor Review*, Vol. 104, pp. 387-413.

D. Byerlee, J.L. Tommy and H. Fattoo, "Rural-Urban Migration in Sierra Leone: Determinants and Policy Implications" *African Rural Economics Paper*, Vol. 13, 1976.

W.A. Cornelius, "Outmigration from Rural Mexican Communities." In *The Dynamics of Migration*, International Migration Interdisciplinary Communications Program, Occasional Monograph Series Vol. 2, No. 5, Smithsonian Institution, 1976.

with poor underdeveloped, mostly rural, regions economically dependent upon urban national capitals who control and benefit economically from the labor of international migrants through foreign exchange earnings, without reinvesting in rural sending communities. Agriculture declines and rural areas are impoverished as young able-bodied workers leave, most of whom are men. The human capital investment (education) of the country of origin is lost to the receiving country, who gains the most energetic workers.

Scholars critical of migration include notably Meillasoux, Portes, and Reichert.⁴ McKoy and Wood, and Griffith⁵ are among the major scholars critical of the

4 C. Meillasoux, *Maidens, Meal and Money: Capitalism and the Domestic Community*, Cambridge University Press, 1981.

A. Portes, "Migration and Underdevelopment," *Politics and Society* 8, pp. 1-48, 1978. See also J.S. Reichert, "The Migration Syndrome: Seasonal U.S. Wage Labor and Rural Development in Central Mexico," *Human Organization* Vol. 40, No. 1, 1981.

5 T. McKoy and C. Wood, *Caribbean Workers in the Florida Sugar Cane Industry*. Occasional Paper No. 2, Caribbean Migration Program, University of Florida, Gainesville, 1982. See also D. Griffith, *The Promise of a Country: The*

effects on rural Caribbean communities of the circulation of men who work as migrant farm laborers in the United States.

Remittances lead to inflation and higher land and housing prices. Land which is purchased is left unproductive, further decreasing the availability of arable land in areas with high exacerbate rural inequality by enriching a select few. New technologies introduced as a result of migration are labor-saving, and only serve to increase rural unemployment.

Ultimately, any benefits to the country of origin are simply short-term in nature. The social ties which migrants who are abroad maintain with their home communities tend to weaken over time, with a concomitant curtailment in the schedule and size of remittances. In any event, this benefit-cost approach merely leads to policy recommendations which minimize costs and enhance benefits, while maintaining a fundamentally inequitable system.⁶

Impact of Seasonal U.S. Migration on the Jamaican Peasantry, Ph.D. Dissertation, Department of Anthropology, University of Florida, 1983.

⁶ The benefit-cost analysis of migration is regarded as a structural-functionalist approach. Comprehensive analyses

This model of migration as a consequence of unequal exchange and dependent relationships has been elaborated in the Caribbean context, through the "plantation economy" model.⁷ In this paradigm, the effects of migration on agriculture are due to the predominance of the plantation economy. Girvan explains that after the slaves were emancipated in Jamaica, the plantation economy inhibited the expansion of a true peasantry and domestic agriculture, by controlling the best land and the allocation of agricultural inputs, extension research and markets. Richardson argues that in St. Kitts and Nevis, and in the Caribbean as a whole,

of these theoretical perspectives are made by M.Weiner, "International Emigration and the Third World" in W. Alonso, (ed.) Population in an Interacting World, The World Bank, 1985, and can also be found in W.M.J. van Binsbergen and H.A. Meilink, Migration and the Transformation of Modern African Society. African Perspectives 1, University of Leiden, 1978.

⁷ (7) G.L. Beckford, Persistent Poverty, Underdevelopment in Plantation Economies of the Third World, Oxford University Press, 1972.

plantation crops caused a deterioration in soil fertility.⁸ The culmination of these effects has been that smallholders have been unable to survive without some kind of wage labor. Migration has therefore been the only option in rural areas, where opportunities for wage employment are severely restricted; and international wage labor the only alternative in small Caribbean countries with high unemployment.

At the micro-level, critics have focused on the issue of "productive investments" versus the "consumption-orientation" of migrants and their families. Although some do concede that migrants themselves may gain, concern over the social costs of migration (i.e., loss of national production, greater inequality of income distribution), has resulted in a focus on the ways in which private gain has been used.⁹

⁸ N. Girvan, "The Development of Dependency Economics in the Caribbean and Latin America" Social and Economic Studies Vol. 22, No.1 (March 1973), pp. 1 - 33.

B. Richardson, Caribbean Migrants, Environment and Human Survival on St. Kitts and Nevis, University of Tennessee Press, 1983.

⁹ See D. Griffith, "Women, Remittances and Reproduction" American Ethnologist, Vol. 12, No. 4, 1985, and C. Myntti,

They observe that individual and household expenditure patterns reflect increased purchases of imported western consumer items like radios and television sets. Migrants' families also spend money on new housing. Food purchases increase while food production declines. Education of children is also seen as a form of consumption.

In the meantime, agricultural investment and technology remain the same, returns to investment remain low and agricultural development stagnates. Critics conclude that migrants maintain a high level of consumption at the expense of long-term investment. Welfare may increase but socio-economic status does not.¹⁰ Migration has, at best, no effect on the household. It is simply a survival strategy used by farm-households, some of which focus on farming, others combining farming with wage work.

"Yemeni Workers Abroad: The Impact on Women," MERIP Reports, Vol. 124, No. 14, 1984.

¹⁰ I. Palmer, The Impact of Male Out-migration on Women in Farming, Kumarian Press, 1985.

A fundamental problem lies in the definitions of "productive" and "unproductive" effects. "Productive investments" and "productivity" tends to be defined by migration theorists in general, in terms of agricultural productivity. Agricultural productivity and returns on agricultural investment are the main criteria used for evaluating the success of migration, while all other expenditures tend to be classified as consumption. Often, this is assumed to be synonymous with nonproductive expenditures, including expenditures on education.¹¹

Production-oriented measures are useful tools for assessing migratory effects, and are used in some degree by peasant farmers themselves. However, the interpretation of these measures largely ignores the nature and internal dynamics of the farm-household economy, as well as that of the peasant economy. This is clearly illustrated in the discourse over education expenditures as a form of consumption or as an investment by peasant households in human capital. Kelley notes that the notion of expenditures on education, health and housing as consumption were popular in the 1960s, when planning models emphasizing sectorial capital-investment coefficients were in vogue. In the 1970s,

¹¹ D. Griffith (see n. 5 above).

however, research revealed high returns on human capital and the role of education in economic development. In fact, he anticipates returns on human capital investments to be high in Third World countries where the levels of education are low.¹²

1.3 The Household Economics Perspective

From the household economics perspective, migration is a household or family strategy, making it "part of a larger set of goals and a broader set of social processes." It can be seen as a contractual arrangement between the migrant on the one hand, and other household members on the other.

Stark and Lucas¹³ have developed a theory of urban-to-rural remittances whereby family members enter into " a

¹² A.C. Kelley, "Population Pressures, Saving and Investment in the Third World: Some Puzzles," Economic Development and Cultural Change Vol. 33, No. 3, pp. 449-464. A classic study in the field is H.S. Houthakker, "An International Comparison of Household Expenditure Patterns, Commemorating the Centennary of Engel's Law," Econometrica, Vol. 25, 1957, pp. 532-551.

¹³ O. Stark and R.E.B. Lucas, "Migration, Remittances and the Family," in Economic Development and Cultural Change, Vol.

voluntary ... (informal, self-enforcing, cooperative)... contractual arrangement with each other because they decide to be better off with the contractual arrangement than without it." This contractual arrangement "covers a series of transactions that stretch over time... (and therefore may be)... breached." According to these theorists, the mechanisms that deter violation are the involvement of an external institution (e.g., the legal authority of the state) and a calculation of individual household members that the loss (e.g., due to reprisal) would outweigh the benefits.

The value of the new household economics theory of consumption is its explicit recognition of consumption as involving a production process at the household level. Low has developed a theory of labor migration in the southern African context using the household economics approach.¹⁴ He demonstrates that in age- and sex-specific migration such as

36, No. 3, 1988. In their case study, peasants in Botswana fund their children's education in town and reserve some land for them in return for remittances.

¹⁴ A. Low, Agricultural Development in Southern Africa. Farm-household Economics and the Food Crisis, Heinemann, 1986, pp. 118-133.

that to the South African mines, young men in peasant farm-households of the labor reserve regions in southern Africa clearly have a comparative advantage over other household members in wage employment.

Low emphasizes the importance of home production in rural household time-allocation in order to "help dispel the notion that family time not spent in farm production has either a zero opportunity cost or a very low one."¹⁵ Family-labor substitution strategies are common since, from the point of view of the household, members are deployed in a multiplicity of non-market as well as market production activities. Farm production is seen as only one of these activities.

In rural Mexico, Roberts observes that households in a particular region used hired labor, even though they could provide these inputs themselves because women have a comparative advantage in other household tasks and males are often engaged in off-farm wage employment.¹⁶ Low reports a case in which researchers observed that after a project was

¹⁵ Ibid., see p. 181.

¹⁶ K.D. Roberts, "Agrarian Structure and Labour Mobility in Rural Mexico," Population and Development Review Vol. 8.

introduced, families shifted to a lower intensity of labor use. This time-allocation shift was originally interpreted as representing a shift to more leisure-time, due to the wealth effect of the project. However, Low points out that this actually represented a substitution away from the scarce resource of family time, toward a time-saving, more expensive production technology involving hired labor. This, in turn, allowed families to spend more time in household production activities. The marginal returns to time in household production activities (e.g., child care) encouraged these families to use labor-saving inputs.¹⁷

The major criticism of the notion of household economics comes from social scientists who take the "substantivist" position in anthropology. Relations between individuals outside the sphere of capitalist production as for example, in the peasant household, may be based on various factors such as "kinship" and ceremonial obligation.¹⁸ "Formal" economic rationality need not be the only analytic framework in the domestic sphere.

¹⁷ A. Low (n. 13 above), pp. 179-191.

¹⁸ See M. Sahlins, Stone Age Economics. Aldine-Atherton, 1972.

On the other hand not every action, even within the realm of capitalist production, is motivated by pure self-interest. According to Folbre:

"A number of critics, motivated in part by feminist concerns, argue that it is inconsistent and arbitrary to assume that households sit completely on one side of a boundary between altruism and self-interest."¹⁹

However, feminists also point out that there is a fundamental problem with the household economics approach, namely, that of the single household utility function. Feminist theorists contend that significant differences between men, women and children within the patriarchal household mean that it cannot be treated as an undifferentiated unit of analysis, as is the case when economists use a single household utility function.

The "new home economics theory," as conceived by feminist theorists, is based on the notion that there are fundamental differences in an individual household member's

¹⁹ N. Folbre, "Cleaning House, New Perspectives on Households," Journal of Development Economics Vol. 22, No. 6, 1986.

status (or position of power) depending upon the individual's gender and age. This "bargaining" position of men, women and children within the household reflects their economic position in society. This has important implications for the analysis of migratory effects. In societies in which for example, women and girls have a weak bargaining position, income from male emigration would not necessarily lead to an improvement in their welfare or socio-economic position.

It is widely accepted that Caribbean women hold a fairly independent economic position in their society. This is said to be the case as a result of Caribbean women's historical role in the market economy as traders. Moreover, the high degree of mobility of Caribbean men in search of jobs elsewhere, has made especially rural women de facto heads of household.²⁰

²⁰ M.G. Smith. "West Indian Family Structure," American Ethnological Society Monographs. University of Washington Press, 1962. See also D. Edwards, An Economic Study of Small Farming in Jamaica. University of the West Indies Institute of Social and Economic Research, 1961. Edwards suggests that some Jamaican women "hoarded" farm revenues in order to protect themselves in the event they were abandoned by men.

There is sufficient reason therefore, to assume that Jamaican spouses of migrants, as female heads, would have a major decision-making role in the farm-household economy. This would mean that any "contractual arrangement" between the migrant and the female head of household would have to be based upon shared priorities with regard to the disposal of household income. It would therefore be necessary to demonstrate that major farm-household priorities are held in common by both the female head as well as the male head who migrates.

1.4 Conceptual Framework

We can extend this theory of migration as a contractual arrangement between household members to include the international migration of seasonal contract laborers, such as that of Jamaican migrant farm workers to the United States.

These men, who are generally in their mid-twenties to mid-forties, are under contract to U.S. corporations under special legislation enacted in the United States and mutual agreements between the United States and the Jamaican government. Violation of this legal contract, for example, by escaping from the labor camps in the United States, would

result in severe penalties. These are: expulsion from the United States, the revocation of their temporary visa and the denial of any future visas and contracts in the United States.

Let us assume the extreme case in which a migrant who is the male head of household, is totally self-interested and would, given the opportunity, not return to his family and his farm in Jamaica. Since, under the above terms, he is legally bound to return to Jamaica after the harvesting season is over in the United States, he must enter into an informal contractual arrangement with his household. Let us assume there is an understanding that, at a minimum, the total level of farm output is maintained while he is abroad. He enters into this arrangement with his spouse, any adult sons he may have and/or with any other males in the family inside or outside his household who are responsible for supervising and/or working on the farm.

Let us further assume that this self-interested migrant has a "stake" in the welfare of his household. He enters into an agreement with his spouse, who is in charge of the household as well as the farm in his absence. He remits income to her intended for the maintenance and reproduction of herself and other household members, including children,

in return for her extra work in supervising the farm. He will also remit income targeted for farm production, which includes inputs such as hired labor. In the short-term, the migrant's spouse gains better food, clothing and shelter and increased leisure time.²¹ The migrant, upon his return to Jamaica, and for at least six months during the year, enjoys better food, clothing and shelter. This agreement will therefore be abrogated by the spouse if he does not send remittances home and we would expect her to, at least,

²¹ For the purposes of this study, we define leisure time as time not spent in physical or in domestic labor. This includes time for educating children (e.g., helping them with their homework). However, we assume that these are more often implicit agreements and understandings among household members. The qualitative as well as the quantitative analysis of farm production would determine whether the household is able to fulfill its end of the agreement. Analysis of expenditure patterns would allow us to evaluate whether "luxury" consumption is taking place or whether there is an actual investment in children. This would demonstrate whether these agreements or understandings "work." The existence of an inter-temporal agreement would be demonstrated by the type of support migrants receive from their adult children.

abandon the farm. Furthermore, this agreement only holds when both the migrant and his spouse consider the maintenance of the household a priority.

This agreement between the migrant and his spouse is also based, in turn, on their perceptions of their children as human capital. They enter into an intertemporal contractual arrangement with their children. In return for the additional benefits children enjoy as a result of the extra income from migration, such as better shelter, food, clothing, education and leisure time they will, at a minimum, maintain their elderly parents. Due to their better education, we can expect children of migrants to have better employment prospects. Better occupations of adult children of migrants, allow them to give more "insurance" and greater security and socio-economic status to their parents in their less productive years.

The agreement is based on the specific characteristics of the household. The "negotiation" process, or "bargaining" underlying each agreement, is also household or family-specific. There may be an explicit negotiation or bargaining process.

This is an economic mode of analysis. However, we do not ignore the fact that altruism and other emotions bind families and households together. Based upon this theoretical framework, therefore, we are now able to formulate a number of testable hypotheses which are based upon a comparison with non-migrant households.

1.5 Major Questions

The major questions we will attempt to answer in this study, can be divided into the broad analytical categories of production and consumption.

1.5.1 Production

1.5.1.a. Does seasonal male migration lead to agricultural decline?

Migration is said to lead to decline of both cash and food crops in developing countries, particularly in Africa and parts of the Middle East. These declines take place at the household as well as at the national level. Depending on the circumstances peasant farmers are just able to maintain levels of subsistence, however, they are unable to produce surpluses for the market. As migrants leave there is a lowering of productivity. Farming activities requiring knowledge and expertise, such as terracing and maintenance of

tools, are neglected. Land preparation and other very labor-intensive tasks are also poorly done.²²

Based on our above assumptions, however, we expect seasonal migration of men from Jamaica to lead to the maintenance of agriculture. That is, there will be no significant differences in total crop output between migrant and non-migrant households. We will reject the hypothesis that migration causes a decline in agricultural production at the household level.

1.5.1.b. Will migration lead to a shift in cropping patterns toward high value cash crops?

The higher incomes migrants earn abroad would allow them to to invest more in expensive inputs such as hired labor, seed and plants which will bring higher returns. We will

²² This trend has been identified in Africa by J. Gregory and V. Piche African Migration and Peripheral Capitalism in Migration and the Transformation of Modern African Society, op. cit., pp.45-46, and in Yemen by Swanson, among others. See J. Swanson, Emigration and Economic Development: The Case of the Yemen Arab Republic. Westview Press, 1979.

expect migrants to specialize in high value cash crops and consequently to have less crop diversity than non-migrants.

1.5.1.c. Will male migration lead women to grow more of their own crop(s)?

It is conceivable that Jamaican women, because of their relative economic independence (see above) will focus on producing their own crops, while men are away. We would therefore expect a cropping shift toward women's crops.

1.5.2 Consumption

1.5.2.a Will migrant households increase their leisure time as a result of the income effect of migration?

As incomes increase, leisure time is valued more and households forego some additional income in order to enjoy more leisure.²³ We therefore expect women and children in migrant households to have more leisure time.

1.5.2.b. Will migrant households purchase more food?

Low asserts that the opportunity cost of time of household members remaining on the farm rises with migration, because the income migrants earn increases the value of their

²³ This applies especially to wealthier households. See A.

Low, op. cit., p. 131.

opportunity cost of time. He further states that if the price of food is less than the opportunity cost of the time it takes to produce food crops, farmers will shift to purchased food.²⁴ We would therefore expect female heads of migrants' farm-households to purchase more food.

1.5.2.c. Will migrant households invest more in human capital, by spending more on education and improving the nutritional status of children?

Based on the arguments we presented above, we believe children are viewed by Jamaican peasant households as human capital and the returns to investing in children are perceived as being higher than the returns to investing in agriculture. Migrants, who have more disposable income, will invest more in children than will non-migrants. Migrant children will have better educational levels than non-migrant children. In as much as children of non-migrants are malnourished, we would expect those of migrants to have a higher weight-for-height.

1.5.2.d. Will higher educational levels lead to higher socio-economic status?

If education of children is perceived by the family as one of their strategies to improve their socio-economic

²⁴ (24) A. Low, op. cit., pp. 70-75.

status, and the returns to education viewed partly as an inter-generational transfer, then we would expect adult children of migrants not only to have higher socio-economic status when compared with the adult children of non-migrants but to also provide more financial support to their parents.

1.6. A Note On Organization

In Chapter 2 we present the design of the study, the types of data collected, methods of data collection, measurement and analysis. We conclude Part One with Chapters 3 and 4, in which we present an overview of the regional economy, history and ethnography, migration and the political economy of western St. Thomas Parish.

We begin Parts Two through Four with brief introductions summarizing the topics which will be discussed in each chapter. Part Two analyzes the social and economic characteristics of farm-households. Part Three discusses farm production and Part Four compares the income and welfare levels of migrants and non-migrants, focusing on education and nutrition.

A summary is added at the end of every chapter. However, due to the important interrelationship of farm-household income and welfare, we summarize and analyze the results of

Chapters 9 through 11, review these results in the context of structural changes in the Jamaican economy, and compare our findings with other research in the field at the end of Part Four. We conclude with a review of our analysis in Part Five, Chapter 12.

Chapter 2

RESEARCH DESIGN AND METHODS

2.1 General Organization

The research was designed in order to measure the production and consumption effects of male out-migration. The definition of migrant is a man who is in the United States as a migrant farm worker for at least twelve weeks consecutively. He is therefore unable to influence farm production and household decision-making on a daily basis. Production of agricultural output and livestock was measured every four months. Consumption was measured with a survey of annual household expenditures in an interview that was held once with each of the sixty-two households which were selected. In addition, consumption was measured through an intensive household survey of a randomly selected subsample of the sixty-two households in which household time-allocation, food expenditures and dietary histories were collected.

The contextual information on the history, sociology and economy of the region as well as the life histories of peasants were collected throughout the period of the study.

2.2 Design

Research on the effects of migration on agriculture and rural populations in the developing world has until recently focused on the implications of the departure of heterogeneous groups of migrants. Economic studies tended to concentrate on agricultural productivity rather than on the dynamic between various forms of migration and the farm-household, and its specific productivity effects. Long-term and short-term migrants, rural-urban and rural-rural migrants were all combined. In many instances, research on agriculture included farms of households which contained several cyclical migrants leaving at different points in time, including external (international) and internal migrants.

I selected seasonal migrants, that is, migrant farm workers from Jamaica who work in the U.S., in order to control for these major intervening variables.¹ By choosing a

¹ Studies of the consequences of internal or external migration on rural regions frequently ignore the effects of abandonment. In certain instances there is, in effect, abandonment "en masse" of rural communities, accompanied by a significant decline of a rural demographic group, especially of young males of productive age. The mass rural exodus of this age-cohort would bring productivity

group which leaves at the same time. I was able to eliminate the effects of different times of departure. Different departure schedules would confuse measurement of labor out-migration, either compatible with or in conflict with peak labor demand seasons on the homestead farm.

The migration to sugar cane plantations in south Florida, and to a lesser extent to apple orchards in New England, New York State and Virginia or to both, were selected as the main forms of migration. These migration schedules conflict with the major agricultural season between August and December and, in the case of the "sugar cane migration" there is also a conflict with the peak labor demand month of January. We chose forms of migration, whereby men left over a period of ten weeks, from September to November and the majority left within a four week period. This allowed us to determine more accurately the major effect

down to suboptimal levels in the region as a whole. This would be an added determinant of the productivity of an individual farm-household, beyond simply that of the migrant's absence.

of migration on agriculture, that is, the absence of a farmer during land preparation and/or planting of most of his crops.

The fact that men return within six months with this type of migration was also critical to the study, since cyclical rural migrants, particularly those in international contract labor programs who are legally unable to remain in a foreign country, have a clear commitment to returning to their farms and their families. Since migrants have a social and/or economic stake in their farm-household, such contract labor programs eliminate most of the negative effects on agricultural productivity of departures arising from major pre-existing conflicts within the home or from an unwillingness to pursue agriculture. Had this been the case, there may have been low agricultural productivity or a decline in productivity and in household welfare, even before migration would have taken place. The economic commitment to maintaining the farm means that agriculture is not neglected and that we are better able to isolate the effects of migration on farm production.

We selected St. Thomas Parish since it is a Jamaican parish with very limited off-farm economic opportunities. It lacks tourism and bauxite mining, Jamaica's main industries, and has very few manufacturing plants. St. Thomas's

population has one of two choices, either farming or migration. St. Thomas was therefore selected because a sample drawn from this parish would be unlikely to have their agricultural productivity influenced by economic activities other than migration.

St. Thomas has a sizeable agrarian population in the most productive age-group, between fifteen and forty-nine years of age (see below), indicating that the parish has not experienced a significant degree of out-migration of this age-cohort.

We used purposive sampling to select the region of St. Thomas most resembling that of rural Jamaica socio-economically, with the assistance of a political scientist² who had conducted numerous political surveys in the parish. The region chosen was western St. Thomas, because it was

² B.D. Miller and C. Stone, The Low-Income Household Expenditure Survey: Description and Analysis Jamaica Tax Structure Examination Project Staff Paper No. 25. Maxwell School, Syracuse University, and Board of Revenue, Government of Jamaica, 1985, p. ix. The research area in western St. Thomas was selected with Carl Stone's assistance, using purposive sampling.

socio-economically representative of rural Jamaica. Eastern St. Thomas was excluded because of its high rate of landlessness and extreme poverty.

We selected households with at least a male head or with both male and female "co-resident heads", as is referred to in the literature on Jamaica.³ We decided to use the terms male and female household heads because women in migrant households assume headship of the production unit upon the man's departure. Moreover, a Jamaican woman is often included in major farm production decisions, depending upon her age and experience.

The design of the studies of the intra-household provisioning and patterning of resources was developed within a seasonal framework. The season in which migrants were in the United States was considered Season One and the Season in which migrants returned from the United States was considered Season Two. Anthropometric studies focusing on short-term

3 Jamaican households are also referred to as joint male-female headed households. See B.D. Miller, Gender and Low-Income Household Expenditures in Jamaica, in Orlove, B. and H. Rutz, eds. The Social Economy of Consumption. Lanham, MD: University Press of America, 1990.

changes in nutritional status were designed to examine whether there were changes in weight-for-age due to seasonal migration of men. We therefore chose to collect this data of migrant and non-migrant children at the end of the migratory season, just as the last group of men returned to their homes. This would capture the effects in migrant households on children's nutrition over the months their fathers worked in the United States, while comparing them with the children of non-migrants over the same period of observation.

2.3 Methodology

We decided to structure the research project in various phases, each of which would center around a particular method or a combination of methods.

2.3.1 Phase I

The first phase, between the end of April and the end of July 1986, was used to become acquainted with the parish of St. Thomas and to conduct preliminary interviews with Ministry of Health and Ministry of Labor staff familiar with St. Thomas, as well as key informant interviews with small farmers. Several trips were made to survey the entire parish and to familiarize ourselves with its geography and the clustering of its communities. We consulted Jamaican experts in national and community surveys in order to select that

part of St. Thomas most representative of rural Jamaica. These preliminary surveys and interviews were conducted by this researcher, sometimes jointly with Ministry of Health staff in St. Thomas, who assisted in the selection of key informants when western St. Thomas was chosen as the preferred research area.

After approval was granted by the Ministry of Labor for research on Jamaicans from St. Thomas Parish in the British West Indian Alien Labor Program, we received a list of names of men who had applied for the program. This included "pool men" who were going to the U.S. for the first time and "pre-des men," who had worked in the U.S. during the previous season and who had been recalled by their U.S. corporations, who were satisfied with their performance (see ethnography, below).

Through the key informant interviews with small farmers we were able to gain insight into local institutional arrangements, particularly the labor arrangements of farm-households and other production relationships as well as land use and inheritance patterns.

2.3.2 Phase II

Phase Two began in August of 1986. I selected a small farmer from Arntully, a part of Moy Hall district in the northern part of the region, to assist me in the preliminary selection and interviews with migrant farm worker households.

We selected an opportunistic sample, that is, all men who agreed to participate in the study were accepted in the preliminary selection phase, since we did not know who would be in the final group selected for farm work by the Ministry of Labor and the U.S. corporations. Even pre-designated men could be formally excluded based upon health reasons, an infectious or a chronic disease such as hypertension. Those men who were ultimately selected were then included in our study, while we ensured that this was a representative sample of the region, stratified by men's age and their land size (used as a proxy for wealth). Thirty-four or approximately one-third of the migrant farm-workers who went to the United States from our research area in western St. Thomas were represented in our study.

Most of the men were not informed as to whether they were selected or as to the date of their departure until several days before leaving for the United States. We conducted a rapid survey interviewing men extensively on farm production, while focusing on qualitative and less on

quantitative information, since we believed it would be more appropriate to collect good quantitative data after we had established a relationship of trust with their households over a period of several months. This was the first time an ethnographic study was being conducted in a parish which is fairly isolated and of which the population was known to be suspicious of outsiders. We were later told by small farmers that this researcher's foreign origin worked in our favor, since in some instances a Jamaican researcher may not have gained access to their households. Small farmers reported that this was particularly true in a politically sensitive study which dealt on the one hand with those selected for migrant farm work in the United States, and on the other hand, with their incomes, the amount of food they purchased and consumed.

We conducted surveys of migrant households between August and November of 1986, during this period we began pre-selecting non-migrant controls. We ultimately selected twenty-eight non-migrant households. Of the eighty households originally selected, sixty-two were included in our analysis.

In February 1987, I collected data on admissions for gastroenteritis and malnutrition, and on the birthweights of infants born to women in the research area, with the

assistance of physician at the Princess Margaret Hospital in Morant Bay, the capital of St. Thomas Parish.

The large survey of sixty-two households included structured and unstructured interviews. The structured interviews covered agriculture and livestock production, and sales and consumption patterns of crops and livestock, land purchases, household expenditures, health and health services utilization of household members, family and social networks within Jamaica and abroad, marketing patterns and networks, off-farm employment of all household members, and identification of the farm-household based upon those individuals farmers considered part of their household (see Appendix). The unstructured interviews covered life histories, historical demography (i.e., inter-generational migration patterns), intra-household, intra-familial and community relationships.

I collected agricultural data every four months to obtain information on monthly crop production. The large survey as well as the unstructured interviews with the male and female heads of the sixty-two households was conducted by this researcher alone, to protect the privacy of informants and to ensure consistency in the quality of the information being collected.

We documented the prices of a variety of household items available in one store and in a village "shop," which has a smaller inventory than a store.

Intensive surveys were conducted of a stratified random subsample of the sixty-two households during two seasons, and used a random numbers table to select this sample. These interviews were conducted by one woman and by three men who came from districts in the research area.

This smaller study of twenty-eight out of the sixty-two households was designed to collect information from female household heads of both migrant and non-migrant households, on the interaction between patterns of production and intra-household distribution, and on the seasonal farming and domestic activities of each household member. We also studied time-allocation in domestic, farm and off-farm activities of all household members, twenty-four-hour dietary recalls, household and food purchases, foods produced, foods sold, foods shared with neighbors or relatives and crops fed to livestock. During the first season, when migrants were still abroad between February and April 1987, twenty-eight female heads of household and occasionally the daughters of some of these women, were interviewed by one woman and two men over a

period of from three to six weeks every other day. During the second season when migrants had returned, in July and August of 1987 female heads of twenty-four households or their daughters, who substituted when they were unavailable, were interviewed by three men every day over a period of two weeks. We also observed women's activities over a twenty-four-hour period on three occasions.

I also conducted a series of interviews with thirty-seven people, including twenty key informants whom I interviewed regularly. These people lived in the research area but were not included in the household surveys. These included an itinerant fish vendor, an itinerant butcher, a policewoman, a secondary school teacher, a primary school principal, a newspaper reporter, some older farmers, a nurse's aide, physicians, an agricultural extension officer, the manager of a large coffee plantation, the manager of a large dairy, taxi and bus drivers, women who worked on tobacco plantations, and an adolescent boy in a school feeding (school lunch) program. I interviewed approximately one hundred other informants over the period of the study, including schoolchildren, families who were friends or relatives of those in the study, young men who had extensive contacts in certain districts, and elderly women and men who were acquainted with traditional midwifery, cultural

traditions involving food and medicine, as well as marriage, funerals, and "Kumina" dance, song and drum-playing.

An anthropometric study of a random sample of 119 children of migrants and non-migrants was conducted at the end of April 1987. I was assisted by a staff member of the research department of the Nutrition and Dietetics Division of the Ministry of Health and by a small farmer who was related to one of the interviewers conducting the intensive household study (below).

I also worked intermittently with the Soil Survey of the Ministry of Agriculture over the period from May to August 1987. I was trained in the use of aerial photography to trace changes in land use and human settlement patterns in the region over the last twenty years.

2.3.3 Phase Three

In the final phase of field research in the region, between July and October of 1987, I interviewed migrants and non-migrants on agricultural production shifts in the new agricultural year, which began in August and September of 1987 (see Ethnography). In November 1987, we concluded our study of western St. Thomas with a survey of the physical geography and geomorphology of the region under the

supervision, and with the assistance, of a physical geographer/regional planner.

I left Jamaica in December of 1987, having spent nineteen months there, of which the greater part of fourteen months were spent in western St. Thomas. During a large part of the field research I resided in the home of the Medical Officer of Health for St. Thomas, in Cedar Valley, and lived some of the time in a small farm household. I returned to Jamaica at the end of May, 1988, to conduct interviews on Jamaican in agricultural and food policy.

The individuals interviewed over a three week period included Jamaican government staff in the Ministry of Agriculture, the Medical Officer of Health for St. Thomas, the Research Director of Agro-21, the Executive Director of the Planning Institute of Jamaica, the chair of the food pricing policy committee, the FAO Representative, the WFP (United Nations World Food Program) Representative, the director of the nutrition research unit for the Ministry of Health, a representative of the Jamaica Commodities Trading Commission (JCTC), which imports PL-480 foods from the United States, USAID staff involved in agricultural development projects, the Research Director of the Central Bank, and the

Jamaican economist who coordinated the Living Standards Measurement Survey of the World Bank.

My research has continued since I have maintained correspondence with participants in the study and have been able to track occupational mobility and migratory patterns of the adult children of migrants.

I have consulted with former Jamaican small farmers who reside in Cambridge, Massachusetts on data analysis and interpretation. While analyzing the data, I have also consulted with the St. Thomas Land Authority of the Ministry of Agriculture.

2.3.4 Selection of Interviewers

We were able to verify that there were no cultural barriers in having men interview women. The spontaneity of women's responses depended upon the personality and style of the interviewer. Those interviewers who initially met with resistance in some districts were transferred to other districts where they were quite popular with the women and their children, as well as with men. We attempted not to use interviewers in communities they resided in themselves in order to reassure participants of confidentiality. However, we were unable to do so in two cases. One interviewer lived

in a fairly isolated community and had to interview families in his own area, because we could not find interviewers from other communities who could collect data for us. However, we ensured that he was trusted by residents in these districts who participated in the study. During Season Two, a new interviewer was used to replace our female interviewer who had fallen ill. This young man had been a kindergarten teacher and was respected and trusted in his own community. Interviewers were themselves small farmers with varying backgrounds. A shop-keeper, a former domestic servant, a former agricultural extension agent and a former teacher who were unemployed, as were many at that time who shared the same backgrounds.

2.3.5 Data Analysis and Limitations

Ethnological, econometric and nutritional methods of analysis were used. I collected quantitative agricultural data in standard as well as in local units (e.g., tins, ties, bangles, bags, boxes), I converted most of the ethnographic units into standard measurement units during October and November of 1989.

The econometric analysis included using production functions which assume constant returns to labor, land and inputs, which we believe in this case, to be a valid

assumption. However, the drawback of using production functions is that it assumes the presence of a single household decision-maker. It is a model which does not take into account the notion of conflict in the household decision-making process. However, my interviews have shown no major conflicts between women and men in production decisions (see below). Men do not interfere with the decisions of women who cultivate crops separately, for instance. We report cases in which conflicts did exist below. Moreover, our agricultural data reflects production declines in these cases.

I was unable to include the time-allocation analysis, the dietary analysis and the food expenditure analysis in Season Two in this thesis due to technical and time constraints. I was also unable to perform a more complete analysis of household time-allocation study, that is, the specific uses to which labor and leisure-time were put by each household member. We were also unable to include a study of Jamaican food and agricultural policy between 1985 to 1987 due to time limitations. This will be reported in a future publication.

Chapter 3

REGIONAL ECONOMY and AGRARIAN POLITICAL ECONOMY

3.1 Introduction

St. Thomas is a parish in the southeastern corner of Jamaica, bordering the parishes of Kingston and St. Andrew on the east and Portland to the south. The population size is approximately 80,441, according to the 1982 census. Males aged 15 - 44 comprised 15,458 or 39 percent of the male population, females aged 15 - 44 comprised 15,595 or 38 percent of the female population. The economically active population, defined as those between fifteen and sixty-four years of age, was 41,685 or 52 percent of the total population. There are 130 enumeration districts (EDs) in the entire politico-administrative unit of western St. Thomas. Each rural enumeration district contains approximately one hundred households.¹

3.2 The Setting

Tourists from Kingston who take the southeastern route to Port Antonio, drive eastward along the coast passing

1 Population Census 1982, Statistical Institute of Jamaica, 1987.

through Morant Bay, the capital of the parish on their way to this north coast resort. At the "roundabout," just before entering Morant Bay, the road on the left leads to the research area, beginning with Seaforth and then Blue Mountain Valley. Most travellers continue on toward Portland, passing through the old town of Bath with its mineral spring and the stone ruins of the "Great Houses" of the old sugar plantations. They also pass the large banana and coconut plantations, the sugar cane factory of Duckenfield, with its black smoke hovering over the decrepit shacks in which the workers live. As they go around a bend and cross the border into the parish of Portland, with its lush vegetation and well built homes, and secluded enclaves for the (mostly European) "rich and famous," it is obvious even to the untrained observer, that the general level of welfare of the peasantry is higher than in most of St. Thomas.

One first comes to the town of Seaforth, a fairly orderly, if somewhat dusty little town (partly due to the quarry nearby and the sandy soil), with a public phone (the last phone one will encounter), a police station, a primary and a secondary school, a small supermarket, a small open market and a "suburb" (Seaforth Gardens), where the government built a public housing scheme several years earlier.

The research area is quite beautiful, reminding the occasional visitor who enters it through Blue Mountain Valley of the Alps. The deep blue hue of the minerals which give the mountains their name makes the landscape particularly scenic in colder seasons, when mist envelops the foothills. The wide expanse of this fertile valley containing the Serge Island pastures and the Careras tobacco lands, narrows to form a southeast to northwest "corridor," a gully through which a winding road follows the course of the eastern branch of the Negro river, ascends northwest, and ends in the Arntully Hills beneath Blue Mountain Peak.

The physical lay-out of most districts is fairly simple, with wooden, nog (wood and wire-frame cement) houses and concrete block houses arrayed in rows along both sides of the main road, sometimes perched precariously on a steep slope. Narrow paths and occasional back roads lead to other parts of a district which would be located higher up. In coastal and other districts located on level land, there are regular roads which separate blocks with houses.

3.2 Historical Demography

The peasantry of western St. Thomas are mainly smallholders who own or lease, on average, from two to five

acres of land in long-term leases. They maintain relatively stable conjugal relationships with two-generation nuclear or three-generation extended families. These small farmers are descended from slaves who worked primarily on the large sugar plantations in the coast and, to a lesser extent, on sugar and coffee plantations in the mountains.

When formal emancipation (i.e., manumission) was proclaimed in 1834 and, when in 1838 actual emancipation took place, freed slaves began farming independently. They established settlements in the Blue Mountains, particularly at higher altitudes around large coffee plantations as well as on a few mountain sugar estates.

Most of these settlements were slowly abandoned over a period of four decades. Movement from higher to lower altitudes began in the nineteen thirties and ended in the seventies, as a chain reaction was set in motion. Population in these mountain hamlets declined with migration to England. Opportunities opened up in England, which needed factory labor immediately following the Second World War.

The rate of change in settlement patterns accelerated in the fifties and sixties, as more families emigrated abroad. It ended in the seventies as physical infrastructure (roads,

piped water) and medical care became more accessible to lowland communities. This attracted remaining hill residents who were becoming increasingly isolated due to the emigration of their neighbors and as the government began to neglect physical infrastructure (bridle paths) in the hills. This trend was particularly evident among those in the districts of Island Head and Wakefield who lived in the hills surrounding Trinity Ville. This community, which borders the large plantation zone on the north, experienced steady population growth throughout the 1970s. By 1982, Trinity Ville had about 2200 residents.

The abandoned deep rural settlements, from Arntully Gap down to Georgia Wood, are now being used as farmland. Some of the land, as that in Wakefield, has been taken over by forest or lies unused. In other cases, as with much of the land above Cedar Valley and in the Monckland Hills, soil fertility has declined and topsoil lost due to soil depletion and erosion. This deterioration of the physical environment is caused by overexploitation of friable volcanic soils on steep slopes (from 25 to 40 degrees). However, one can still find a few small communities at higher altitudes, settled on the benches and saddles of the Blue Mountain range.

Internal migration was brought about by Serge Island when it was a large sugar plantation. Men who were skilled cane cutters were drawn to the region from eastern St. Thomas and the parish of St. Catherine, both large sugar-producing zones, as well as from isolated northern districts such as Penlyne Castle. These men settled and established families in communities such as Danvers Pen, Trinity Ville and Mount Lebanon, in the vicinity of Serge Island. A small but significant number of the population in their twenties and thirties have fathers who migrated to the research area from these regions.

3.3 The Racial and Cultural Background of the Peasantry

A small group of farmers are descended from Africans who were brought to Jamaica as indentured servants to provide labor for the sugar estates during the late nineteenth and early twentieth centuries. Some older farmers recall their grandfathers having arrived from Africa as late as the nineteen twenties. Some are also descended from white plantation owners who were mainly British, although some German settlers established large farms as well.

Certain farmers trace part of their ancestry to Sri Lanka, India or China, whence agricultural workers came in the late nineteenth and early twentieth centuries. Place-

names like "Swamp" (a rocky hill) and "Cajun Call" in Font Hill district suggest other possible national origins.

3.4 The Region

The research area, comprised of mostly upland settlements, is not as poor as are eastern and coastal St. Thomas, which have higher rates and more severe forms of early child malnutrition.² The peasantry of eastern St. Thomas are, in fact, called "poor" by those in western St. Thomas.

Western St. Thomas is therefore more representative of other Jamaican small farmers than is the landless peasantry of eastern St. Thomas. At the same time, the development problems confronting western St. Thomas are more representative of those faced by rural communities in the Third World, when compared with parts of rural Jamaica influenced by the seasonal tourist trade or mining.

In spite of its proximity to Kingston (50 miles from Cedar Valley), parts of the research area are fairly difficult to reach. The topography of the lower Yallahs watershed is characterized by steep mountains and deep

² St. Thomas Annual Report, Government of Jamaica Ministry of Health, 1985.

gullies. This makes travel between the research area and the nation's capital cumbersome. The coastal road is in good repair and, except for some hazardous corners around the edges of cliffs by the ocean, makes access easier during good weather when it is not flooded. However, it is a circuitous route, as is the road through the hills via Llandewey, along the lower Yallahs river. Women lose precious time on market days in commuting between their homes and Kingston. Many must rise as early as three in the morning to catch a bus which allows them to arrive in Kingston between thirty minutes to about an hour before the Coronation Market officially opens at seven o'clock.

Development efforts, such as the now defunct Yallahs Valley Land Authority, the first attempt at regional planning in Jamaica, have been sporadic at best.³ Yet, western St. Thomas has been used to supply water to Kingston and St. Andrew, representing about one-half of the Jamaican population. Water from the lower Yallahs watershed is diverted to these parishes, leaving farmers in the drought-prone Yallahs Valley with seasonal water shortages and higher rates of typhoid than were prevalent elsewhere in the parish.

³ D. Barker. Department of Geography University of the West Indies. Personal communication, November 1987.

Social scientists have also demonstrated little interest in this parish. There is hardly any documentation of the agrarian communities beyond the Upper Yallahs Valley in St. Andrew. Only a few unpublished documents exist on the westernmost part of St. Thomas, on the St. Andrew border.

The research area contains forty-nine enumeration districts and a population of about 4900 households, or 37.6 percent of the total enumerated households in western St. Thomas. It is contiguous, and overlaps with, the Lower Yallahs watershed, encompassing a number of districts which make up the eastern border of the watershed.⁴

These forty-nine enumeration districts are made up of fifteen communities, from Belvedere in the south to Arntully in the north, including notably the following. Seaforth, the only rural town in the research area, is both a local and a small regional trading center. Somerset, the second largest district in the parish, is located in the central highlands of the research area. Along with Island Head higher up in the hills, it constitutes a large cohesive community overlooking

⁴ 1982 Jamaica Population Census, op. cit.

Serge Island and the large plantation zone immediately to its south.

Somerset/Island Head is made up of large extended families and, because of its particular physical ecological advantages (i.e., light soils), its size and high level of economic organization, out-competes all other areas in carrot production. The community is fervently PNP (People's National Party, see below). Their slogan, "'Labour is Pain," is intended as a slight to its opposition, the JLP (Jamaica Labour Party).

Cedar Valley, in the north, boasts the only courthouse in the research area. Its Indian mayor is a businessman who owns the only store.⁵ He is also the mayor of Morant Bay, the capital of St. Thomas, which firmly establishes the seat of JLP political power in St. Thomas in this remote village.

3.5 Patterns of Land Distribution and Settlement

Most of the population of St. Thomas lives on the coast and in the eastern part of the parish, where the land has tended to remain in the hands of the descendents of slave

⁵ A store is distinct from a shop, which is smaller (see below).

owners. This group has dwindled and is now essentially made up of three old "white Jamaican" families who have owned these vast tracts of land for many generations.

This extreme maldistribution of land and wealth which characterizes especially the fertile coastal plains of eastern St. Thomas, does not exist in the hill communities of western St. Thomas. Here only a few relatively small coffee plantations are owned by private investors.

One can no longer actually speak of a large landowning "class" in the research area. Land changes hands frequently as investors based in Kingston seek a "quick" profit from agriculture. These are young professionals or merchants who are themselves struggling in a difficult economic environment and lack sufficient capital to sustain intermittent losses.

This changing pattern of land ownership has even penetrated the coast, where large farms are subdivided. They are sold off to other absentee landlords, leased to small farmers or they are farmed on a seasonal basis. In the case of tobacco, for example, wage laborers are hired from among landless peasants in the surrounding communities. Otherwise, the land is left in coconut stands when landowners are unable to manage large plantations. Two years ago, Belvedere, one of

the few remaining coastal sugar estates which had belonged to an old "white Jamaican" family, was sold to Tropicana.

3.6 Recent Economic Trends in the Region

The regional economy has been in decline since 1973, when Serge Island stopped producing sugar. Not only were sugar workers and their families displaced, but small farmers throughout the region who sold sugar cane to the Serge factory, were forced to stop producing their major cash crop. The economy has never recovered. The parish lacks tourism and has little manufacturing. Off-farm wage labor opportunities in the research area are limited. Jobs are hard to find in the dairy (Serge Island), the banana plantation, the coconut plantation, the tobacco plantation (Carreras), the small food-processing (ackee) factory, the rubber factory (Firestone), the forestry parastatal (Forestry Industries Development Company), and the sugar plantation owned by the Duckenfield corporation, based in eastern St. Thomas. These firms employ a total number of about one hundred and twenty individuals.

In addition to these large enterprises, there are only a handful of medium to large farms (more than twenty acres), some owned by politicians or political figures at the national level. These farms are geared primarily toward the

export markets for coffee and tropical flowers which employ only a very small number of people.

Neighboring small farms can only provide seasonal wage labor. Migration is therefore the only option besides farming. This has historically been the case for the country as a whole, however, this is especially true for St. Thomas today.

3.7 Peasant-State Relations and the Socio-Political Structure

The exploitation, resistance to and oppression by the "white" plantocracy of St. Thomas, is still vivid in the popular memory, and influences attitudes toward the state. St. Thomas is the most politically conservative parish in Jamaica. In the parish known for the Morant Bay "rebellion" and the sugar workers' revolt at Duckenfield in the nineteen thirties, the party of the large landowners is also that of the peasants.

In the recent national election, St. Thomas was the only parish which voted for the Jamaica Labour Party (JLP) of Edward Seaga, continuing a tradition which has been broken

only once, in elections for the second term of Michael Manley's first PNP (People's National Party) government in 1976.

The social organization of the peasantry is based on kinship, followed by political affiliation. The political hierarchy begins at the national level, with the member of parliament representing western St. Thomas, who visits his constituency regularly.

St. Thomas is divided into two politico-administrative units or "constituencies," eastern and western St. Thomas. Both members of parliament representing St. Thomas held key ministerial posts in the JLP government of Edward Seaga. The Member of Parliament representing western St. Thomas, who was Minister of Public Works when we first started our research, later became Minister of National Security.

A constituency is composed of several divisions. Each division, in turn, is made up of a number of districts. A division is represented by an elected Parish Council. There were some major upsets, in "local," that is, Parish Council elections in August 1986. A number of PNP councillors were chosen in parts of eastern St. Thomas. Although some very

close races were reported in western St. Thomas, there were no important changes in the political landscape.

The constituency of western St. Thomas is made up of five divisions. Each parish councillor allocates resources and monitors his communities through his political cohort in the districts of his division. This is most obvious in the control of wage labor opportunities at the regional, national and international levels (below).

Justices of the peace, appointed by members of the party in power, constitute another group of local power brokers. These tend to be older farmers. A small percentage are religious leaders and teachers, who are generally perceived as being politically neutral.

Local businessmen or large landowners, belonging to the ruling party and who may be brokers in the region or at the national level, may also be selected. Their appointment as justices of the peace sends a powerful signal to small farmers in their respective communities, who may be dependent on them as hired laborers or tenants.

3.8 Forms of Political Integration

Most farmers in the research area were independent producers. However, growing population pressure on land, diminishing farm size, and an increasing desire for consumer goods changed economic and social relations internally among the peasantry (see below) and externally with the State.

State control was exercised through the allocation of public works jobs, jobs with parastatals or large plantation owners belonging to the dominant party within the region or in other parishes, or through the allocation of most of the seasonal farm labor contracts with the United States and Canada.

Public works jobs on roads ("road work") are distributed in December after the long rainy season, just before Christmas, when the need for extra cash is particularly great. Jobs allocated by parish councillors may make a difference in being able to maintain one's level of subsistence. That is, having adequate food or enough food with which to celebrate Christmas, the major holiday, "properly."

The distribution of these much sought-after public works jobs through the Parish Council system changed toward the end of 1986 when the role of parish councils was drastically

altered. Prime Minister Seaga decided to centralize government services by bringing all responsibilities for physical infrastructure under the purview of the Department of Public Works. Other positions, such as those of sanitary inspectors, were removed from parish council control and transferred to the Ministry of Health, and those at the pump houses, where water is chlorinated, were transferred to the National Water Commission.

However, the political patronage system was not eliminated, since subcontracts were awarded to the male friends or relatives of local politicians. In the final stage of this "trickle down" process, the female relatives and children would assist by carrying stones and water for asphalt roads, while men would dig and resurface the road.

Parish councillors derive their most important power, however, from giving men access to migrant farm work. Not only does seasonal migration, within Jamaica and to North America play an important part in the Jamaican political economy, but also has a pivotal role in the agrarian political economy. Elders, older men as well as some older women maintain, through brokering, a degree of control over the labor of young men which they might otherwise not have had.

Should young men have independent access to wage labor, they might use their earnings to establish independent farms at an early age or move away to urban areas. It is therefore important for elders to control the allocation of this lucrative sources of employment. This is especially true for landless areas, which are already experiencing a relatively higher rate of outmigration. Parents often find themselves struggling to hold on to the labor of their young adult sons. One middle-aged man remarked, "When they were younger, you could control them. Now they are getting older, their friends go to Kingston and they get to know the world."

The analysis of the political economic relations with the national center and with the United States the "dependence" of this region. However, even in one as dependent as western St. Thomas, there are subtle, day-to-day expressions of discontent and disaffection in the reaction to agents of the State and to state policies. The manifestation of this tension cannot be overlooked.

For example, some migrants who did not receive their "compulsory savings" upon their return to Jamaica said they had heard politicians had used it to finance their political campaigns. On a particular day upon which the Prime Minister, to whose party the majority belonged, paid a visit to Cedar

Valley, the turn-out was much lower than had been anticipated.

Chapter 4

FARMING AND AGRARIAN LIFE

4.1 Physical Geography

The geology of Jamaica is relatively young. The Blue Mountains represent a volcanic inlier. The central ridge, Blue Mountain Peak, is 15 kilometers from the coastline in St. Andrew and rises to 2256 meters. The oldest rocks found are of Cretaceous age. Most of the mountains are conglomerates of the Richmond Formation (Lower and Middle Eocene). Marine sandstones and shales, flanked by limestone, are found with sedimentary rocks (Lower Eocene).¹

The small farming communities of the research area which straddle the Negro and Lower Yallahs watersheds and the Negro and Morant river system basin, include economic-ecological zones with slopes sixty-five percent of which are steeper than 25 degrees. This is the upper limit recommended for intensive cropping. The altitudes of cultivated fields range from sea level to approximately 5500 feet.

¹ D. Barker and D. MacGregor, "Land Resources and Development Papers in Geography No. 18, Bedford College, University of London, Dept. of Geography, 1985.

Most of the soils in this mountainous northern part of the research area, are classified as infertile by the Soil Survey of the Ministry of Agriculture.² In the southern part of the research area, one finds limestones in combination with gravels, sands, loams and some clays.³

The climate is also highly variable. As one travels north to south (about a forty minute drive), the temperature may rise from about fifty degrees in the highlands to close to eighty-five degrees in the coastal plain.

Annual rainfall ranges from 60 to 120 inches annually. The Blue Mountain range produces a significant rain shadow effect. In our research area, on the leeward side of the central ridge, the greatest amount of rainfall took place in

² Soil map provided by Government of Jamaica Ministry of Agriculture Soil Survey.

³ D.F.M. MacGregor, D. Barker and L.A. Miller, "Land Resources and Development in the Upper Yallahs Valley," Papers in Geography No. 18, Bedford College, University of London, 1985.

the highest mountains which are surrounded by mist, while lower regions experienced extended periods of drought.⁴

Convectional storms and torrential rainfall add to the loss of topsoil instead of increasing fertility. During the rainy seasons we found, on two occasions, boulders of about nine feet in diameter on a part of the road we had just driven through several hours earlier. Land- and rockslides which result in loss of life, are not uncommon in the rainy season. Intermittent streams and rivers, used as paths during the dry season are fed by underground water which collects through porous limestone after rains. The marked seasonality of the region is also evident in the dramatic change which takes place in the landscape. Vegetation, which only a week earlier may have been a yellowish brown, suddenly changes into a lush green.

Despite a fragile and largely marginal environment in large parts of the highlands, the variety of soils and climate within a relatively small region allows sufficient ecological diversity for the population to survive. However, the small size of the the average holding is a major reason farmers cannot significantly increase output.

⁴ Meteorological Service, Government of Jamaica, 1988.

4.2 Production: The Annual Agricultural Round

Life in these farming communities revolves around two distinct agricultural cycles. The primary cycle in this region begins with land preparation in August and September in anticipation of the long rainy season at the end of September and in October. In the coastal lowland communities, the dominant pattern is that of sharecroppers and wage laborers who prepare land during the month of August for the tobacco cycle. In the coastal upland communities and in the foothills and mountains below Blue Mountain Peak in the north, farmers begin preparing fields at different altitudes for a wide variety of the major annual and perennial cash and food crops. Planting may continue until December.

After the second round of land preparation in January, planting begins in February. This is a major season for planting especially important subsistence crops since these crops have higher yields when planted in spring (certain yam varieties). In districts situated in dense forests (Jones Pen, Mount Vernon), where forest crops such as coffee and cocoa are cultivated, the peak labor demand month is January.

4.2.1 Organization of Labor

There are essentially five forms of agricultural labor. Household labor of men, women and children, hired labor of men and women, and reciprocal labor exchanged among men, among women and occasionally between men and women. Hired labor can take the form of "day work" (paid on a daily basis), "task work" whereby men or women are paid for a specific task, such as weeding or winnowing in the case of women. Payment for task work can also be at a "piece rate" per unit of output, such as the pounds reaped or the number of tins of pimento which are shelled. Hired labor also takes the form of "job work" whereby the farmer gives a contract to a man to do a large task, such as land preparation. The hired man/contractor is paid a lump sum with which he hires other men and women, paying them for task work. Exchange labor is reciprocated in work and food, or simply in food in some cases (i.e., occasionally boys are paid in food). Sometimes a man or woman provides extra labor or a special service to a farmer and is paid in housing and subsistence, or is paid in land. This "encouraging" relationship is acknowledged as a special economic arrangement by both parties, and it operates independently of other relationships that would include a combination of cash and in-kind payments.

4.2.1.a. Men's Agricultural Labor

Land preparation is the main task which men perform almost exclusively. When land must be prepared they often rise before dawn, drink tea (poorer men go without breakfast), eat a hot lunch in the fields which is brought to them by their spouses, and often return home as late as eight or nine o'clock at night. Male heads of household work with several other men, a small group of "partners," from two to five men with whom they exchange labor, and/or from one to four hired men.

Younger men who enjoy particularly good relationships with their peers, may get up to five partners to help them. Labor has a high opportunity cost at this time of year and exchange labor is often a necessity. The labor of these other men is especially critical in land preparation since the area which can be covered by any one man in a day, particularly on the steeper slopes during the hot dry season of August, when the major land preparation cycle begins, is limited.

Access to labor during this period determines the efficiency with which farmers are able to clear undergrowth, open up "new" land (cutting down trees), "plow" (hoe), fork, "cut contours" (a form of terracing) and dig trenches before the rainy season. Poorer farmers who have insufficient labor,

clear land by burning. They risk a fine, since burning is illegal. Fires can be seen burning in woods below the Peak such as "Cutter Wood," as late as eleven o'clock at night. Penalties are difficult to enforce, since government layoffs of agricultural extension officers reduced their number in the research area from ten to three. Burning at night, when it is cooler, is therefore primarily intended to prevent the spread of fire.⁵

The ability to recruit labor during this season is crucial for all farmers but especially for those who are prospective migrants. Men who expect to be abroad between the period beginning mid-August/late October and ending March/April miss the two major land preparation seasons, August/September and January/February, except in one economic-ecological zone, where farmers prepare land around February and March. This zone is comprised of the communities Holiday Hill, Jones Pen, Wakefield, and Mount Vernon.

Prospective migrants tend to use hired labor more than non-migrants. However, teen-aged sons of migrants often carry

⁵ This method is also used on the cane plantations of Florida, and for the same reason. The dew allows one to control the spread of fire.

a significant responsibility for the farm. Even when a teen-aged boy is able to attend school and does not have to farm, he may be called upon to fill his father's place at any moment, if necessary.

There is an increase in the rural wage rate for men at this time from twenty to twenty-five or thirty Jamaican dollars per day plus lunch and cigarettes or "ganja" (i.e., marijuana). Lunch consists of a chicken or meat stew with a staple such as rice or yams and bananas. Single men hire women (J. \$10 per day) to cook for the men. Otherwise, spouses cook for hired and exchange laborers, bringing the meals to them in the fields. The actual wage rate is therefore between thirty and forty Jamaican dollars per day during this peak season.

Migrants who work on apple orchards in upstate New York and New England leave in August and September. Some men will return in October and November, others will go to Florida to work for sugar corporations until about March or April. Work arrangements are made with family members, and "partners," whom they will pay as hired men while abroad. Migrants who leave during the months of August and September still have a few disadvantages. For example, they are less able to construct contour barriers (terraces) when compared

with other farmers, since this feature of land preparation is very labor-intensive. On the other hand, circular movement of a smaller number of farm workers who pick peaches in Canada or work on tobacco farms in the southern United States, and leave in March to return in August/September, is compatible with the agricultural cycle at home.

4.2.1.b. Women's Agricultural Labor

The months of August through December tend to be the busiest for women. Since land preparation is a task they rarely undertake, women continue their usual agricultural (i.e., field) activities of planting, maintaining crops (i.e., weeding and pruning) and harvesting. Women plant all crops together with men. However, weeding of "small grass," which is primarily women's work, is especially time-consuming after it rains in areas with clay soil. They also plant and market crops separately from men (see below).

Female heads of household select hired or exchange men and women from among their friends and relative and supervise production units made up of females.

While hired men are paid a mean wage of J.\$ 25 per day plus a cooked lunch which averages J.\$ 5 per day, hired women report earning between J. \$ 12 and J. \$5 per day. Their lunch

consists of a sweetened bun with a slice of "cheese" (cheese food) and a "box drink" (a non-carbonated soft drink).

Maintenance tasks increase for women during the rainy season. In the month of October and part of November maintenance tasks carry as much weight as planting. Trenches have to be cleaned to allow drainage. Women in migrant households must find men who can help them maintain and reinforce grass or bamboo "contours" (a form of terracing). The few who constructed bamboo pipes for irrigation during a previous dry season must ensure that they were not dislodged due to rain and wind. Farmers with "stony land" spend additional time clearing stones from fields after wind and rain storms. This has important implications for migrant households, adding considerably to women's labor requirements in agriculture, since the majority of men leave at this time.

4.2.1.c. Children's Farm Labor

During this first round of land preparation, children must take over not only domestic chores, but agricultural labor which cannot be performed by one or both parents/heads of household. Girls and older children (above nine) assist in preparing meals and in bathing and dressing younger children. Boys cut and carry bamboo sticks, and grass or carry stones

for the building and/or reinforcement of contour barriers, which are built when land is prepared.

4.2.1.d. Demand for Child Labor versus Human Capital Investment

Since children still have their school vacation in August, they assist their parents in harvesting and planting. This is in addition to their traditional activities of carrying crops home from the fields and tending small stock (boys). In September when school begins, poorer households tend to keep some of their children at home a bit longer to help with farming and domestic chores.

4.2.2. Social Relations and Labor Recruitment

Independence Day at the beginning of August marks the second major annual holiday after Christmas and allows farmers to renew bonds with the friends they will hire within several weeks.

Farmers who own goats may also slaughter one for the occasion and invite relatives for a meal of curried goat with rice and peas (kidney beans) and "mannish water," a soup made from the goat's head. Curried goat is one traditional dish for such a special occasion. Beer, stout and white rum are served to men. Women generally drink soft drinks or stout.

This holiday has an especially important social function for migrants, since labor is normally difficult to find during this peak labor demand season.

4.2.3 Women's Role in Marketing and the Control of Income

The spouse of a farmer sells most of the crops. Other women who sell crops are higglers, women who are specialized traders or "intermediaries" and buy crops from farmers in their districts. Otherwise, men must rely on their daughters or daughters-in-law, their mothers or another female family member. Women, other than higglers, may be paid if they market crops for a farmer to whom they are not related. This payment may be in kind (food) or in cash. The income women earn from marketing crops for their household is used for household maintenance. Men tend to receive a portion of that income from their spouses as "pocket money."

Men who have a sufficient harvest sell their tree crops to "truck men" middlemen who buy coconuts, ackees or citrus. These men bring their own workers, who harvest and load the crop. Men also sell coffee and cocoa to marketing boards, which pay men directly in lump sums, whereby men are able to save more than women. Men's income is used generally for

household maintenance (subsistence and clothing). Women who cultivate separate crops, work off-farm or engage in petty commerce also use their income for household maintenance. There does not tend to be major conflict between women and men regarding resource allocation. If this should arise, however, one of the partners tends to leave the home. In cases in which women are abandoned and come from poor families, this produces great hardship for their children. The two non-migrant families we encountered, who were not included in our household study and who were headed by females, both had severely undernourished children.

Interestingly, women who came from wealthier households as well as women from poorer household do off-farm wage labor. Women in migrant households whose spouses did not have sufficient labor for the farm did not quit their jobs in order to farm for their husbands who were in the United States. In one instance, this led to a decline in production of carrots. Separate income and income-generating capacity were seen as being important by all the women.

It seems, therefore, that both men and women see the maintenance of the household as a major priority, since joint male-female as well as separate female incomes are used in the same manner. Moreover, women's independence is revealed

by the fact that women maintain their off-farm jobs, regardless of men's migration status, the increased labor requirements of the homestead farm, and the remittances they received.

4.2.4 Liquidity and Availability of Credit

4.2.4.a. Cash

Access to rural credit is generally limited to men. An Inter-American Development Bank/International Fund for Agricultural Development project was the only donor which provided credit for small farmers, through low interest loans to the Jamaica Development Bank through the Agricultural Credit Board. The Agricultural Credit Board would subsequently distribute the loans to small farmers through the People's Credit Bank in Morant Bay. The IFAD/IDB program was in its last year in 1987. It had also paid the salaries of a number of extension agents responsible for implementing the program. Morale was generally low among these agents, who knew that funding would soon end.

Women were able to get credit under the provisions of the program until 1986, without their own collateral. That is, they would qualify if they had a co-signer who would guarantee the loan. However as of 1987, women were required

to have their own collateral (usually land) in order to qualify. Only a few women, none of whom participated in our study, approximately four within the research area, had been able to obtain credit.

Initially, credit was to have been limited to the smallest farmers (i.e., five acres). However, the eligibility criteria were later modified to include larger farms.⁶

Farmers do not use private banks for credit. Nor are there village money-lenders as is common in agrarian societies in Asia. The only source of informal credit is the local food store or shop, where food can be bought in "trust."

Coffee was the major crop for which farmers received credit. Since men tended to own more land than women (see below), they cultivated a disproportionate share of this lucrative cash crop. Because of these institutional barriers, women were inadvertently discriminated against by the government. Women's economic position was, albeit relatively independent from that of men, less secure as a result.

⁶ Inter-American Development Bank, Kingston, Jamaica.

Personal communication, November, 1987.

There were no informal rotating credit associations. Informal rotating savings associations were limited to those begun by women's church groups. Women would usually travel to the bank in Morant Bay, the capital of St. Thomas toward the end of the week, to deposit household savings. A significant portion of farm-household income was saved (approximately 25 percent).

Men selectively worked for other male friends from whom they could borrow money when they were short of cash. They would do so even when their annual income from working for these friends was less than they would have earned working for a large farmer with whom they had a more formal relationship. However, they presumably take this into account, and consider the income differential as a form of interest on the loan.

There were therefore no indigenous institutions, besides livestock-holding, "trust," women's church savings societies and occasional borrowing through informal contractual work arrangements, which could provide liquidity.

These findings corroborate those of Pollard and Hefferman which found little formal credit activity, a high

degree of savings and off-farm earnings as an important source of liquidity.⁷

When we look at the economic situation in Jamaica during 1986-1987, we can better understand the economic behavior peasant households. The interest rate on deposits (savings accounts) in 1987 was 15 percent. Inflation in that year was 8.4 percent. Therefore, the real interest rate was 6.6 percent. Meanwhile, the interest rate on credit was between 25 to 30 percent in 1987. The interest rate on loans from the Jamaica Development Bank through the Agricultural Credit Board was only 10 percent lower, about 15 percent.⁸ Farmers also complained that the process of obtaining credit was so tedious that the cropping season was often over by the time the loan was approved.⁹ There was therefore a considerable disincentive to borrow and a considerable incentive to save.

⁷ S.K. Pollard and P. J. Heffernan Agricultural Activity and Credit Use of Small Farmers in Jamaica, in Rural Financial Markets in Jamaica. University of the West Indies Institute for Social and Economic Research, Vol. 32, No. 1, 1983.

⁸ Derick Boyd. Personal communication, April 1990.

⁹ Agricultural loans were approved on a per crop basis.

4.2.4.b. Livestock, Liquidity and Human Capital Investment

An important source of income for farmers throughout the region is livestock, which is another form of savings and investment. Small farmers of East Indian descent specialize in livestock rearing and trade and act as middlemen in transactions and in the selection of cattle.

So much livestock (goats and some cattle) is sold around September time of year, that butchers report a glut of "mutton" (goat) and beef; more than they can buy. Itinerant butchers are surrounded at slaughtering sites, and slaughter houses are crowded with farmers anxious to sell livestock. Livestock revenues go toward educational expenses and purchasing farm inputs.

Moreover, in areas plagued by drought during the months of July and August, the sale of livestock provides cash needed to purchase food, which may be in short supply. Livestock is also sold during other drought months such as March. The major agricultural season closes in December with another increase in livestock off-take and another busy livestock market as men try to ensure their households will have sufficient cash for Christmas.

4.2.5. The Organization and Use of Farm-household Time

Underlying the seasonal cycles there is a more regular weekly schedule. The beginning of the work week is devoted to work in the fields. This is labor both men and women engage in. Simple food processing such as washing, winnowing (beans), and shelling crops takes place immediately upon harvesting and is carried out by women or by women and men cooperatively. Around mid-week women begin organizing the marketing of crops, which they will do themselves, will ask a female relative to do or will negotiate with a higgler if they do not have a sufficient amount to sell in the market themselves.

Men remain working in the fields, although by Thursday, men as well as women "look loads," harvesting crops which they bag and load onto buses and trucks carrying female relatives to market. Communities on both sides of the main road between Trinity Ville and Cedar Valley and on the secondary roads, branching out from the main road into the various districts nestled further back in the hills, converge in a frenzy of activity. Deals are made, the driver of any vehicle public or private, is stopped and bags are loaded and unloaded as drivers determine how much their vehicles can carry.

Children often do not attend school and are kept at home to help on Thursdays as they are on Fridays, when attendance is not mandatory, especially in the "all-age" schools (see below). The same schedule is resumed on Fridays when women, and some men, go to market to sell their crops and to purchase food and other household necessities. Farmers use Thursdays and Fridays to go to the bank to make a deposit, which is often done by women on a regular basis, while at the market in Morant Bay. Women will sometimes make a special trip to the bank, if their transportation route does not take them through Morant Bay or they do not use that market.

On Saturday mornings men continue to farm and women are still either selling in the market or busy with domestic work. Saturday afternoons and evenings men meet in bars or around corner shops, or stop by their friends' homes, usually congregating according to age and social status.

Men drink white rum and beer as well as "Dragon" (stout), however, they prefer not (nor can they afford) to get very drunk in what is a very reserved and sober society. Women may also drink beer or "Dragon." When this does happen, dangerous fights may erupt, resulting in injuries inflicted with machetes. As one approaches more densely populated areas

and areas with higher rates of landlessness, the violence among young men increases. The highest rate of weekend emergency admissions to the Princess Margaret Hospital in Morant Bay, were due to such assaults, came from Seaforth and Trinity Ville.

Women, on the other hand, meet more regularly during the week. However, Saturday afternoons may provide some an opportunity to visit relatives and friends. Since transportation is expensive, visiting generally takes place within the same community. Many women, especially those with younger children, simply continue performing household chores or prefer to enjoy leisure time at home.

Sundays (and in some cases Saturdays) are reserved for church services. However, in a region which amply reflects the diverse denominations and religious faiths in Jamaica, only a small minority of farmers actually attend church. More women than men attend church, which provides a locus of social activity and moral support. Poorer farmers, who are virtually landless and work for other farmers during the week, use Saturdays and Sundays to work on their own fields.

4.2.6 Basic Needs

4.2.6.a. Clothing as Human Capital Investment

Poorer households also tend to keep more of their school-aged children at home during the rainy season that their shoes would be ruined (see chapter Two). As do most rural children in poor areas, those who do go to school in the rain carry their shoes while walking barefoot. Clothing is therefore an important asset in these communities. Parents who cannot afford shoes or clothing do not send their children to school.

4.2.6.b. Seasonal Demands for Health Expenditures

The rainy season is characterized by a rise in the rate of upper respiratory infections in the under-five age group. This is followed at the end of the rainy season (around December), by an increased incidence of diarrhea among children under five.

Public health problems are common just before the long rainy season. Gastroenteritis and diarrheal disease, dehydration and malnutrition, are more common among young children (under five) in the hot inland plains of the coastal zone and in poorer households.

This occurs especially during August when the heat during this season is such that water pressure in stand pipes

runs low, and streams and rivers run dry. This causes contamination and the spread of infection, which is complicated by poor diets, leading to a higher hospital admission rate for gastroenteritis, diarrheal disease and malnutrition among young children, particularly from the inland coastal plains, which are considerably warmer. Some parents, who are sufficiently educated know how to counteract these effects. One young father gave his three-year-old daughter glucose he had purchased as a rehydration fluid.

Sources of water for daily use are often contaminated, especially during the dry season. Both men and women as well as children bathe in rivers and streams. Men bathe at different times of day and in different locations than do women, with the exception of some coastal communities. In these densely populated villages, the Negro river is channelled through an old plantation aqueduct, whereby residents in must use a centralized location for bathing.

4.2.6.c. Consumption of Fuel

Most people use wood as their main source of fuel for cooking. Fuelwood is obtained in the "wood bush," an area covered with ruinate, which is designated by a community for that specific purpose. Charcoal is purchased during the rainy season. The task of gathering fuelwood is not exclusively

that of women, although they tend to take the major responsibility for it, once per week. Children as well as men carry fuelwood. Distances range depending upon the district, up to two miles.

Over the period 1985-87 as the economy declined more, poorer farmers, including women, began making and selling charcoal. We tended to find this in the southern part of the research area in Trinity Ville, and further south in Georgia, Seaforth and Danvers Pen, the coastal "landless" districts, where woodlands are depleted or no longer exist. The demand for charcoal rose in the region due to the increase in relative prices for butane and kerosene, the more expensive types of cooking fuel. In landless areas, charcoal sellers made no distinction between the types of trees used. Valuable wood sources such as cedar trees and maho plants were felled in order to make charcoal.

Women would sometimes alternate between charcoal and butane, depending on the type of food they were preparing or the stage in the cooking process (e.g., slow cooking with charcoal, then frying using a gas burner). Women cooked on old-fashioned kerosene stoves, on gas burners, on wood stoves in pantries or kitchens, and/or in outside cooking sheds

which were either separate or were attached to the back of the house.

PART TWO

FARM-HOUSEHOLD RESOURCES

Introduction. The Analysis of Human Resources and Land

In this section we focus on household labor and land. The quantity and quality (in terms of age and sex) of household labor determines the level and composition of agricultural output. We want to establish first whether there are any inherent differences in household labor between migrants and non-migrants, which would give one group an advantage over the other. Next, we explore how farmers acquire these resources through various institutional arrangements. The acquisition of extra-household labor (i.e., hired or exchange labor) will be discussed in Chapter Seven on Agriculture.

We examine the social characteristics of the two populations, describing the age and sex structure of the migrant and non-migrant groups, fertility and mortality rates, followed by household size and composition and the productive capacity of households. Finally, we examine the particular characteristics of the male and female heads of household of migrant and non-migrant populations. In this

context we discuss institutional arrangements, including to what degree unions between women and men are stable. We also review past migration trends of both migrants and non-migrant groups as it has influenced agriculture.

Our discussion of land in Chapter Six analyzes the informal and formal processes through which land is acquired. Although our selection of the non-migrant group was based upon farm size, it did not take into account differences in land tenure. As with the household, therefore, we investigate whether there are basic differences in the structure and size of holdings which would bias our results. We explore various forms of land tenure and use. We also discuss patterns of land inheritance and analyze investment in land due to migration.

Chapter 5

POPULATION

5.1. Population Size and Structure

The total sample consisted of 357 individuals, comprising sixty-two households, of which fifty-four percent were in migrant households and forty-six percent in non-migrant households. Thirteen percent of the entire population was under five years of age, seven percent in migrant households; and non-migrant households contained six percent (Table 1).

The sex ratio was even. Fifty percent of the population was male and fifty percent was female, as was also true for the economically active population. The economically active male as well as the economically active female population (aged fifteen to sixty-nine) each comprised 27 percent of the total sample.

The dependency ratio, defined as the ratio of those under fifteen and over sixty-nine to those who are economically active was 0.8, or four dependent to five economically active individuals in the population.

5.2. Comparison of Births and Deaths

5.2.1. Births

There were no significant differences among migrant and non-migrant households in fecundity (number of pregnancies), fertility (number of births) and mortality per household (Tables 1 and 2). The fertility and fecundity figures in particular imply that, at a very general level, there are no major disparities in health status among the two groups. The nineteen women who gave birth between August 1986 and July 1987, ranged in age from nineteen to thirty-six. Of the nineteen, ten were in migrant households of which six were female household heads, while nine were in non-migrant households, of which five were heads of household. Women who were not heads of household were the daughters of the male and female heads. These statistics are evidence of a high fertility rate.

5.2.2. Deaths

Most deaths occurred among those who were no longer of productive age (i.e., between fifteen and sixty-nine), except in one case in which a son of a non-migrant died of leukemia at the age of twenty-eight (Table 2). There were no significant differences in mortality.

5.2.2.a. Causes of Death

Three cases of leukemia were reported by the people who lived in this particular coastal district (Danvers Pen). One was a girl of fourteen who died in 1986. The two other cases were men who participated in our household surveys. One man of forty-four from this district was diagnosed as having leukemia during the last phase of the research. The population in this and other districts in the coastal zones suspected it was linked to the petro-chemicals they had to use in cultivating tobacco for large farmers or plantations. Contact with these chemicals caused, among other symptoms, nausea and eye and skin inflammations. Farming practices which save time, causing several operations to be done simultaneously may be a contributing factor. We witnessed a small farmer, his wife, daughters of child-bearing age and other children in a field working, while a man he hired sprayed a herbicide on the same tobacco field. Whether or not this was the cause of the leukemia, an incidence of two diagnosed cases out of the 357 individuals who comprised the research population in one year, is high. The two leukemia cases were among non-migrant men, one of whom was a male household head.

Most of the mortality was due to heart failure or massive stroke (two of the four reported deaths) among the

parents of household heads. Strokes were caused by hypertension which was fairly common among those over forty (see "Nutrition and Health", below). The wife of a migrant, in her early fifties, who had already been severely disabled due to stroke suffered a second massive stroke which caused her death. This occurred several months after the research ended and is not reflected in the mortality statistics.

Our conclusion is that, at a very general level, there were no major disparities in health status between the migrant and non-migrant households.

5.3. Household Size and Composition

There were a mean of 5.7 individuals per household in both groups, including migrants (Table 3). Migrants and non-migrants were fairly evenly matched in all age categories except males in the thirty to forty-nine year old age group, of which there were more in migrant households. This is fairly close to the 6.1 average household size reported by Miller in her rural Jamaican household expenditure survey.¹

¹ B.D. Miller, "Gender and Low-Income Household Expenditures in Jamaica," in Orlove, B. and Henry Rutz, The Social Economy of Consumption, University Press of America, 1990.

Our results are somewhat higher than the mean rural household size estimate of 4.5 persons, based on the all-Jamaica survey in 1975.² Our ratio of children (i.e., individuals under fifteen years) to adults was 0.72, whereas Miller's above-mentioned national survey reflected a higher child-adult dependency ratio, 0.97. This may have been because Miller's study focused on poor households, including female-headed households which are usually poorer, and would have more individuals and lower ratio of adults to children.

5.3.1 Changing Household Membership

One of the interesting features of migrant households was the frequent change in membership. Incoming individuals seem to be attracted to the income earned by migrants which provides more food and better living conditions.

Among the costs of migration is the risk that men may not return from the U.S., in effect, abandoning their households. Alternatively, migration entails risks for men in that women may abandon the farm-household should disagreements arise with migrants' relatives or if women do not receive adequate remittances. Two men did not return at the end of the 1986-1987 season.

² Ibid., p. 3.

One young man did not return from the U.S. after his spouse abandoned their home and moved back to her parental home due to a disagreement with his mother (a different household from the one mentioned above) and because he did not remit an adequate amount of income to her. The other man was an accomplished tradesman. When migrants "run off," they are no longer able to stay in contact with their families and provide financial support.

Two young migrants formed new households. A migrant of six years moved out of his grandparents' home upon his return, with his girlfriend who was living with her grandparents with their two sons of two and of eleven months. He moved with his girlfriend who had been living with her grandparents into the home of an aunt of his who had deceased. Another household dissolved and then reformed. A young man who became a migrant for the first time was initially abandoned by his consensual spouse before he left Jamaica. She returned to her family in a neighboring parish and sent for their three young children several months later. Upon his return from the States, he began a new household with a young woman and their newly born son. The latter example illustrates that not all changes in household composition and size are necessarily causally linked with

migration. This is a point which is often overlooked in the migration literature.³

Moreover, we had to exclude from our analysis several non-migrant households initially in this study. They were dissolved as personal disagreements caused men to move away from their mother (one case) or consensual spouses (two cases). These young men in their twenties were all non-migrants. Another moved away for purely economic reasons from his parents and his "girlfriend" (consensual spouse). He had found a job in town (Kingston). In each case, however, interviews with family members revealed that the dissolution of these families was in large measure due to economic hardship.

³ For example, Palmer suggests that a man may use migration earnings in order to depart from a multiple generation or a joint household to work toward a nuclear family economic base in order to maintain control over their surplus. However, this may simply reflect the natural evolution in the life-cycle of the household, which separates itself and stands on its own, when it has become a mature household. It may also be a combination of these two factors. See I. Palmer, The Impact of Male Out-migration on Women in Farming. Kumarian Press, 1985.

5.3.2 Household Composition and Productive Capacity

There are no significant differences in the productive capacities of seasonal migrants and of non-migrants in the 1986-87 season (Table 4). The production unit was largely made up of the primary male and female, when one compares mean production unit size to the mean number of female and male productive household members.

We wanted to determine whether the availability of adult male workers allows more migration of men. We therefore tested the hypothesis that the more males of productive age (fifteen to sixty-nine) in the household who (presumably) can take over farming for the primary male, the longer (more years) he is likely to migrate. Regression analysis confirms this hypothesis ($f = 3.25$).

In order to ensure that our hypothesis was correct, we performed a second regression in which we included male household members of all ages (i.e., we added males under 15 and over 69), ignoring the effect of productive age. This second regression analyzing the effect of the total number of "other males" in a household (i.e., omitting the migrant) on the length of migration of the male head of household was insignificant ($f = 1.29$). Another test was performed in order

to ensure that there was no selection bias, whereby the number of "other males" of productive age was, for some reason, higher in the households of men who migrated in 1986-87 than in those of men who did not migrate in 1986-87. Regression analysis proved that there were no significant differences in household composition of other males of productive age between 1986-87 migrants and 1986-87 non-migrants ($f = 0.27$; p for coefficient of current migration status = 0.60 ; $\alpha = 0.1$). Since there was no bias in our selection of 1986-87 migrant households, we are convinced that the number of males of productive age in households had an effect on migration over time.

This demonstrates that there is one major "predisposing factor" or social characteristic of the household involved in seasonal male migration: the total number of males of productive age. These results are based on the total sample of sixty-two households, including current non-migrants who had been migrant farm workers in the past. The results are intriguing because the conventional wisdom is that any Jamaican small farmer who qualifies will apply to this migration program or attempt to work in it as long as possible. Migrants hire men to replace them in their absence, hence the importance of the productive aged male component of

the rural Jamaican migrant's household has not been recognized.

Conversely, the longer a man does migrant farm work, the more he may be inclined to add males to the household, through fostering or "encouraging." In one case, a migrant who had done seasonal labor in the U.S. for over sixteen years, had adopted a young nephew of seven whom he raised along with four of his children who were still at home, two of whom were male. In another case, a nephew of seventeen, who was a poorer relative of a migrant farm worker of over five years came to live with him, mainly to tend livestock. A seasonal migrant for twelve years had, aside from his wife and five daughters, only one son of fourteen to take over his work while abroad. In these instances, length of migration affected household composition, in that the migrant expanded his household's male sex ratio by acquiring a junior male relative, even though only one of these males was of productive age at that point in time. There were three other cases, besides that of the seventeen-year-old nephew, in which housing a young male relative, as agent (see "encouraging" p. 84) was made a part of a migrant household. In each of these cases, the male household head had been a seasonal migrant for at least three years.

The result of this trend is that there are no mean differences between current migrants and non-migrants in household size and composition in the year 1986-87. There is instead interdependence between household composition and migration over time, as households with an initial adult male labor deficit attract more male household labor. (ii)

Since both migrant and non-migrant households had the same household composition and size in 1986-87, we can conclude that household composition will not be an intervening variable when we analyze the effects of migration.

5.3.2.a Agency ("Encouraging")

The "encouraging" relationship is one whereby a farmer enters into an economic arrangement with (usually) a younger man who has worked hard for him and whom he can depend upon. In institutional economics that younger man would be called an "agent" and the older man (or woman) who "encourages" him would be the principal. Through providing reliable labor the agent is able to lower the transaction costs of the farmer. In this particular context the young farmer is brought into the household (this would be a relative such as a younger brother). The transaction costs are primarily those costs which are incurred by the farmer

in seeking reliable labor. On the other hand among the extra benefits to the agent is greater freedom from parental control. Young men who are teenagers or in their early twenties may prefer to live with an older brother or sister who would give them more independence than their parents would. The case of the "encouraging" of non-kin who are extra-household labor is discussed below.

5.3.3. Characteristics of Male Household Heads

There were thirty-four migrants and twenty-eight non-migrants. Migrants' mean age was 38.5 years (Table 3). They ranged in age from twenty-one to fifty-four. Men who did not migrate ranged in age from twenty-four to sixty-nine, which was their age as of February 1, 1987 (see Research Design and Methods). Non-migrants' mean age was 42.8 years (Table 3). The difference in mean age can be attributed to the sampling technique for non-migrants, whereby a comparison group of non-migrants was selected based on land size. Migrants possessed a greater amount of land at an earlier age than did non-migrants. As a result, the only non-migrants who could be found with about the same amount of land as migrants, were those who were slightly older.

5.3.3.a. Characteristics and Farm-household Strategies of Single Migrants

It is instructive to explore the strategies single men used, since their decision-making reveals not only their resourcefulness but the major role played by women and other household members in enabling men to migrate.

There were thirty-four migrants of which five were single men at the beginning of the observation period in August 1986 (Table 5). In October 1986 one of these men, who had been a single father, was rejoined by his consensual spouse from whom he had been separated for two years. While they had been separated his eldest son had to leave school to help him on the farm. His spouse had gone to live with another man in the district who physically abused her. They were both reconciled before he left for the United States in September 1986 and their eldest son was able to return to school.

Of the four remaining single migrants, one had a son whom he supported but who lived with his ex-spouse. His younger brothers worked for him on the farm while he was in the United States. Instead of sending remittances, he paid them by allowing them to sell a fixed percentage of certain crops. A migrant who picked peaches in Canada during the other half of the year (March to September) took care of his

house for him while he was abroad. One migrant had four children who lived with their mother in his district, and to whom he sent remittances. He paid his spouse a wage for her work on the farm and for managing the female workers. His brother supervised work on his farm during his absence.

Another single migrant raised five children on his own. His wife had left him years earlier. Both his eldest daughter of twenty-one and eldest son of eighteen managed the farm and their small poultry shop for several years, while his third daughter worked in Kingston as a dress-maker. The clothes she made in Kingston were often exchanged for food crops in their village. In the meantime, this migrant's third daughter was able to finish high school (the highest form of secondary education). In 1988, after his third daughter graduated from high school, he sent his eldest daughter who had managed the farm-household very efficiently, to a teacher's training college in Kingston, and built a house for his eldest son, next to his.

The fifth was a single man in his mid-thirties, who lived with an elderly aunt. He left his farm in the hands of a woman who was his girlfriend but with whom he had not lived together and with whom he did not have any children. He no children of his own, and sent remittances home to his aunt.

When his girlfriend did not receive any remittances, she harvested the crops which were left, along with some of her family members, without giving any to the migrant's aunt, with whom he jointly owned the land. Upon his return to Jamaica, he found that he had lost his entire investment of four years in the farm and had to start anew.

5.3.3.b. Characteristics of Single Male Non-migrants

There were twenty-eight non-migrants, five of whom were single. One non-migrant was the twin brother of a migrant. Each of the four had one or more children. Each non-migrant had had children with only one woman. The women and children did not share the same farm-household with them. Three of the four supported their children and the mothers of their children regularly and one supported his child occasionally (three times a year). The fifth man raised his three-year old daughter alone, with some help from his sisters.

5.3.4 Characteristics of Female Household Heads

5.3.4.a Female Heads of Migrant Household

There were 32 female household heads who ranged in age from twenty-one years to forty-nine years of age, as of February 1, 1987 (mean age 39). Of the thirty-two women, one was the mother of a migrant who was her oldest son living at

home, another woman in her early twenties was the eldest child of a migrant (see above), and thirty women were either formal or consensual spouses. Of the thirty women, fifteen were married and fifteen were consensual spouses.

5.3.4.b. Female Heads of Non-migrant Household

There were twenty-four female household heads aged twenty-one to sixty (mean age 41). Of these women, one was the mother of a non-migrant, who was her oldest son living at home, the rest were the spouses of non-migrants. Nine women were married and fourteen, or 61 percent, were not married to the male head.

5.4. Marital Patterns

By the time men and women had reached their thirties, their unions were relatively stable. Of the fifteen migrants in conjugal units who were not married to their spouses in August 1986, two were married by July 1987. Thirteen women, or forty-two percent, were not married to the male household head in migrant households. None of the unmarried non-migrants in the sample were married during that year.

Marriages were quite expensive. One large wedding cost approximately J.\$6,000 (U.S.\$1,091). Because of the expense and the responsibilities (or liabilities) involved with inheritance, non-migrants, who were less well off, tended to

get married later than migrants. Non-migrant women tended to be more economically vulnerable as a result.

The stability of these unions is an important factor since a great deal of instability in relationships between men and women would distort any farm-household arrangements to such an extent that it would be very difficult to study the consequences of migration.

5.5. Domestic Development Cycle

Of the thirty-four migrant households fourteen were three-generation extended family households and twenty were one or two-generation nuclear households. Of the twenty-eight non-migrant households, seventeen were extended family households and eleven were nuclear households. Sixty percent of non-migrants lived in extended family households whereas forty-four percent of migrant households were made up of extended families. This difference may be accounted for in part, by the fact that non-migrant households tended to be slightly older, and their own children were becoming parents themselves while still living with the male and female household heads.

5.6. Migration Patterns

Of the sixty-two migrants and non-migrants, 34 did farm work in the U.S. during the 1986-1987 season and 28 did not do farm work during the same period (Table 5). Of the thirty-four migrants, two worked in apple orchards between August and early December 1986. One was in New Hampshire, while the other migrant worked in Virginia. Both were away during the major planting season and for a full cycle of their major crop, carrots. The major criterion for selection, namely that migrant work abroad, was therefore satisfied. Neither of these migrants were able to participate in production decisions and labor on the homestead farm while they were abroad. We therefore decided to include them in the sample.

Seven migrants participated in both the "apple" and the "sugar" migration, leaving Jamaica in August and returning in March. Two of these seven men were among those who were forced to return home when the U.S. sugar corporations retaliated against the West Indian sugar workers' strike. In Florida that year by sending several thousand home, of which several hundred were Jamaican. Both men had first worked as apple pickers and had been away four months, so they were also included in the sample.

The remaining twenty-five men went solely to cut sugar cane in south Florida, leaving between the end of September

and early November. One of these twenty-five men left for Florida in early December, along with several hundred other young Jamaicans who were participating in the farm work program for the first time. These men were "called" at the end of the year to replace those who were sent home because of the strike (see above, chapter 4). Of the thirty-four, thirty men returned to Jamaica in March and April of 1987. Two men were sent home in November 1986 due to their alleged participation in the West Indian migrant farm workers' strike.⁴

Of the total sample of sixty-two migrants plus non-migrants, twenty-nine had done farm work in the U.S. during the previous season, 1985-1986, while 33 had not migrated. Five of the twenty-nine men who had done farm work in 1985-86 became non-migrants in 1986-1987. One decided to stop farm work of his own volition and four became non-migrants because they were not recalled by the farm work program. One of these four "involuntary non-migrants" went to the U.S. for four

⁴ Wilkinson gives a vivid description of the conditions in which Jamaican migrant farm workers live in Florida and the issues involved in the strike of 1986. See A. Wilkinson, Big Sugar. Seasons in the Cane Fields of Florida. Alfred A. Knopf, 1989.

weeks to work in manufacturing in the informal economy. Another became an "internal migrant," working within Jamaica (parish of St. Catherine) for ten weeks in the spring of 1987 during the slack season, returning home bi-weekly to farm on weekends. Moreover his income, part of which was stolen in a hold up on the plantation, was not higher than that of a skilled worker in Jamaica. We therefore decided to include him in the study and define his work on the sugar plantation as off-farm wage labor.

The remaining twenty-four migrants had done farm-work at least two years consecutively, during the 1985-1986 and the 1986-1987 seasons. Ten men who did not migrate in 1985-1986 became migrant farm workers in 1986-1987. Twenty-three out of the twenty-eight "current" non-migrants (i.e., during the 1986-1987 season) did not migrate during either season.

Besides the particular year in which we observed them as a migrant or as a non-migrant, each male household head had a specific migration history, which we could not ignore, since this history may have had an influence on his present socio-economic status. We therefore also measured how many years of migrant farm work and other travel abroad men who were currently non-migrants had behind them. Cumulatively, the number of years of migrant farm work by male household heads

of both groups was 253 years, twenty-three percent of which was done by men who were currently non-migrants. We were therefore able to establish that the migrant group had a substantially larger (77 percent) migration history than the non-migrant group. Conversely, the past migration experience of non-migrants had not been so large as to distort our findings in the year 1986-1987. This applied to both seasonal and all other types of migration (see Table 5).

None of the men had traveled abroad beyond working on the plantations in the U.S., with the exception of two men. One was a non-migrant who had traveled to England in the forties and early fifties, and worked there four years. The other was a migrant who had traveled to the Caribbean for one month, after returning from the apple harvest in 1985-1986.

Women's migration history reveals that very few women traveled abroad. Of the thirty-two female heads of migrant households one had migrated once to work as a domestic servant in the Cayman Islands and one had traveled to the United States to visit her daughter. Of the twenty-four females in charge of non-migrant households, two had traveled abroad, both to England where they visited their female relatives (sisters).

There were no significant differences in migration to foreign countries of the relatives of migrant and non-migrants. This implies that there are no important socioeconomic differences in the backgrounds of non-migrant and migrant families.

5.7 Effects of Migration on Technical Innovation

Beyond contract labor programs, in which their movement was severely restricted, these farmers had therefore little experience abroad. Some farmers attended literacy courses offered by some corporations, a few adopted farming practices and brought back seed varieties from the United States. One man, while on an apple farm in Amherst, Massachusetts, had made friends with a student who conducted research on migrant farm workers.

It is noteworthy that one very well-to-do non-migrant mentioned that he had observed the agricultural techniques which were used on a New England farm on which he worked years before and had successfully applied them to his own farm.

On the whole, new techniques were not learned abroad, and attempts by migrants to use new seed varieties (carrots,

tomatoes) were unsuccessful because they were not adapted to the soils and climate of the region.

5.8 Summary Analysis

There are no inherent differences in household size and composition during the period of observation which would affect agricultural output.

We found that household membership changed over time. There was greater flexibility in migrant households with regard to absorption and release of members than in non-migrant households over the period of that year. We also found that the specific social characteristics of the household had an effect on migration over time. Past migration history of migrants as well as non-migrants, that is the total number of years men were able to migrate, depended on the number of other adult men in the household. Households with men who had migrated longer were also those which tended to have other males capable of managing the farm in their absence. This contradicts the conventional wisdom that any low-income Jamaican who is eligible for migrant farm labor will enter and remain in the BWI Alien Labor Program, as long as he is accepted.

One way by which non-migrant as well as migrant farm-households, who perceived themselves as having a labor deficit, supplemented their adult male household labor supply was by adding a family member from another household. This institutional arrangement was more prevalent among migrant households.

The importance of women's roles in migrant households is illustrated by the elaborate arrangements men without spouses needed to make in order to maintain the farm-household. By analyzing these cases, we revealed the internal mechanisms through which households adapt to and use migration. The examples of households headed by single men also illustrated the importance of the maintenance and investment in children to rural Jamaican men. This would argue against the widely accepted thesis of Jamaica as a matriarchal society in which fathers do not play a significant role in the upbringing of their children.⁵ We also begin to understand the dynamics of inter-generational transfers and "contractual arrangements," through the important roles the adult children of a particular migrant had in the maintenance of his farm.

⁵ This stems from what is widely considered to be the definitive study of Jamaican rural familial patterns, E. Clark's, My Mother Who Fathered Me, Unwin, 1957.

The domestic development cycle shows a greater tendency for migrants to have nuclear families. This may be due to a slight mean age difference, or it may indicate that adult children of non-migrants are less economically independent than children of migrants. In other words, non-migrant children must remain with their parents as adults for a longer time-period after having started a family of their own. Conversely, a father who is a non-migrant may not be able to afford hired labor, and may therefore tend to have extended family households in order to benefit longer from the labor of his adult children.

Unions between women and men tend to be stable. We can therefore assume that there is a sound basis for male and female heads to establish economic arrangements and understandings over the period before and after migration.

Migrants tend to marry earlier than non-migrants. This would support our hypothesis that migrants are able to be economically independent at an earlier age than non-migrants. However, it has even more important ramifications from the household economics perspective. From the household economics point of view, marriage to a consensual spouse would enable the migrant to secure his farm-household as well

as his own social security at a much earlier stage. Even if his migrant farm work contract were to end abruptly, he would have been able to gain a secure economic relationship with his spouse and children.

Finally, from the point of view of "innovation" and diffusion of knowledge few migrants benefited.⁶

⁶ This supports Griffith's findings based on his study of the Central Jamaican peasantry. D. Griffith, The Promise of a Country: The Impact of Seasonal U.S. Migration on the Jamaican Peasantry. Ph.D. Dissertation, Department of Anthropology, University of Florida, 1983.

Chapter 6

LAND

6.1. Land Size and Tenure

Total land size controlled by the two groups was 427.2 acres. Land "controlled" includes all forms of tenure (see Table 6). Farmers owned most of their land. Migrants owned 77 percent of their land and non-migrants owned 88 percent of their land. Twenty-three percent of migrants and 12 percent of non-migrants' land was either leased, rented or occupied. Some farmers combine different forms of tenure, that is, ownership mixed with land rental or leasing, so that farmers can expand production. Land is relatively scarce and because land remains in families over generations, and forms of tenure other than ownership introduce some flexibility into the system.

It is not uncommon for men who own land to also occupy another plot of land, if it provides additional ecological diversity for their farm. Greater micro-ecological variation minimizes seasonal risks.

"Leased" land is government land held on long-term arrangements. It is usually handed down from one generation

to the next. "Rented" land is a short-term private sector arrangement. It is land which is rented from another small farmer or a large landowner. Land which is "occupied" is government land used illegally by farmers. Land which is "used" is borrowed from friends for a specified purpose and period.

No land is given free of charge to a farmer who is not related. Three farmers were able to "use" land which belonged to friends or to large landowners, for a specified length of time. One was a migrant who lived in the coastal zone and had no land. His father had worked for a large plantation and his family was allowed to use two acres of land belonging to that plantation. The second was a non-migrant who worked as a regular day laborer for a large farmer, who allowed him to use two acres of fertile highland property for his own coffee cultivation (see "encouraging" of extra-household labor, below). The third was a non-migrant who was allowed to use a friend's land for pasture on a seasonal basis. This pasturing arrangement existed throughout the region, whereby farmers would temporarily allow free grazing on fallow land in return for manure.

We assigned a rental value to the land used by the two non-migrants, since each paid an in-kind fee for its use. A non-migrant who was involved in a multi-stranded relationship

with his employer (i.e., as a hired laborer allowed to use land) was paid five dollars less per day by his employer than the normal wage rate. This came to about J.\$750 or \$325 per acre annually, which was between J.\$50 to \$100 more than the market rental price. Although the extra cost may have taken into account the good quality of the land, this would have made him a tenant, if not for the fact that he were able to work as a free agent for other farmers. We assigned a normal annual rental value of J.\$150 to the land used as pasture by the other young farmer, based on about three-quarter acres per season, for a total of two seasons.

Many farmers occupied government land for pasture. We assigned no rental value to occupied land. Mean land value was \$4,393 per acre. However, land prices vary depending on the demand from within that community or from outside (investors); its access to feeder or to major roads; its quality depends on whether there is "water" on the land (a stream or spring), it is located in a village or a busy commercial center such as Seaforth.

Leased land (from the government) cost about J.\$21 per acre per year, however, rented land was generally within the range of J.\$50 to J.\$150 in 1986 and 1987.

Non-migrants did not occupy any land, while migrants occupied a total of four acres. In conclusion, we do not see significant differences overall in mean land size in any of the above forms of land tenure between migrants and non-migrants.

6.2.Land Inheritance

Land was typically inherited upon the death of a parent or an older relative who had reared the male or female head of household. Land tended to be inherited by men, who share it with women or extended family members who have use rights to portions of the land or to specific crops (e.g., tree crops). Land which was reported to us as being owned was either already inherited by men or would be inherited in the future.

It would seem from our interviews that inheritance rights are often contested, particularly between women and men. One man who intended to migrate for the first time in 1986 reported that although he owned ten acres, he had to share part of it with his sister and her spouse. He planned to use his earnings abroad to buy an additional amount of land for himself. Clearly, this is not an instance in which the migrant was an impoverished farmer who needed to augment agricultural output through land purchase, but a farmer who

was relatively well off in local terms. The purchase of land would enable him to release himself from the obligatory land arrangements he maintained with his relatives. He evaluated the benefits of migration both qualitatively as well as quantitatively.

Specific circumstances dictate whether women inherit. For instance, the number of male relatives who supported the elderly relative. Men as well as women reported the amount of land women inherited, indicating that men considered women's land ownership important. Men also included it in total farm size. There were a total of five women who had inherited land, four non-migrants and one in a migrant household. Three non-migrant women were over forty, one in her mid-twenties. The spouse of the migrant was in her late forties. The minimum amount of land inherited was two acres, the maximum ten. Mean land inheritance of women in non-migrant households was 4.8 acres. The spouse of the migrant inherited two acres. Total acreage inherited by women was 21.5 acres or six percent of all land owned. Consequently, female inheritance does not play a significant role in the economy.

6.3 Land Purchasing Patterns

There are no significant differences between migrants and non-migrants in land purchasing patterns (see Table 7).

This pattern does not change when controlling for outliers. However, the probability that there are no significant differences does increase markedly for land purchased before 1985 (from $p = 0.3443$ to $p = 0.9842$).

Since some non-migrants have done farm-work in the U.S. or Canada in the past, they may have acquired more land through purchase than those non-migrants who never migrated. Should this be the case, we will have demonstrated that there is a clear association of land accumulation with migration. Our hypothesis was that the more years of farm work by the male household head, the more land he would have purchased in 1986 or in 1987, regardless of his migration status.

We report below the regressions of land size purchased in 1986, then in 1987, and migration status. Migration status (i.e., migrant or non-migrant) was controlled for: (1) by performing regression analysis on the entire sample of households ($n = 62$) with migration status and total years farm work as independent variables; and (2) by performing regression analysis separately on the non-migrant ($n = 28$) and migrant ($n = 34$) groups with total years farm work as the independent variable. Regression analysis of the full sample examines the change from non-migrant to migrant status.

Two landless farmers acquired land in 1986, both had been migrants in 1985. However, one who purchased 0.8 acres, stopped migrating at the end of the 1985-1986 season, while the other, who purchased 0.4 acres, continued.

6.3.1 Land Purchasing Patterns of All Farm-households

Model 1 (land size purchased in 1986: migration status 1986-87):

R-square = 0.2635

$$Y = 0.003 - 0.056 X_1 + 0.012 X_2$$

(p=0.87) (p=0.05) (p=0) alpha

of coefficients = 0.10

model 1 is therefore:

land size purchased, 1986 = - 0.056 migration
status1986-87 + 0.012 total years farmwork (i)

This reveals that the more men became migrants in the 1986-1987 season, the less land they were likely to purchase before leaving (i.e., in spring/summer 1986). However, the more they had done farm work, the more land migrants purchased that year. Both variables had a fairly weak predictive value for land purchased in 1986 and 1987. No other systematic effects could be found, however. We can interpret this as demonstrating that there was very little

The total acreage controlled by the farm household had no effect on the amount of land purchased in 1986. Due to the small size of the average farm (five acres), and that part of the land which is held in communal ownership, most farmers will prefer to purchase more land, regardless of the total amount of land they "control" (because of the tenure arrangements described above).

Model 3 (land size purchased in 1987: migration status '85-'86: controlling for land size)

We tested the hypothesis that having become a migrant in 1985-1986 caused a farmer to purchase more land the following year (in 1987). R-square = 0.0156

$$Y = 0.008 + 0.034 X_1 + 0.002 X_2 + 0 X_3$$

(p=0.86) (p=0.64) (p=0.78) (p=0.68) (iii)

X_1 (migration status '85-'86) X_2 (total years farm work) X_3 (total land size) alpha for the coefficients = 0.10 This regression is insignificant.

Model 4 (years farm work: land purchased in 1986):

We decided to test the hypothesis that farm work history (i.e., total years of farm work) contributed to land purchased in the spring/summer of 1986, controlling for

farmers' migration status the previous season (October 1985 - March 1986).

R-square = 0.2262

$$Y = - 0.013 - 0.03 X_1 + 0.01 X_2$$

(p=0.51) (p=0.37) (p=0) X_1 is

migration status 1985-86 alpha for the

coefficients = 0.10

model 4 is therefore:

land size purchased, 1986 = 0.01 total years farm work

(iv)

The coefficient of migration status in 1985-86 was insignificant ($p = 0.37$). The only determinant of the amount of land purchased in 1986 was the number of years a man had done migrant farm work. The more years a man had done migrant farm work, the more likely he was to purchase land in 1986. The question as to whether or not he was ultimately chosen to do farm work later that year was unimportant, since his decision-making was guided by his expectation that he would again migrate.

6.3.2 Comparison of Non-migrants with Migrants

For land purchased in 1986 by non-migrants in 1986-1987,

R-square = 0.4699:

$$Y = - 0.2172 + 4.801 X_1 \quad (p=0.3)$$

(p=0.0001) alpha for the coefficient =
0.10; the model is therefore:

land size purchased, 1986 = 4.801 total years farm work
(v)

This demonstrates that past migration, specifically, the total number of years in farm work, did have a significant influence on the amount of land that had been purchased in 1986 by the current non-migrants.

Land size purchased in 1986 by migrants in 1986-87 was not as strongly influenced by their previous years of farm work.

migrants (R-square = 0.1722):

$$Y = - 0.1934 + 0.0645 X_1 \quad (p=0.8)$$

(p=0.0147) alpha for the coefficient
= 0.10

or:

landsize purchased, 1986 = - 0.1934 + 0.0645 total yearsfarm
work (vi)

Another variable, "total land size owned" (in contrast with total land "controlled"), was included to determine whether land tenure, specifically the amount of land owned,

had significantly influenced current non-migrants in purchasing land in 1986. Non-migrants in the October 1986 - March 1987 season (i.e., "current non-migrants") were chosen because these non-migrants would have had sufficient time to purchase land.

The less land owned, the more land would be accumulated by men who had not migrated in 1986-87 but had done farm work in the past.

Non-migrants (R-square = 0.4853)

$$Y = - 0.0323 + 0.2427 X_1 - 0.0356 X_2$$

(p=0.9) (p=0.0001) (p=0.3946) X₂ is

total land size owned

alpha for the coefficients = 0.10

therefore the model is:

land size purchased, 1986 = 0.2427 total years farm work (vii)

The amount of land owned by a non-migrant was insignificant, however, the longer a current non-migrant had done farm work, the more he was likely to purchase land in 1986.

Our conclusion, based upon the above analyses is that total years migratory farm work was the overriding factor in determining whether land was purchased.

6.4. Summary Analysis

Our findings show no fundamental differences in land size of different tenure between farm-households of migrants and non-migrants. We can now proceed to analyze the data on agricultural output, since we have established that we have controlled for the important intervening variables.

While allowing some fluidity in land-holding, when we consider the scarcity of fertile land in this region, we find inherent contradictions in the traditional land tenure system. It allows for access to land for a large number of people, and for a variety of mutually beneficial accommodations. However, since most farmers do not own titles, land disputes are not uncommon. We observed these disputes particularly between men and women. Women's land tenure is less secure, as they tend to inherit use rights, except under special circumstances. This is evident in the insignificant amount of women's land inheritance.

Migration becomes a way of overcoming these obstacles. Migrants' earnings are used to purchase land in order to ensure ownership. Even those migrants who own more

significantly more land will purchase an additional amount, if it is available. Land ownership, therefore, did not play a role in land purchases, while migratory history did. This effect was weak because there was insufficient land available for purchase in the region.

PART THREE

MIGRATION and THE FARM ECONOMY

Introduction

We examine in Chapter 7 on agriculture, whether circular migration of Jamaican small farmers leads to agricultural decline. We do so by examining the mean output levels of total agricultural production and the output of the major food and cash crops cultivated. The sales and consumption patterns of these crops are investigated, based on migratory status and region. We focus our attention on starchy staples, their consumption and sales as a result of migration and income.

We also explore the use of inputs. We assess whether there are differences between migrants and non-migrants in hired and exchange labor, and in the use of inputs such as seed, plants and chemical fertilizers.

Finally, we evaluate whether seasonal and annual cropping shifts change with migration, and if there's a trend toward specialization with migration. This includes women's specialization.

Chapter 8 explores general levels of livestock output and sales, followed by a detailed investigation of changes in stocks (assets) and income flows for large and small livestock.

Based on our ethnographic study of the role of livestock in household maintenance and reproduction, we believe that income from migration will permit migrants to purchase more livestock than non-migrants.

We will also explore the role of livestock-holding in households with children.

Chapter 7

AGRICULTURE

7.1 Agricultural Diversity

Agricultural output in the lowlands as well as in the highlands of western St. Thomas, Jamaica, is based on a large variety of crops, which we have classified into nineteen major and forty-five "other" or minor crops (see Tables 8 and 9).

7.1.1 Total Agricultural Output

There were no significant differences between migrants and non-migrants in the mean value of total agricultural output (Table 10).

We tested whether length of migration affected current gross agricultural output. However, it had no effect. Current agricultural output equalled J. \$ 3,3963.

total migrant agricultural output = 3936 (i) (p = 0)
alpha for the coefficient = 0.10

Hence, current agricultural output is not less after several years of seasonal out-migration when compared with output of men who never migrated.

7.1.2 Mean Annual Output per Crop

7.1.2.a. Perennials

There were no significant differences in coffee, cocoa and pimento cultivation (see Table 8 and analysis in Appendix 1). Perennials output volume and value of migrant farms do not decrease relative to non-migrant. Ackee, an important food tree crop, harvested semi-annually, did not decrease due to migration.

7.1.2.b Annuals

Annuals with a growing season of from six weeks to three months are called "catch" crops, because they allow farmers to earn cash quickly if the season is right (the growing season as well as the market price when it is harvested). They are very labor-intensive crops, requiring a considerable amount of careful weeding by women. Migration did not affect carrot output, one of the major cash crops. Mean carrot output was not significantly different for migrants and non-migrants. Mean tomato and pumpkin output were not significantly different.

There were also no significant mean differences in "condiments" output. Scallion and thyme output did not decline with migration. Thyme has a growing season of about

six months but can be harvested at different times of the year.

When we compared legume output of men who were away part of the year with that of men who remained on their farms, we found significant differences in only one crop.

Migrants had significantly higher mean red pea output than did non-migrants. Since only a very small number of migrants cultivated red peas, we believe this may be due to their greater ability to hire labor (see below).

Otherwise, there were no significant differences in broadbean or in gungo output. Gungo is the primary women's crop (see Table 11 and Appendix 1). There was no increase in gungo peas cultivation among migrant women, as we had anticipated.

There were no significant differences in output of important vegetables such as chochos, a type of squash which is cultivated by women.

7.1.3 Staples

We define staple crops as starchy staples, which are used on a regular basis in the diet. We do so in order to

distinguish them from other food crops. There were no mean differences in output of renta and st. vincent yams, bananas and breadfruit, the major staples.

We tested whether length of migration, that is, years of seasonal migrant farm labor, would have an impact on the current (i.e., in 1986-87) output of staples. However, it had no effect (see Appendix 1). We therefore reject the notion that migration leads to a decline of staple food crops at the farm-household level. There were also no significant differences in sweet potato output of migrants and non-migrants.

7.1.4 Minor Crops

The total output of minor crops, that is, annual and perennial crops of less economic and dietary significance for the population in that region as a whole, did not change as a result of migration. Mean output of minor crops was not less for migrants than it was for non-migrants.

7.2. Gross Output, Sales and Consumption

There were no significant differences in mean annual sales and consumption of crops between the migrant and non-migrant populations (see Tables 8, 10 and 12, and Appendix 2).

There were significant regional differences in mean coffee, carrot, thyme, cocoa and plantain output, consumption and sales. We also find regional differences in gungo pea, red pea and pimento output and sales. Coffee, cocoa, pimento and thyme tend to be grown more in forest zones. Carrots are grown on sandy soil, and primarily in the district of Somerset (see community description, chapter 3). Plantain is grown primarily in the coast on flat land. There were no significant differences in banana output, consumption and sales, perhaps because bananas (i.e., green, boiled) are a major staple food in western St. Thomas.

7.3. Factors Affecting Staples Output

When we looked into the factors affecting the sale and output of major staples (i.e., renta and st.vincent yams, sweet potatoes, bananas and breadfruit), we found that income did not have a significant role. However, the number of children (i.e., farm-household members under fifteen years) did have a significant effect ($p = 0.0263$) at a significance level of 0.10.

R-square: 0.1971

major staples output = 7121.98 + 1690.86 under-fifteens
(ii)

This was true for migrants as well as non-migrants. No other systematic influences could be found.

There were no significant differences in the marketing of the majority of staples. However, migrants appear to have sold a higher percentage of their cocoyams (44% vs. 26% for non-migrants; $p, \text{coco sold} = 0.0508$) and corn ($p, \text{corn sold} = 0.0393$), while non-migrants sold a higher percentage of their breadfruit crop ($p = 0.0051$).

7.4. Inputs

7.4.1 Labor and Land Input for Selected Cash Crops

The crops for which we have been able to collect accurate data on both land size and labor inputs are coffee, carrots, as well as gungo peas, the latter being both an important cash and food crop (Tables 11 and 16). It is usually difficult to estimate land size because of intercropping. However, farmers reported the land size for these crops fairly accurately even when they are cultivated in more than one mixed stand. This may be due to their importance as revenue earners.

The standard labor input measures the number of personhours it would have taken to cultivate one acre of a

crop. The labor input ranged from 432 personhours per year for coffee (new stands were being planted) to 501 personhours for gungo peas. This seems plausible, given Edwards' estimate of a standard yearly labor input of 582 personhours per acre (when intercropping) for St. Thomas.¹

Land size allocated for these crops ranged from an estimated mean of one-half acre for coffee to one acre for carrots among migrants; from seven-tenths of an acre for gungo peas to nine-tenths of an acre for carrots among non-migrants. The small size of the holdings probably limit the amount of land which can be allocated to important cash crops. Coffee alone would require at least five acres to produce sufficient economic returns per year.²

¹ This is a general estimate per acre. Edwards did not estimate personhours per crop. See D. Edwards, *An Economic Study of Small Farming in Jamaica*, University of the West Indies Institute of Social and Economic Research, 1961.

² (2) Ministry of Agriculture Soil Survey. Personal communication, 1982.

7.4.2 Crop Input Expenditures

There were no significant differences in total crop input expenditures, as a result of migration (Table 17).³ Migrants as well as other farmers reported that their spouses or that junior males did not possess sufficient technical knowledge to manage the complicated task of using inputs such as fertilizers, pesticides or herbicides on delicate friable soils. Male household heads were concerned that without their personal supervision, these inputs would be applied incorrectly, the crop would be "burned" and they would lose their entire investment in the crop for that season. Agricultural extension personnel, consisting of three men for the entire region (in Cedar Valley and in Trinity Ville), were insufficient to provide adequate technical assistance to spouses and relatives of migrants during their absence.

Small farmers in this region, the majority of whom practiced hillside agriculture, were generally reluctant to apply artificial chemicals, which most of them felt were harmful. Even peasant farmers who were better off did not invest much more of their income in labor-saving inputs than

³ Migrants purchased more coffee seedlings. This was not analyzed separately. These results will be reported at a later date.

did the others. This is evident in the similarity of the results when the larger peasant farmers ("outliers") are omitted.⁴

Migrants also did not purchase significantly more total seed and plant material than did non-migrants. Farmers relied primarily on their own stock from cuttings (e.g., yam "heads") and seedlings they had cultivated in nurseries (or "beds") themselves. Small farmers often received inputs free of charge from relatives or friends. Input expenditures went primarily toward coffee and carrot cultivation and toward banana and plantain cultivation in the coastal zone.

7.4.2.a Seasonal Aspects of Non-labor Input Expenditures

Migrants often reduced multiple cropping schedules for "catch" crops from two or three crops to one crop per year (e.g., carrots). On the other hand, they were able to invest more per season for certain annuals, in order to maintain yields. The majority of migrants who pursue this strategy seem to have as their aim greater seasonal efficiency in production. However, they also risk greater losses.

⁴ These "outliers" appear in several tables. This was done in order to determine that they were not significantly different from the other farmers. Both were non-migrants.

The average investment in tools did not change with migration. Simple tools, such as machetes, forks, hoes, "picka" (pick axes) and files are used. Employing additional labor would not require an added investment by the migrant, since his exchange and hired laborers bring their own tools with them.

7.5. Extra-household Labor

The cost of hiring either men or women (see Table 19) is defined as the annual expenditure on hired labor for the cultivation of major cash crops. Hired labor for "other" cash crops includes annual expenditure on both male and female labor.

Male hired laborers are primarily selected from among the men with whom the migrant exchanges labor while he is in Jamaica. Female hired labor is selected by the female head of household. The male head chooses men who are his friends or who have a reputation for hard work.

There are significant differences between migrants and non-migrants in the composition and utilization of labor from outside the farm-household. The total value of hired and exchange labor is higher among migrants than among non-

migrants. Male hired labor is the most common form of labor used, even more so than exchange labor.⁵

The majority of hired and exchange laborers are in their twenties and thirties; however the ages of male and female workers range from the late teens to the late thirties. Had there been high outmigration of this particular segment of the population, there would have been a severe labor shortage. Even without a regional labor shortage, many farmers did not have sufficient access to labor, since labor costs were high. Between the fall of 1986 and the summer of 1987, the cost of male labor went up about twenty percent. Migrants hired more labor than did non-migrants, because this was a high increase relative to income.

Migrants hired more male labor for major crops; they also hired more labor for "other" or minor crops. There are no findings from the early fifties and demonstrates that there has not been a significant change in production relations since then. Peasants did report, however, that exchange labor had declined since the early eighties. significant differences in other forms of labor between

⁵ This corroborates Edwards' (op. cit.)

migrants and non-migrants. Clearly, male hired labor is intended to substitute for the male head while he is abroad.

It is surprising, however, that there are no significant differences in male exchange labor between migrants and non-migrants. We would have expected that, with their higher incomes and with less time for farming, migrants would have used significantly less male exchange laborers than non-migrants. This may be due to migrants' investment and consumption priorities for their migration income that was left after they returned.

Seasonal factors also play a role. When migrants return in March and April, labor requirements on farms are relatively low and exchange labor is available. In August, as the peak season approaches and they must use larger amounts of labor to prepare land, migrants tend to hire labor in addition to working with some exchange laborers.

There are no significant differences in female hired and exchange labor. The female exchange to female hired labor ratio reveals that households which hire female labor do not engage in female exchange labor. It would seem these households are those of single men or are households which are better off.

Relatives of the male head as well as those of the female head (father, mother, brothers) often assist at different times during the year. Migrant women reported that especially the male relatives of the migrant helped them while he was away. The support from male relatives outside the household did not decrease with seasonal migration.

7.5.1 Agency ("Encouraging") of Extra-household Labor

In this case, the principal lowers his transaction costs by finding a reliable worker, which saves him the time of finding and negotiating a wage on a seasonal basis with a worker.⁶ The agent receives extra remuneration, such as a two-acre plot of land.

The agent is generally a younger male friend or acquaintance of the principal. In the case of an in-kind payment in land, the principal is usually a wealthier farmer

⁶ J. Ensminger, The Persistence of Poverty in an Otherwise Highly Contractual Labor Market among East African Pastoralists, Draft (November), 1989.

See D.C. North, Structure and Change in Economic History, Norton, 1981.

(who earns approximately U.S. \$9,000 a year in farm revenues).

This is a different production relationship from those described in the literature on the Jamaican peasantry and we were surprised by its prevalence in western St. Thomas. Some forms of agency may be described elsewhere as tenancy. However, agents have the option of working for other farmers. As we asserted above (Chapter Four), it is considered a special relationship and reported separately from other labor arrangements by the principal as well as the agent. For example, a man may employ several hired workers along with the agent and pay them the same wage. However, the principle notes that his relationship with his agent is closer.

This labor arrangement is particularly suited to migrants' needs. From the analysis it appears that migrants have a higher frequency of agents than those who do not go to the U.S. (Table 19).

7.6. Regression Analysis of Agricultural Output

The opportunity cost of exchange labor was estimated as being equal to the wage (see above). Extra-household labor input is the total value of wage labor and the opportunity cost of exchange labor for that year. The value of capital

(farm equipment) is negligible. We decided to use the amount of land controlled by the farm-household, as opposed to land value since such factors as land tenure and communal land use would have to be taken into account for each parcel of land.

The following Cobb-Douglas production functions were estimated:

$$Q = A \cdot \text{Land Size}^{a(1)} \cdot \text{Seed, etc.}^{a(2)} \quad (\text{iii})$$

Normally a partial estimation of labor would not be used. However, we decided to add extra-household labor to the equation instead of using total labor, that is, household labor plus labor from outside the household (see above).

$$Q = A \cdot \text{Land Size}_{a(1)} \cdot \text{Extra-household Labor}_{a(2)} \cdot \text{Seed, etc.}_{a(3)}$$

(iv) We transform each equation to a logarithm for the purposes of regression analysis.

$$(\ln Q) = A + a_1(\ln L) + a_2(\ln \text{seed, etc.}) \quad (\text{v})$$

and with extra-household labor:

$$(\ln Q) = A + a_1(\ln L) + a_{Pv2}(\ln \text{Labor}) + a^3(\ln \text{seed, etc.}) \quad (\text{vi})$$

Whereby "Q" stands for output, "A" for a constant, "a" for the coefficient alpha and "ln" for the natural logarithm to the base "e" (approx. 2.71828). In the first regression of this production function: Y stands for ln Q, X^1 stands for ln L and X^2 for ln Seed, etc. In the second regression: Y stands for Q, X^1 stands for ln L, X^2 stands for ln Labor and X^3 stands for ln Seed, etc.

Model 1 : a) for non-migrants (R-square = 0.4640):

$$\ln Y = 6.83 + 0.36 X^1 + 0.28 X^2$$

$B^0 = 6.83$ (p, $B^0 = 0$) $B^1 = 0.36$ (p, $B^1 = 0$) $B^2 = 0.28$
(p, $B^2 = 0.02$) alpha for the coefficients = 0.10 The model is therefore:

ln output value = 6.83 + 0.36 total land size + 0.28 seed, etc. (vii)

With extra-household labor:

a) for non-migrants (R-square = 0.4646):

$$\ln Y = 8.49 + 0.37 X^1 - 0.20 X^2 + 0.29 X^3$$

$B^0 = 8.49$ (p, $B^0 = 0.40$) $B^1 = 0.37$ (p, $B^1 = 0$) $B^2 = -$
0.20 (p, $B^2 = 0.86$) $B^3 = 0.29$ (p, $B^3 = 0.03$)

alpha for the coefficients = 0.10

Therefore, model 1 for non-migrant output is:

\ln output value = 8.49 + 0.37 total land size - 0.2
extra-household labor + 0.29 value seed, etc. (viii)

b) for migrants (R-square = 0.3937):

$$\ln Y = 7.57 + 0.43 X^1 + 0.10 X^2$$

$$B^0 = 7.57 \quad (p, B^0 = 0) \quad B^1 = 0.43 \quad (p, B^1 = 0)$$

$$B^2 = 0.10 \quad (p, B^2 = 0.35) \quad \alpha = 0.10$$

The model is therefore:

\ln output value = 7.57 + 0.43 total land size + 0.1
seed, etc. (ix)

with extra-household labor:

b) for migrants (R-square = 0.4016):

$$\ln Y = = 5.38 + 0.40 X^1 + 0.27 X^2 + 0.09 X^3$$

$$B^0 = 5.38 \quad (p, B^0 = 0.13)$$

$$B^1 = 0.40 \quad (p, B^1 = 0)$$

$$B^2 = 0.27 \quad (p, B^2 = 0.53) \quad B^3 = 0.09 \quad (p, B^3 = 0.38)$$

$$\alpha = 0.10$$

therefore, model 1 for migrant output is:

\ln output value = 5.38 + 0.4 total land size + 0.27
extra-household labor + 0.09 seed, etc. (x)

When the production of all six regions (i.e., sub-
regions), that is the entire sample of thirty-four migrant
and twenty-eight non-migrant households, is analyzed, we find

that land and inputs such as seed and plants were significant in determining non-migrants' output, while land was the only factor which determined the output of those who had migrated. In other words, extra-household labor was not significant in determining output for either the migrants or non-migrants in western St. Thomas as a whole. For migrants, seed and plants were also insignificant.

We conclude from the above that household labor was a significant factor in determining the value of output of migrants and non-migrants. We will examine this further below (see analysis of output of subsample). On the other hand, the above findings predict that if non-migrants increase their land size by ten percent, there would be a $(.37 * 10\% =)$ 3.7% increase in output. The model also predicts that with a ten percent increase in the value of mainly seed and plants and/or other inputs, non-migrants will have a $(.29 * 10\% =)$ 2.9% increase in output. On the other hand, migrants could increase output by $(.40 * 10\% =)$ 4%, if they increased land size by 10%. It would seem that migrants' strategy of focusing on purchasing more land in 1986 (see land purchasing patterns, Table A.6.) is justified.

Given the land shortage in western St. Thomas, it is difficult for non-migrants to acquire more land. An increase

of ten percent in seed and plants would give non-migrants almost the same output and an increase of thirteen percent in seed and plant expenditures would give the same value of output as they would have had they increased their land size.

The reason seed and plant inputs were insignificant to the agricultural output of migrants was because, as a whole, they were able to purchase sufficient inputs for the year. Fewer migrants reported not being able to purchase sufficient inputs than did non-migrants (fifteen percent of migrants compared with eighty-nine percent of non-migrants).

When regression analysis was performed on the entire sample (62 farm-households), with migration status as the independent variable, first excluding extra-household labor (a) and subsequently controlling for this variable (by including it in the model) (b), we discovered that migration status had no significance at $\alpha = 0.10$ (p, coefficient of migration status (a) = 0.54; p, coefficient of migration status (b) = 0.83).

Model 2 (without landless farmers):

We decided to test whether controlling for farmers in the landless zone who were themselves landless or virtually landless would produce different results. The landless zone

in the coast is made up of two sub-regions, Region 4 (Bailey's Piece and Georgia) and Region 6 (Seaforth and Danvers Pen). The regression was performed omitting this group, producing significantly different results:

a) for non-migrants (R-square = 0.6762):

$$\ln Y = 5.59 + 0.32 X^1 + 0.16 X^2 + 0.32 X^3$$

$$B^0 = 5.59 \text{ (p, } B^0 = 0) \quad B^1 = 0.32 \text{ (p, } B^1 = 0.02)$$

$$B^2 = 0.16 \text{ (p, } B^2 = 0.06) \quad B^3 = 0.32 \text{ (p, } B^3 = 0.01)$$

$$\alpha = 0.10$$

\ln output value = 5.59 + 0.32 total land size + 0.16 value outside labor + 0.32 value seed, etc. (xi)

b) for migrants (R-square = 0.4591)

$$\ln Y = 7.25 + 0.36 X^1 - 0.05 X^2 + 0.25 X^3$$

$$B^0 = 7.25 \text{ (p, } B^0 = 0) \quad B^1 = 0.36 \text{ (p, } B^1 = 0.02)$$

$$B^2 = -0.05 \text{ (p, } B^2 = 0.74) \quad B^3 = 0.25 \text{ (p, } B^3 = 0.05)$$

$$\alpha = 0.10$$

therefore, model 2 for migrant output is:

\ln output value = 7.25 + 0.36 total land size - 0.05 extra-household labor + 0.25 value seed, etc. (xii)

When the landless zone was omitted, we see that all the factors of production specified in the original model (land size, outside labor, seed and plants) have a strong effect

in determining the output of non-migrants. In contrast with model 1, we see that the value of output of farmers with some land who farm throughout the year in Jamaica and do not use labor to substitute for their own is strongly affected by the value (i.e., quantity) of the additional labor they are able to mobilize from outside the household.

Model 2 also demonstrates that the output of migrants who own land is influenced by the value of seed and plants, in contrast with model 1 which includes migrants who do not own land. However, the probability of there being no significant influence of extra-household labor input rose from 53% (p, B², model 1 for migrants = 0.53) to 74% (p, B², model 2 for migrants = 0.74) when migrants who were landless were excluded from the analysis.

Model 2 predicts that should non-migrants increase land size or their expenditures on seed and plants by about ten percent, they would increase output by (10% * 0.32 =) 3.2%. Whereas, if non-migrants increased outside labor by 10%, they would only increase output by about half as much as migrants (10% * 0.16 =) 1.6%.

If migrants with land would increase their expenditures on seed and plants by 10%, they could increase their value of

output by $(10\% * 0.25 =) 2.5\%$. If migrants invested 15% more in seed and plants, they would be able to increase output by about the same as if they had increased land size by 10%, that is, by $(0.36 * 10\% =) 3.6\%$. We believe we are picking up the effect of household labor in the marginal productivity of seed and other non-labor inputs, since the output increases by more than we would normally expect. This is an omitted variable bias.

Land expansion is important to output in both models (i.e., the marginal product of land is higher than to other inputs). Expansion of land gives small farmers, especially those practicing hillside farming, greater control over output by allowing shifting cultivation, over a wider range of micro-ecological environments and allowing soil to regenerate.

We chose model 2, which has greater predictive value, with an R-square of 67.6% for non-migrants, compared with 46.5% for model 1, and an R-square of 45.9% for migrants compared with 40.2% for model 1.

7.7 Regression Analysis of Staples Output

Our hypothesis was that there were two main factors which would influence staple food output: land size and the

total number of children under fifteen. Land size is an important factor since the major staple crops consume a considerable portion of land. Yam hills (or mounds) as well as banana and plantain stands use up sizable amounts of farm land because they must be planted a certain distance apart. Mature breadfruit trees are also fairly large with low-hanging widely spread branches.

Farmers would report that as more children were born and their families grew they decided to expand staple crop production. We have seen above that small farmers do not respond to the proportion of children to adults in households but to the absolute number of children, that is, household members under fifteen years of age. We therefore decided to test whether the total number of household members under fifteen would affect output value of the major staple foods.

a) for non-migrants (R-square = 0.1308):

$$Y = 5357.75 + 66.57 X^1 + 502.69 X^2$$

$B^0 = 5357.75$ (p, $B^0 = 0.1861$) $B^1 = 66.57$ (p, $B^1 = 0.0656$)

$B^2 = 502.69$ (p, $B^2 = 0.5976$) $\alpha = 0.10$

the regression model:

staple output = 5357.75 + 66.57 total land size + 502.69 under-fifteens (xiii)

b) for migrants:

$$Y = - 1745.93 + 101.29 X^1 + 2707.02 X^2$$

$$B^0 = - 1745.93 \text{ (p, } B^0 = 0.52) \quad B^1 = 101.29 \text{ (p, } B^1 = 0)$$

$$B^2 = 2707.02 \text{ (p, } B^2 = 0) \quad \alpha = 0.10$$

the regression model:

$$\text{staple output} = - 1745.93 + 101.29 \text{ total land size} + 2707.02 \text{ under-fifteens (xiv)}$$

Interestingly, non-migrant staple food output was only affected by land size, whereas migrant staple food output was significantly influenced by both land size and the total number of household members under fifteen. Migrants are able to gear all major staple food production to their number of children while non-migrants. No other systematic effects were observed.

7.8 Changes in Cultivation: Cropping Shifts, August 1986 October 1987

The net change in allocation of seed and plants, or in land, were used as measures for estimating crop shifts (Table 20). Changes in land allocated was used as a measure if farmers could not accurately report seasonal changes in seed or planting material used.

Overall, there are few significant differences in shifts in cultivation when comparing migrants with non-migrants. Of the twelve crop categories, only two reveal significant differences in production/allocational shifts between migrants and non-migrants. As a whole, migrants and non-migrants appear to be responding similarly to market signals as well as to institutional obstacles to investment: poor transportation and marketing mechanisms, insufficient agricultural extension.

Coffee was the only crop for which investment was really being encouraged in the region, through incentives such as loans. It was also the only crop for for which there were significant differences in allocational shifts. During 1986-87, non-migrants were rapidly expanding resources allocated to coffee compared with migrants, as measured here by land and other non-labor inputs. Since non-migrants were unable to earn a large amount of wage income, they may have been more interested in expanding coffee cultivation.

The staple food production patterns of the two groups are surprisingly similar. There are, in general, no significant staple food declines among migrants and non-migrants, except in sweet potatoes, for which migrants have significantly more negative shifts than non-migrants whose

resource allocation evidently remained constant. The sweet potato is a secondary staple as well as an important cash crop (see Tables 12 and 15). Migrants' higher incomes and their greater ability to substitute own-produced for purchased staples, allow them more flexibility in shifting resources toward or away from the less important staple crops.

7.9 Specialization and Diversification of Crops

Crop specialization and complexity are measures of the extent to which migrants and non-migrants pursue different economic strategies. Specialization is measured by the proportional output of each crop to total crop output. Diversification, or complexity, is measured by the sums of the squared crop specialization indices.

7.9.1 Crop Specialization and Crop Complexity

The extra income migrants earn could allow them to focus on major cash crops, as opposed to devoting resources to staples, other food and minor cash crops. Non-migrants may need to pursue a strategy of crop diversification since they are more vulnerable to market forces. In other words, the more complexity, the less risk.

There was a significantly higher degree of specialization in carrots and red peas by migrants (Table 21). This may be due to greater access to inputs on a seasonal basis and a strategy of focusing on the cultivation of a short-term cash crop for which the marketing and distribution is fairly simple. Carrots are sold directly to the Agro-Grace corporation in districts or marketed wholesale by men's spouses in Kingston (see above).

Non-migrants seem not to specialize in any of the high value cash crops. On the other hand, non-migrants did specialize more in minor cash and food crops, namely in pumpkins and "other" (minor) crops than did migrants.

7.9.2. Women's Crop

We have seen in the analysis of variance above (Table 8.d.) that there are no significant differences in gungo peas specialization, the major women's crop, between migrants and non-migrants.

We also wanted to test the hypothesis that the more migrants' gungo peas output, the less their coffee output since gungo peas is clearly a "woman's" crop and coffee a "man's" crop. This is based on the idea that with women's greater responsibilities upon migrants' departure, women will

focus on crops they can earn income from themselves. However, the more women in migrant households devote time to "their own" crops the less time they spend maintaining the crops of migrants who are abroad. Regression analysis reveals that migrants' gungo peas specialization has no effect on coffee specialization.

7.10 Summary Analysis

There were no significant differences in agricultural output volume between migrant and non-migrant households. In other words, migrants' farm-households were able to maintain annual agricultural output levels. According to our theory, we can then expect to see greater farm-household consumption expenditures that reflect human capital investments.

There was also no difference in the mean annual value of output between the two groups, which means that prices at which migrants sold their crops did not vary significantly from those at which non-migrants sold theirs. Any differentiation in output was due to sub-regional specialization based on ecological differences.

There were no significant differences in sales and consumption of crops. From these results we can infer that if migrant households had produced significantly less output for

consumption than non-migrant households, they would have had to use migration income to fill a consumption deficit. In this case, we have shown that migration does not lead to a decline in food crops. Therefore, should migration income be allocated to purchasing food, it will be to raise levels of food consumption.

When the production of staples of all farm-households (migrant plus non-migrant) is initially analyzed, the number of children has a weak but significant influence on the output of the major starchy staples they consume. Further analysis demonstrates that among migrants, the output of major staples is dependent upon the number of children in the household, whereas among non-migrants the number of children has no effect. Our conclusion is that migrant households respond (i.e., gear food output) to the number of children in their household while non-migrants do not.

The pattern of input use does not change with migration. The only significant difference between migrants and non-migrants is in the use of male hired labor, with migrants hiring more. Regression analyses show that male hired labor has no influence on agricultural output of migrants, while it does on that of non-migrants. Based on these results we conclude that male hired labor is used primarily as a

substitute for the migrant's labor on the homestead farm. Migrants' hiring of male labor does not represent a change in peasant social relations since hiring is an established practice among small farmers. There is an important regional difference in input use. Extra-household labor has no effect on agricultural output in landless areas, while it does among those in economic-ecological zones where farmers control land.

The marginal product of land are higher than to other inputs. This is the consequence of the low level of technology applied to farming because of the ecologically sensitive environment and little technical support. Therefore, small farmers' investments in agriculture are primarily in land.

Migration causes cropping shifts toward greater specialization in major cash and food crops. Non-migrants specialize more in minor cash and food crops, which shows a tendency toward greater cropping diversification among non-migrants.

There are no differences in the value of output between "migrant" and "non-migrant" women in specializing in gungo peas, the major women's crop. This effect may have been

masked by the amount of gungo peas they produced for men. However, there were no significant differences in the number (absolute frequency) of women's crops between "migrant" and "non-migrant" women (Table 28). This implies that "migrant" women did not have a greater value of output of their own crop and that migration did not cause differentiation in gender-specific cropping patterns. Women's independent economic activities in agriculture continued, regardless of migration.

Chapter 8

LIVESTOCK

8.1 Gross Livestock Output and Sales

The highly seasonal nature of economic crops makes livestock a valuable resource to small farmers (see Chapter 4). Our main goal is to investigate whether migrants invested more in livestock than non-migrants.

With more disposable income (see Chapter 10), migrants have the choice of saving all their cash in a regular interest-bearing savings account or investing some of it in livestock. By 1986-87, inflation had been declining in Jamaica for two years. Saving in interest-bearing accounts became more attractive (Chapter 4). However, livestock was perceived by the peasantry as a way of diversifying investments in order to minimize risk.

8.1.1 Hypotheses

We expect migrants to invest more in livestock as a way of accumulating capital (Table 23). Non-migrants, who are cash-poor, will invest less in livestock. However, since they are more dependent on livestock for cash income, they will

sell more of the stock they do own in order to alleviate seasonal cash-flow problems.

Migrants may lose more stock than non-migrants. While they are abroad, those left in charge of livestock often manage them less efficiently, in part due to the low returns to labor. Cattle often slip and fall from steep slopes, "hanging" themselves on rope by which they are tied to trees because of a lack of grazing land. Migrants' families also have less technical knowledge and skill and/or access to agricultural extension agents, whom must sometimes assist in more technically specialized work such as calving.

8.1.2 Definitions

The value of livestock output in one year is measured by the change in stock from the beginning to the end of the year plus sales. We measure this change in livestock assets as income. One component of the change in assets is sales (Table 22).

8.1.3 Analysis

8.1.3.a General Patterns

Upon examining the results, we find that migrants' and non-migrants' gross total livestock output and sales are not

significantly different. Non-migrants do not sell significantly more livestock than do migrants. Despite their lower incomes, non-migrants do not invest less in livestock than do migrants. We believe livestock substitutes, to some degree, for income from seasonal wage migration (see below).

Our results show no significant differences in expenditures, changes in inventory, assets, and losses among migrants and non-migrants for small or large livestock.

8.1.3.b Specific Patterns

Hypothesis

Although there are no significant differences in the value of total output between these groups, there may still be significant variation between them with regard to particular types of livestock.

Analysis

Cattle income and assets were not significantly different. There was only some difference in the sale of pigs, with migrants having higher mean annual revenues (J.\$79). However, small stock was not an important component of total livestock assets.

Farmers stopped raising pigs between 1984 and 1986, due to the higher price of feed (J.\$7 per bag, an increase of 25%). Pigs of some younger and poorer farmers died because they did not feed them adequately. Pigs were also more susceptible to dangerous infections (e.g., balantidium coli) than were cattle, fowl or goats.

Small farmers report that the returns on their investment in pigs is fairly high, since they regularly produce large litters and can be more easily managed by women (pens can be built near homes). The interest women as well as men had in pig-raising was revived, when the wholesale price of pork in the region rose in early 1987 by fifty percent (\$5 per pound wholesale). They often slaughtered piglets themselves in order to take advantage of this higher wholesale price. Possibly, the reason non-migrants did not sell pigs is because they wanted to expand their stock.

The stock of poultry (common fowl) remained relatively stable because farmers wanted to maintain stocks in order to consume the eggs. Fowl were rarely sold. Farmers reported slaughtering a rooster occasionally because it ate the eggs or because it was difficult to maintain several roosters simultaneously in one flock.

There were no differences in goat sales and stocks with migration. One important feature of this peasant economy is that goats exchanged a gifts among extended family members and close friend. Stocks may not have shown significant changes because families who had a "sufficient" number of goats would give them to others who did not. The definition of "sufficient" varied, depending upon the circumstances (disposable income, the need of the recipient). Some goats were also used for private consumption.

8.2.The Role of Livestock in Household Maintenance and Reproduction

8.2.1 Composition of Household (Children)

The sale of livestock (cattle, goat and sometimes pigs) in August and September is used to pay for education. As a result, households with larger numbers of children (i.e., under fifteen) may hold more livestock. We tested the hypothesis that the more children a household contains, the greater the income from livestock. This hypothesis was rejected.

We also tested that the ratios of children to productive adults would affect sales or assets of different types of livestock. The regressions were insignificant.

We then tested whether the amount of livestock owned depended on the amount of land owned. However, we found that the amount of land owned was insignificant. Perhaps this was because small farmers used government owned land or land which belonged to their friends.

We tested that household composition (ratio of under-fifteens to productive members) and the amount of land owned would increase the value of livestock assets. Regression analysis showed that these factors had no effect on livestock-holding.

However, the livestock sales were influenced by the number of children in the farm-household. Regression analysis reveals that the total number of household members under fifteen had a significant but weak influence on cattle sales among both migrants and non-migrants.

8.2.1.a Livestock versus Off-farm Wage Employment in Jamaica

Another variable was added to this regression, the off-farm non-migration (wage) income of men, to test the hypothesis that cattle is used a substitute for wage migration by non-migrants. If this type of income were a

substitute, it would have a negative effect on cattle sales. In other words, the more men tend to earn off-farm income in Jamaica, the less they will tend to sell cattle.

Off-farm wages earned in Jamaica by non-migrant men had a slightly negative effect on cattle sales. Off-farm wages earned by migrants in Jamaica were a fairly small proportion of their gross annual income (see Table A.23.) and therefore had no effect on cattle sales.

For non-migrants (R-square = 0.1778):

$$Y = 128 + 185.34 X^1 - 0.06 X^2 \quad (p=0.05) \quad (p=0.10)$$

(alpha = 0.1) the model is therefore:

$$\text{cattle sales} = 128 + 185.34 \text{ under-fifteens} - 0.06 \text{ male off-farm income} \quad (i)$$

For migrants (R-square = 0.1518):

$$Y = - 219 + 223.82 X^1 + 0.08 X^2$$

(p=0.03) (p=0.24) (ii) alpha for

the coefficients = 0.10

the model is therefore:

$$\text{cattle sales} = - 219 + 223.82 \text{ under-fifteens} + 0.08 \text{ male off-farm income} \quad (iii)$$

This demonstrates that it is not the ratio of child dependents to adults. It is the total number of child dependents that influences farm-household decision-making.¹ It also demonstrates that cattle sales take the place of wage earnings and therefore of wage migration.

We decided to investigate whether the off-farm income of women (all female household heads) would have the same effect on cattle sales by adding their off-farm Jamaican earnings to those of men. When the regression analysis was performed with the sum of both male and female off-farm income earned in Jamaica and the number of household members under fifteen as the dependent variable, it appeared that adding women's income was neither significant for the cattle sales of migrants nor did it affect cattle sales of non-migrants.

This gives us further evidence that men's and women's incomes are separate and not interchangeable. Furthermore, in

¹ This may be an argument against the fixed-coefficient analysis using adult equivalents. Some discussion of this issue can be found in A.C. Kelley, "Population Pressures, Saving and Investment in the Third World," Economic Development and Cultural Change; Vol. 36, No.3, pp. 451-452.

the case of off-farm income, men's and women's incomes are sometimes used for separate but complementary purposes: men provide school books; women provide "lunch money."

In this instance, adding women's off-farm earnings does not affect household decision-making as to how much cattle is sold. Since cattle sales are usually targeted for major educational expenses (i.e., children's books and clothes) and investment in the farm, it appears women's income does not play an important role in these major investments. This is not to suggest however, that women's off-farm income does not play a role in daily school expenses such as transportation and the costs of food, since interviews with women show that a large amount of their income (farm and off-farm) is invested in this manner.

For non-migrants (R-square = 0.1361):

$$Y = 49.38 + 188.10 X^1 - 0.03 X^2 \quad (p=0.06)$$

(0.27) X^2 is off-farm income

$$\alpha = 0.10$$

the model is therefore:

$$\text{cattle sales} = 49.38 + 188.10 \text{ under-fifteens} - 0.03 \text{ off-farm income} \quad (\text{iv})$$

For migrants (R-square = 0.1349): $Y = -246.79 + 225.5 X^1$
 cattle sales = -246.79 + 225.5 under-fifteens
 (v) (p=0.03)

We can infer from these results that non-migrants as well as migrants respond to children and the lack of other sources of cash, by selling cattle. Furthermore, they respond to the absolute number of child dependents rather than to the ratio of child dependents to adults (those over fifteen). This is perhaps because child dependents are ultimately the responsibility of the household head(s), regardless of the number of adults in the household.

8.2.2 Household Composition (Men)

Finally, we decided to investigate the effects of another aspect of household composition, that is, the sexual composition of the household. We observed that the extent to which a man owns cattle seemed to depend upon whether he had access to a sufficient number of males. Rarely would a man be hired for tending cattle, since the returns to cattle in the short-term, are fairly low. However, in one case in which there were insufficient junior males of productive age who were interested in tending livestock, an agent was engaged. This man had his own cattle and tended cattle

belonging to the principal in return for free housing, in a small cabin in the front yard of the farmer's house.

Based on our finding that household decision-makers respond to the absolute rather than the relative number of individuals, we decided to test the hypothesis that the larger the number of males in the household, the more cattle would be held (i.e., the larger the cattle assets). Since migrants reported accumulating cattle over time, we added the total number of years engaged in farm work to the model, our hypothesis being that the longer the male head performed farm work the greater his cattle assets. This would be the case whether or not he were a current migrant who had done farm work before.

$$\begin{aligned} \text{Non-migrants (R-square = 0.043): } Y &= 3574.18 - 582.88 \\ X^1 &+ 340.49 X^2 \quad (\text{vii}) \\ &\qquad\qquad\qquad (p=0.54) \qquad\qquad\qquad (p=0.32) \end{aligned}$$

alpha for the coefficients is 0.10.

The model is insignificant.

Migrants (R-square = 0.4464):

$$\begin{aligned} Y &= 3646.31 + 1448.48 X^1 + 623.99 X^2 \quad (p=0) \\ &\qquad\qquad\qquad (p=0) \end{aligned}$$

alpha for the coefficients = 0.10

The model is therefore:

cattle assets = 3646.31 + 1448.48 other males + 623.99
years farmwork (viii)

Interestingly, the total number of "other males" in a household, that is, men of all age-groups, did not affect the value of cattle owned by non-migrants. However, it did affect the value of cattle owned by migrants.

The number of years of farm work did not affect the value of cattle held by non-migrants, either. In comparison, migrants clearly accumulated cattle proportionate to their number of years in wage migration. The second model confirms our hypothesis for migrants. The more males in a household, the more migrants are able to hold cattle. Migrants rely more on men in their household than non-migrants do in this regard.

8.3. Summary Analysis

Migration has no effect on gross annual livestock income, output and sales. There were no differences between migrants and non-migrants in total livestock expenditures, assets and losses.

There was only a difference in pig sales, with migrant farm-households selling more. Otherwise, migration caused no

differences in the types of livestock held or sold. This was in part due to the use of livestock products (eggs) to supplement the diet. However, in most cases, farmers held on to livestock as a form of savings and investment. This means that conditions were fairly stable in the economy. Had they not been, we might have seen a higher amount of sales, especially among non-migrants.

There was an interesting relationship between household composition and cattle ownership. This was reflected in the results of our regression analysis. The more children in the household, the higher the cattle sales. Both migrants as well as non-migrants seem to sell cattle based on their number of children, which would lead us to conclude that cattle are used for investing in human capital through education. This conclusion is also based on our interviews with small farmers. Furthermore, farmers' decisions seem to be based on the total number of their children, not on the ratio of children to adults. In other words, only two adults were responsible, the male and female heads, regardless of the number of children.

The total number of males of productive age in migrant households also affected the number of cattle which were

held. Therefore, migrants may not own cattle unless they have enough adult men to tend them.

Off-farm wage labor of non-migrant men had a negative effect on cattle sales. Clearly, revenues from the sale of cattle were used as a substitute for wages.

PART FOUR
INCOME AND WEALTH
and
THE WELFARE OF WOMEN AND CHILDREN

Introduction

This section explores the manner and extent to which seasonal male migration ultimately changes the socio-economic character of households. The amount of income earned by farm-households containing either migrants or non-migrants, the disposal of migration income based on economic-ecological zone, and the cash savings and wealth of these farmers are described in Chapter Nine.

Chapter Ten discusses the effects of differential levels of income and wealth. We focus on whether greater income gives greater access to the "basic human needs" consumption such as food, clothing, shelter, and education. To these measures of welfare we add leisure time. We therefore examine changes in farm-household time-allocation with migration.

In Chapter Eleven we focus on access to food. We analyze household food expenditure patterns and anthropometric measurements of children and adults under eighteen years of age to see whether nutritional status changes with migration.

Chapter 9

INCOME AND WEALTH

9.1 Farm-Household Income

Farm-household income sources were composed of the following. Agricultural output was the major source of income for non-migrants. Migrants as well as non-migrants earned some income in Jamaica. Both men and women had independent income sources in Jamaica through wage labor or petty commerce. The major portion of migrants' income earned abroad was used in Jamaica and was an important source of income for their households.

9.1. Income Earned in Jamaica

There are no significant differences in total household income from farming (total revenue from crops sold) or in mean total off-farm income (Tables 12, 13, 23, and 24). Our results for the mean crop revenues are approximately the same as those of other farmers in the region, according to an agricultural extension agent. Mean monthly revenues from agriculture in the region fall between J.\$600 and J.\$750.

When we look into the off-farm income component of earnings in Jamaica, we find no significant differences

between "migrant" and "non-migrant" women. This provides further evidence that female heads of migrant household pursue an economic strategy independent of men's income.

Non-migrant men's off-farm incomes are significantly higher, however, than those of migrants. Most migrants do not have enough time to earn income in Jamaica, although they will take on such odd jobs as carpentry or work as a hired laborer for a larger farmer, during the slack season (July to early August).

Male off-farm income within Jamaica was almost exclusively in wages, since men rarely became independent entrepreneurs. One man had a small concession business as a part-time beverage and snack vendor before migrating for the first time. One of the reasons migrants earn lower wages while they are in Jamaica is due to the redistributive mechanisms within these peasant communities.

Public works jobs and day labor jobs on farms are given to non-migrants by community leaders and small farmers, respectively. They did so in order "to give them (non-migrants) a chance to also earn some money." Those migrants who were relatively less well off and were virtually landless, were somewhat annoyed by this.

9.2. Migration Income and Its Disposal

Migration income is defined as the total income earned by a migrant farm worker in the United States. Men's U.S. earnings are usually targeted for specific purposes. Rather than examining the percentage of migrants' income allocated for a particular purpose (paying school fees, constructing a home), we examined how much of the cost of each item was financed by migrants' U.S. earnings.

It can be argued that it does not matter whether migration income or whether income from another source is used for a particular purpose. If a migrant invests more of his U.S. wages in his farm, he will earn more cash which, in turn, enables him to finance consumption expenditures indirectly.

The problem with this rationale is that peasants usually separate income from different sources rather than considering it as one large pool of income. This was evidenced by the separate effects of women and men's income on cattle-holding in the above chapter.

We can understand this type of economic behavior from the point of view of the time value of money, the amount of

income, and risk-averse nature of farmers with low incomes. The timing and size of returns to farm investment is often difficult to project when a small farmer is unable to get technical advice (agricultural extension) and has difficulty marketing his crops.

An examination of regional differences in spending remittances and remaining migration income, reveals that migrants in certain zones used significantly more income for food (Table 23). Although this particular statistical analysis does not reveal what zones these were, we know from our interviews that these were the landless zones, Regions Four and Six (i.e., sub-regions within western St. Thomas). These are both coastal landless areas. Migrants who were (virtually) landless peasants, with about one acre used more of their U.S. earnings for purchasing food than those who had some land.

Female household heads received the bulk of remittances and remittance schedules were usually regular. This would mean that the contractual arrangement between spouses was sustained throughout the migratory season. Furthermore, these findings may also partially explain why agriculture was maintained.

9.3 Cash Savings

Migrants did not have higher cash savings than did non-migrants. Migrants had much higher levels of consumption. Their expenditures were almost twice that of non-migrants (see below). Landless migrants used most of their earnings for household consumption: education, food, clothing and shelter. These families needed to live on income earned in the U.S., after deductions and remittances, from the time men returned to Jamaica (end of March 1987) until they returned to the United States and men could resume their remittances (around early December 1987). These men were, for all practical purposes, wage laborers who maintained subsistence farms and grew plantains for sale.

9.4. Wealth (Assets)

Total household assets of migrants and non-migrants are approximately equal to one year's gross income (Table 26). The value of vehicles migrants own is greater than that of men who do not migrate. This was due to a migrant's higher expenditure on maintenance (approx. J.\$3,000). Only one migrant owned a car, which he used as a taxi, and two owned motorcycles. One non-migrant, who had done migrant farm-work several years earlier, owned a small van.

Housing is an important asset. Migrants spent a total of approximately J.\$ 100,000 for constructing new homes, between 1982 and 1987. These homes were often purchased with some land, allowing them to expand production. None of the non-migrant men were able to construct and complete new homes during that period. One non-migrant had been able to partially build a home, on which he spent J.\$7,000 over three years. He had been trained as a carpenter and a mason, and had built most of it himself.

Building a modern concrete block home meant that families could store crops better and protect crops, and themselves, from rats carrying typhoid. Better storage also enabled farmers to save time in harvesting, since there were less post-harvest crop losses. Housing can therefore not simply be considered "unproductive" and as a form of consumption.

Correspondence with families after Hurricane Gilbert in 1988, revealed that migrant families were able to provide shelter for those (non-migrants) whose houses had been destroyed. The investment in housing clearly enables migrants to protect the health and welfare of their families.

Chapter 10

MIGRATION, FARM-HOUSEHOLD ECONOMICS AND
THE WELFARE OF WOMEN AND CHILDREN10.1 Levels and Patterns of Consumption

The quantity and types of food consumed and the consumption of other goods allows us to examine whether the form of consumption increases the welfare of women and children in migrant households.

10.1.1 Estimated Value of Food Consumed

There are no significant differences in the estimated mean value of food consumed per person per meal. However, based on this gross estimate, it would seem as though migrant households consume food worth about a dollar more per meal (Table 29). This estimate also masks seasonal differences in food consumption. We provide a more detailed food expenditure analysis below (Chapter 11).

10.1.2 Migration, Household Expenditures and the Quality of Life

Migrants have significantly higher mean household expenditures than non-migrants. Electricity, clothing

(including shoes), food and "other" household expenditures of migrants are also higher.

There were no significant differences in mean household expenditures on rent and home repair. Many farmers rent homes because the housing stock is very limited. This makes it difficult for them to repair it themselves except with the permission of the owner, who may be in Kingston or abroad. Migration did not lead to higher expenditures on water. Expenditure on water depends on the accessibility to piped water in the district, migrants' higher incomes may not have any effect. The extent to which farm-households have access to potable water is an important determinant of nutritional status. The frequency with which women or caretakers of young children wash their hands has an effect on the spread of viral and certain human or animal enteric bacterial infections, as well as other parasites.

Yet, many farmers who had piped water in their yards used the river for bathing. This allowed them to save on the water bill but also promoted greater spread of diseases such as typhoid in some districts. Often, a farmer's income (e.g., through migration) does not play a role in whether he has piped water or indoor plumbing. This depends on the number of people in the district who make a request via the Parish

Council to the NWC (National Water Commission). It may take several years before residents who have made this request are supplied piped water.

Other amenities, such as indoor plumbing depend on whether a farmer owns his home. It also depends on the individual small farmer. In 1987, a small farmer could put in indoor plumbing for between \$J. \$4,000 to J.\$5,000. This is approximately equal to farmers' mean annual savings (in deposit accounts). Migrants can therefore not afford this expenditure. The problem of maintaining indoor plumbing further deters these households making this investment.

Migrant households did not use private physicians more than non-migrants. Hypertension and eye ailments due to infection and injury were the reasons given for seeing a private physician, for which the cost of a visit plus medication would cost between seventy to one hundred and forty dollars (1987 dollars). Most men avoided seeing a physician, unless they suffered an acute illness or it was related to medical screening for farm work in the United States. Migrant women were more able to attend clinics themselves or with their children. These female heads of migrant household visited private physicians more regularly than female heads of non-migrant household.

10.1.2.a Consumer Items

Migrant households use refrigerators as a means of starting a business managed by the female head, usually out of her living room or pantry. They usually sold soft drinks or beer, and sometimes chicken backs or chicken (Table 28).

Refrigeration has an added benefit in that it can improve families' diets. They can use a greater variety of fresh foods, including fresh milk. We do not have information on whether migrant households who owned refrigerators were able to improve their diets.

10.1.2.b Consumption Expenditures and Children's Welfare

Migrants can provide better education for their children. One of the main aims of these small farmers is to give their children a good education. Those who can afford to provide their children adequate food (at home plus "lunch money" for school), clothing, books, electricity (as opposed to having to study by kerosene lamps or before nightfall) do so without reservation. Education is perceived as the only way of improving one's economic opportunities, for both men and women. While sons may inherit the farm, women may move away to Kingston or other towns to work in clerical or other

positions. However, education is also considered valuable in and of itself.

School costs do not reflect actual education expenses (see Table 25). Jamaican children enjoy public education, so initial expenses (books, supplies) are relatively smaller than recurring expenditures. These are mainly reflected in the purchases of clothing and food. Migrants' children had significantly more clothing for school than those of non-migrants, based upon our interviews. Expenditures on children's clothing were between 50 percent and eighty percent of migrants' expenditures on clothing. This was the same for non-migrants. Non-migrants did not report having enough "lunch money" or enough cash to buy shoes and clothing in order to send their children to school. About forty-percent of non-migrants reported having to keep their child(ren) out of school several days a week, for this reason. A non-migrant's spouse asked us for financial help in order to buy shoes for their children, whom they did not send to school for this reason. "Without travelling (migrant farm work) nothing can work," she wrote.

Migration gave children access to better education. More children of migrants had secondary education than did children of non-migrants.

Two non-migrants with sufficient collateral (land) were able to get loans: one for agriculture and another, in order to pay his daughter's school examination fees. This latter was a former agricultural extension officer who had been laid off. It may have been difficult for other non-migrants to get a loan from a commercial bank for this purpose. Importantly, migrants did not apply for loans from private banks that year.

We investigated whether better education would also translate into better employment status for migrants' children. We divided employment into six levels or statuses. Level One is rural or urban unemployed status. Level Two employment status consists of landless laborers, bakers and others who engage in petty commerce. Small farmers and higglers comprise Level 3 employment status. Skilled full-time (more than 51% of the year) crafts- and tradesmen such as carpenters, masons, factory workers, and taxi or bus drivers have Level 4 employment status. Level 5 employment is defined as clerical work or shop-keeping (as store owner). Level 6 is defined as professional employment such as teaching, nursing or agricultural extension. The results were as follows.

a) Of the nine non-migrants who did not migrate in either the 1985-86 or 1986-87 seasons, with adult children, seven each had one adult daughter. Of these seven adult female children, three had Level 1 employment status, three had Level 2 employment status and one had Level 3 employment status. In other words, of the adult female children 42.9% were unemployed, 42.9% were landless laborers, bakers and/or engaged in other petty commerce; and 14.2% were higglers.

Of these nine, four had adult male children. Two non-migrants had three adult male children with Level 1 employment status. One adult son had Level 2 employment status and one adult son had Level 3 employment status. Therefore, 60% of adult male children were unemployed, 20% were landless laborers or engaged in petty commerce and 20% were farmers.

b) Two current non-migrants who were migrant farm workers in the U.S. during the previous season (1985-86) had adult children. Neither of these two men had adult daughters. Their three adult sons had the following employment levels: two had Level 3 employment status and one had Level 6 employment status, or 67% were farmers and 33% were professionals (in this particular case, a teacher).

c) Of the seven migrant households with adult children, six had adult daughters; two had adult sons. There were a total of seven adult female children, one had Level 1 employment status (14.2%), four had Level 3 employment status (57%), one had Level 4 status (14.2%) and one daughter, Level 6 employment status (14.2%). Of the two adult sons, one had Level 4 employment status (50%) and one had Level 5 employment status (50%).

Our comparison shows that the only farmers whose children advanced beyond their own occupational status (Level 3), were men who had done migrant farm work in the U.S. during 1986-87 or had migrated in 1985-86. The evidence suggests that adult children of migrants tend to advance their socio-economic position more than those of non-migrants.

Migrants whom had just retired from seasonal U.S. farm work the year before, and their spouses, reported that their adult children gave them financial support of some kind. Some adult children would give regular support to their fathers and mothers. Others, who had migrated abroad, would pay the travel expenses for their parents to visit them. Older non-migrants did not report receiving any support from their children

10.2 Farm-Household Time-Allocation

10.2.1 Women's Time-Allocation The mean number of labor hours spent by women in agricultural and domestic labor was 44.30 hours per adult equivalent for migrants (see Table 27). Non-migrant women devoted significantly more time to agricultural and domestic tasks, a mean of 74.46 hours per adult equivalent per week, nearly twice that of migrant households.

Our examination of women's leisure time shows that migrant women were able to enjoy more than twice as much leisure time (53.22 hours) as non-migrant women (23.06 hours). From interviews we learned that migrant women had more leisure time available to help other women with child care (bathing and feeding), cooking and other tasks.¹ Women in migrant households also spent leisure time helping their children with their homework, especially their arithmetic.

¹ Our study revealed that these kinds of inter-household transfers of income took place regularly among women who were either related, or who were friends or business partners as "partners" (higglering). The inter-household transfer most frequently reported by women was cooked food, then followed uncooked food (i.e., crops just harvested), and child care.

Leisure time was also used simply for leisure. One woman, along with her husband who had just returned, visited her sister in the parish of Manchester for several weeks.

10.2.2 Welfare as a Function of Household Composition and Labor Time

We investigated whether household labor-time of women would be determined by the total number of household members under fifteen and by total gross income. The more children in the household, the more labor-time women spend in domestic and agricultural activities. The more total annual gross income is earned, the less labor-time must be spent by women in domestic and agricultural activities.

a) for non-migrants (R-square = 0.0718):

$$Y = 74.01 + 1.11 X^1 - 0 X^2 \quad B^0 = 74.01$$

(p, $B^0 = 0$) $B^1 = 1.11$ (p, $B^1 = 0.49$)

$B^2 = - 0$ (p, $B^2 = 0.56$) alpha = 0.10

b) for migrants (R-square = 0.7285):

$$Y = 41.4872 + 10.9646 X^1 - 0.0006 X^2$$

$B^0 = 41.4872$ (p, $B^0 = 0$) $B^1 = 10.9646$ (p, $B^1 = 0$)

$B^2 = - 0.0006$ (p, $B^2 = 0.05$) alpha = 0.10

The predicted model is:

labor hours = 41.4872 + 10.9646 under-fifteens -0.0006
income

From the above we can conclude that our assumption did not hold for non-migrants, but that it did hold for migrants. This may have been due to the fact that, as we have seen above, migrant women have more flexibility over their labor hours. As we have seen above, male and female heads of migrant households gear their resources, particularly their labor and leisure time, to their children's needs. In contrast, non-migrants are unable to organize their time in this manner.

This illustrates an important point. Not only do migrant households have more disposable income and leisure time, overall they are more able to plan their time according to children's needs. Migrant families produce more staple foods and sell more cattle, the larger their number of children. Women in migrant households spend more labor time the more children they have, but slightly less labor as farm-household income increases. We will investigate whether there are other benefits from migration, when examine food consumption, below (Chapter 11).

Chapter 11

FOOD EXPENDITURES AND NUTRITIONAL STATUS

11.1 Food Expenditures

We analyzed food expenditures annually and on a weekly basis.

11.1.1 Annual Food Expenditures

We estimated food consumption for the entire sample of migrants and non-migrants' households. These consisted of thirty-four and twenty-eight households, respectively. Food consumption (i.e., available for consumption) is defined as food from purchase and from own-production. Own-production of food for consumption is derived from the value of annual gross output less the output which is sold. Inter-household transfers of food were not taken into account.

Migrants' annual food purchases were significantly more than non-migrants', although the difference was not large. However, total food available for consumption was about the same for the two groups. We conclude from these findings that migration of male heads does not lead to greater access to food.

The absence of large differences in food purchases between migrants and non-migrants seems to indicate that both groups are, in effect, substituting purchased foods for foods they sell. However, in some households this may make up for a deficit in own-production due to migration and/or due to landlessness. This corresponds to Low's¹ results from southern Africa, where small farmers used their income from agriculture to purchase food which, in turn, saved labor time in cultivating food crops.

We analyzed food available for consumption per adult equivalent for an average meal. We did not find significant differences in the monetary value of meals per adult equivalent (Table 29).

Although we did not find any significant differences in total food available for consumption, there could have been differences in the quality of food. An intensive survey of a smaller number of households was undertaken to investigate this possibility.

¹ A.C. Low, Agricultural Development in Southern Africa. Farm-household Economics and the Food Crisis. Heinemann, 1986.

11.1.2 Weekly Food Expenditures, February - April 1987

We analyzed the daily food expenditures of a stratified random sample of eleven migrant and twelve non-migrant families during the season migrants were abroad. This study was conducted between February and April, the last months migrants were abroad, to allow for an initial adjustment period after remittances began arriving in December.

Based upon these daily expenditures, we analyzed the data on a weekly basis, desegregated into three food purchasing groups and into twenty-seven food items or categories (Table 30). These findings show no significant improvement in the quality of food purchased at household level with migration.

Migrant households purchase significantly more of eight food items rich in calories, fat, and sodium, out of a total of twenty-seven. The only exception is fish. Mean migrants' expenditures on fish are about twice that of non-migrants. Nine migrant households purchased an average of J.\$3.56 of fish per week. Although fish is a good protein source low in fat, the particular type of fish purchased, dried and salted fish, would have mixed benefits for health, since it contains a large amount of sodium which might contribute to high blood pressure.

Migrants purchase significantly more bread, mostly hard dough bread, and rice, both of which are high in carbohydrates. Migrants' families also spend significantly more on sugar, soft drinks and condensed milk than do non-migrants.

It is interesting that they do not spend significantly more on regular milk instead, even though the Serge Island Dairy in Seaforth district had a milk vendor who regularly distributed fresh milk by bicycle to the districts in the region. This would indicate a general lack of nutrition knowledge. On the other hand, some families reported that the reason they did not buy Serge Island milk was because it soured quickly.

Migrants' significantly higher purchases of soft drinks represents, in part, the extra cash spent by their school-aged children for lunch (i.e., "lunch money"). As we noted above, non-migrants generally had less "lunch money." They tended to keep their children out of school on the days on which they could not send them to school with it (see Chapter 10).

Families of migrants also spend significantly more on margarine. This is consistent with our results for expenditures on bread and with our dietary survey findings which showed that margarine is generally used as a spread and is not used for cooking.

Chicken noodle soup mix is popular as a seasoning for stews, however it is expensive, about J.\$1.85 per package. Miscellaneous food items which are usually purchased to a lesser degree and can be considered luxuries, such as oatmeal or coffee, were purchased more by migrant households than by non-migrant households.

The analysis above only reflects general household level patterns, it does not provide information on the expenditures of households based on their composition and size. We controlled for these factors in Table 31 by using adult (consumer) equivalents as we had in Table 29.

When we examine mean weekly food expenditures a different pattern emerges. In addition to the eight food items that were mentioned above, migrant households spent significantly more per adult equivalent on meat, that is, beef, salted pork or goat ("mutton") and on chicken backs, than did those of non-migrants.

Migrants also spent significantly more on counter flour, a coarser wheat flour than regular flour, which is used alone or in combination with green bananas or corn flour for dumplings. They spent more on cooking oil per adult equivalent as well as on seasoning, which seems plausible in light of the above-mentioned higher expenditures per adult consumer equivalent on meat and poultry, since these are the ingredients used in preparing stew, the main "meat" dish. However, averages may be somewhat misleading, since only four of the eleven households of migrants sampled purchased meat.

This suggests only that there may be a better quality of food available per individual in some migrant households than in most non-migrant households. Whether this means a better quality diet per adult consumer equivalent is inconclusive for several reasons. We have no information on the intra-household distribution of food. Adults, that is, those over fifteen may be the major beneficiaries of this higher food quality or males who work more on farms when migrants are away, may benefit more than females. Moreover, more migrant households purchased chicken backs (nine out of eleven or 82 percent) than purchased meat, a better source of protein (four out of eleven or 36 percent). These better quality food purchases may also have gone to feeding hired men, who

usually get good meals. The proportion of food expenditure allocated to hired men was not taken into account in the adult equivalency measure, because this information was not available. Moreover, the male hired labor component of the production unit would change on a daily and weekly basis in most households when male household heads were abroad. Were this the case, however, we would anticipate that migrants' children would not have better nutritional status than non-migrants' children (see anthropometric analysis, below).²

11.2 Methodology/Nutritional Status Appraisal

11.2.1 Characteristics of the Sample Our original sample consisted of 116 children and young adults below eighteen years of age. Of this number, eighty-eight were finally selected for analysis. Twenty eight were excluded because their biological age was greater than eighteen.

² Exchange labor is also "paid" in food but since this is reciprocated by the "partner" we assume the net effect of this transfer on food consumption per adult equivalent is zero. This may also occur when male hired workers simply replace the migrant in work activity and food consumed.

because their households could not be included in the analysis because of insufficient information.

Of these 88 individuals, 29 were four years and eleven months or younger. As we noted above, weights-for-height were analyzed for 68 children under eleven years of age, of which 39 were aged five to eleven. Of these children, thirty-eight were from migrant and thirty from non-migrant households; thirty-five were female and thirty-three were male.

The entire sample of eighty-eight children belonged to thirty-three households, of which from one to six of their children were included in our analysis. Height-for-age analyses were performed on these eighty-eight children, of which 45 were from migrant households and 43 from non-migrant households; 49 were female and 39 were male. Fourteen females were between ten and eighteen and six males were between eleven and eighteen years of age. At the sub-regional level, sixty-eight children and young adults were from the northern and central highlands, and twenty were from upland and lowland coastal zone communities.

Anthropometric measurements are the primary indicator of nutritional status. Although dietary studies can provide the link between food acquisition at the household level and the

diets of individuals, diets in and of themselves do not provide conclusive evidence of changes in nutritional status.

Nutritional status is mediated by a complex interaction of factors which affect the balance between nutrient intake and nutrient requirements of individuals. Host, agent and environmental factors all affect the nutrient requirements of individuals. The host factors are both physiological and pathological. Physical environmental factors would include the greater energy demands and cool climates of mountainous environments. Biological environmental factors are primarily those of infectious disease and the social factors, including the kinds of foods purchased and consumed, as well as sanitation and hygiene which influence the burden of infection. Genetic variation is also a factor, as is the interaction among dietary components that affect nutrient availability. Anthropometric analysis allows us to determine the final result of all these factors.

In comparing two populations that are essentially the same genetically as well as in general health and socio-economic status, as in our sample, we can infer that great differences in anthropometry among young children are very likely due to differences in diet.

Seasonal migration might be expected to bring about both short-term and long-term changes in nutritional status of children. Migrants include men who leave for the first time whose families would only have had the benefit of purchasing more food than non-migrants for about six months, assuming these purchases are not going to workers from outside the household. However, for other households migration would have been the pattern throughout the children's lives.

For children in the study, weights-for-height are a measure of current or recent nutritional status, and are useful in this study which focuses on children in a sample of families of migrants, some of whom have worked abroad for only a short period of time (one year). Migration would have less effect on height-for-age, except among weaning-aged children. The findings of the height-for-age analysis of weaning aged children will be reported in a future publication.

In order to examine the general nutritional level of the two groups, we used heights-for-age of children and adults under eighteen. Weight-for-height and height-for-age are particularly useful in detecting undernutrition during the weaning period from 6 to eighteen months of age. As children grow older, weight-for-height is more likely to reflect

malnutrition during the weaning period than at the time of the measurement. With this qualification, the indicator is still useful for boys under eleven and girls under ten years and six months, because at these ages there are no significant differences in the range of normal anthropometric values of well-nourished children, irrespective of country of origin.

Both the percentiles of weight-for-height and height-for-age were expressed as z-scores for statistical analysis. We used z-score contingency tables to analyze the associations between groups. Z-scores analysis measures the standard deviation from the median.

11.2.2 Analysis of the Results

Non-migrant children might be at greater risk for malnutrition because their families have less disposable income per adult consumer equivalent to purchase higher quality foods as a supplement to their diets. Conversely, we might expect weights-for-height of migrant children to be higher than those of non-migrant children.

As we see in Table 32, the number of individuals per cell are too small to analyze the data both by household migration status and by sex. We are therefore unable to

determine at this stage whether female children of migrant women are given better nutrition than those of non-migrant women when men are away (see below). The dietary analysis in our above-mentioned forthcoming report will enable us to assess this more fully, since it examines the intra-household distribution of food by migration status, age and sex.

11.2.3 Analysis of Nutritional Status By Migration Status

We must reject the hypothesis that non-migrant children will have significantly less weight-for-height than migrant children. There is no significant association between weight-for-height and migration status (chi-square = 1.774; $p = 0.4$).

When we examine height-for-age by migration status we see no significant association (chi-square = 0.8131; $p = 0.7$). There are thus no differences in nutritional status as measured by this criterion. Analyses of patterns with the groups indicates that 26 percent of migrant children and thirty percent of non-migrant children have z-scores less than minus one, a non-significant difference. However, when compared with the normal distribution (15.9%), this means that both groups are disproportionately stunted.

11.2.4 Analysis of Nutritional Status by Sex

We wanted to evaluate whether male children tended to be better nourished than female children. This was of interest because of the observation that males receive preferential nutrition. Our ethnographic analysis did not reveal preferential treatment of male children with regard to basic needs such as primary education and clothing. When we investigated whether there were any discernible sex differences in current nutritional status among children under eleven we found none.³

³ We will examine whether migration caused sex differences in nutritional status in a future publication.

Part Four

Summary Analysis

Seasonal migration leads to significantly higher total farm-household income. This is due to migrants' U.S. earnings, since agricultural revenues are about the same as those of non-migrants and other farmers throughout western St. Thomas Parish, as is their livestock income. When we examine the other components of farm-household income, we find that migrants earn less off-farm income in Jamaica than non-migrants, due to redistributational mechanisms that still exist in their society.

Female heads of migrant household earn about the same in off-farm work as those of non-migrant household. Since regular remittances were sent primarily to female household heads. This gives us further evidence that Jamaican women tend to be economically independent.

Examination of the disposal of income earned in the U.S., shows no important regional expenditure differences among migrants, with the exception of expenditures on food. Landless peasants in coastal regions spent more of their

"migration income" on food than those in other, primarily mountainous, regions who owned land.

Clothing and school fees were financed largely by remittances. This would indicate that children's welfare was a priority for "migrant" women. Income "saved" by men when remittances and living expenses in the U.S. were deducted (including forced savings) was also used for household maintenance. Household maintenance was a priority for men as well. These results support our earlier observation that the economic arrangements between migrants and their households were mutually beneficial.

In addition, migrants spent significantly on food, clothing, and electricity than did non-migrants during that year. In addition to more "lunch money" and clothing for school, children who lived in homes with electric light could study longer and perform better in school. In contrast, non-migrant children were unable to attend school as frequently, because they did not have adequate clothing or enough money to buy food at school.

Non-migrants had only limited means of financing school expenditures. The sale of livestock covers the initial expenditures for books, supplies and some clothing but is

insufficient to pay for education-related expenses throughout the school year. Moreover, farmers are unwilling to sell all their livestock, except in an emergency. Other sources of credit (e.g., loans from commercial banks) are not available to everyone and are undesirable because of the high interest rates (see Chapter 4).

Women and children in migrant households had more leisure time than those in non-migrant households. Female heads of non-migrant households worked significantly more in agricultural and domestic production than those in migrant households. Analysis of labor-time allocation shows that women in migrant households who had more children, worked more hours per week during the season in which men were abroad. This means that these women were able to adjust their work schedule to their children. "Non-migrant" women were unable to do so. On the other hand, men who did not migrate might have helped their spouses with childcare, so that non-migrant women may not have needed to adjust their work schedules. However, based on our interviews and the other results of the study, the former seems more plausible.

Migrant households spent more income on foods high in calories, sodium and fat, while migrants were away. The variety of purchased foods improved only slightly, in that

"migrant" women purchased more fish. Since migrant children did not have better nutritional status than those of non-migrants, we see that seasonal male migration did not improve children's nutritional status. The children tended to be stunted, but were not undernourished. Those with lower heights-for-age had obviously been malnourished in the past, however, this was unrelated to migration.

Welfare benefits, in this instance, were measured by migrants in their own terms. They had more food, and according to local criteria, they were better off. In nutritional terms, however, the food they purchased may not have been better. It may have led to hypertension, for example. On the other hand, it was demonstrated that cornmeal can provide eleven times more kilocalories per J.\$ in 1984 and the trend since then indicates that the nutrient cost of yams was becoming more expensive relative to cornmeal.¹

¹ Caribbean Food and Nutrition Institute, Background paper for Workshop on Household Food Availability and Nutritional Status: The Challenge for the Future, 10 -11th October 1984, University of the West Indies. Cited in D.A.C. Boyd, Economic Management, Income Distribution and Poverty in Jamaica, Praeger, 1988.

Macro-economic Factors

Not only the internal social characteristics of the household, but also the external, structural changes which were taking place in the economy shaped small farmers' perceptions and decision-making. Structural adjustment policies which deregulated the prices of domestic and imported commodities, caused the above-mentioned rise in the price of yams versus subsidized imported cornmeal (a PL-480 commodity). Between 1984 and 1986 the price of the minimum food basket rose 44.9 percent, for an average Jamaican household of five individuals, composed of two adults and three children.² This was even higher in rural areas due to the added cost of transportation. This suggests that migrants were able to continue to afford foods which non-migrants could not afford; and that, to a certain extent, migrants simply maintained previous levels and patterns of food consumption which non-migrant were unable to.

Besides these recent trends in the Jamaican food economy, there were larger macro-economic trends that had been in existence, which affected farm-household decision-making.

² In D.A.C. Boyd, Ibid.

Economic conditions in Jamaica had been declining over the past thirty years. In 1958, the lowest 20 percent of Jamaicans had a 2.2 percent share of household income and the highest 20 percent, a 61.5 percent share of household income. Less than twenty years later, in 1972, this had changed to 2.0 percent for the lowest and 64 percent for the highest income groups. This worsening trend was even more evident in rural areas. In the early 1970s, 46.3 of urban households fell within the two lowest income classes, whereas in rural areas 69.7 percent of households fell within that category.³

Under recent stabilization policies, the Jamaican government has had to reduce expenditures on "basic needs" such as housing and education. According to Boyd, capital expenditure on housing in the budget of 1985-1986 was only 11 percent of the 1982-1983 real level. This precipitated a decline in the construction industry. At the same time, a decline in the supply of new low-income homes and, of even greater importance to rural areas, a rapid increase between 1981 and 1985 of 115 percent in rural housing prices. This was even higher than the rate of increase in Kingston, where housing rose by 95 percent over the same period.

³ D.A.C. Boyd, Economic Management, Income Distribution and Poverty In Jamaica, Praeger, 1988, p. 81.

Government expenditure on public education for the 0-14 age group fell 40 percent from 1982 to 1986, from J.\$361 to J.\$218 per person. With the population of this small nation increasing at a rate of 1.5 percent per year, cutbacks, resulting in a high attrition rate among secondary school teachers, competition increased among children for places in secondary schools.⁴ Even though inflation was being brought under control by structural adjustment and stabilization, small farmers' perception of the state of the economy had not changed, especially since they were directly affected by the reductions in social expenditures and in agricultural extension (see Chapter 3). Not only did reductions in expenditures on agricultural extension deter small farmers from investing in agriculture, but it also severely diminished small farmers' access to export markets such as the export varieties of bananas. Jamaica's failure to meet its EEC (European Economic Community) quota of sugar and especially bananas, caused the EEC to lower its quota for Jamaican agricultural products. The overall decline in the economy was reflected in the unemployment rate, which was 22.3 percent in 1986.

⁴ Ibid., pp. 117-141.

The unemployment rate figures and the rising crime and violence under the young and unemployed, was an added factor in peasant farmers' decisions to educate their children. In 1986, secondary school teachers earned between \$J.\$10,000 and J.\$12,000 annually, about 150% as much as the average yearly revenues from agriculture. School teachers and others with professional backgrounds who were dissatisfied were able to emigrate to the United States. Between 1987 and 1988, the greatest emigration from Jamaica took place, with 37,000 and 38,000 Jamaicans respectively leaving the country, breaking down the institutions of Jamaica.

Comparative Research

When we examine research that has been done on Jamaican migrant farm workers, we find a completely different interpretation of their "consumption-orientation." In his research on Central Jamaica, David Griffith also found that Jamaicans who work as seasonal migrant farm workers did not increase their agricultural productivity but used their income for consumption expenditures, such as housing and education. These expenditures were interpreted by Griffith as not being productive, based on the fact that housing did not improve access to indoor plumbing and other amenities and

education of children did not improve their employment prospects.⁵

⁵ When he compared the number of children in school, he found no significant differences between migrants and non-migrants. However, Griffith does not report the number of days the children attended school or the differences in educational attainment of children. Based on an analysis of national statistics which show the same high unemployment rates of primary and secondary school leavers, Griffith draws the conclusion that even if migrants had more children with secondary school education, their children would still suffer the same unemployment rates as those of non-migrants. He does not, however, report the specific occupational status for the entire population of the adult children of the migrants he studied. See D. Griffith, "Women, Remittances and Reproduction," *op. cit.*

As we have seen, housing does serve a purpose beyond consumption, since it is also used for storage. When harvests are large, up to half of the home may be used for storage.

Our data on consumption patterns is supported by Barbara Miller,⁶ who analyzed the expenditure patterns of joint male-female headed households and female-headed households and found no differences between them. Our own findings of single male-headed and joint male-female headed households show no difference in priorities with respect to the maintenance of the household. We believe this is evidence that Jamaican men do not discriminate against their children and that childrens' "basic needs" priorities are of equal importance to them."

One of the reasons we find this "consumption-orientation" which is geared to increasing welfare is the small size of the holdings. As we demonstrated above, small farmers who were virtually landless used more of their remittances on food consumption than those who had some land. Oberai and Singh⁷ found that farm-households with larger holdings in the Punjab invest them in agriculture

⁶ B.D. Miller, "Gender and Low-Income Household Expenditures in Jamaica," op. cit.

⁷ Oberai, A.S. and and A.K. Manohan Singh. 1980. "Migration, Remittances and Rural Development: Findings of a Case Study in the Indian Punjab." International Labor Review, Vol. 5, p. 119.

(fertilizers, HYV of seed, etc.), while smaller holdings spent remittances on consumption as well as on debt repayment.

Chapter 12

CONCLUSION

12.1 The Effect of Migration on Farm Production

Seasonal Jamaican male migration does not lead to a decline in agriculture. Importantly, it does not lead to a decline in food crops. Instead, agricultural productivity is maintained, as are mean agricultural revenues. Income from livestock is also maintained. By at least maintaining annual farm income at the same level as non-migrants, migrants are able to increase their total incomes by working abroad.

12.2 Economic Behavior of Migrant Households

An important social factor in determining whether men will leave their farms is the number of adult males in the household. These tend to be sons in their late teens or older, and other adult male relatives whom migrants incorporate into their households over time. Migrants also tend to hold more cattle when they have other adult males in the household.

The main actor involved in migrants' decision-making, however, is the female head of household. They tend to be the spouses of migrants who are in charge of the farm-household

in their absence. Jamaican women play a critical role in generating farm-household income, since they are responsible for marketing most of the crops. Moreover, women's agricultural tasks, such as weeding, and their responsibilities of preparing meals and supervising male hired workers, requires that migrants have a mutual understanding with their spouses regarding the management of the farm in their absence. The importance of women's roles is illustrated by cases in which men were either single or did not have adequate arrangements with their spouses. This would lead to a decline in farm output or would entail a series of complicated arrangements with male relatives and friends, or with their children. Such labor arrangements with school-aged children requires them to leave school. This is highly undesirable, since the need to finance the education of children is one of the reasons men do seasonal farm work abroad.

We now begin to understand the logic of temporary male labor migration. Higher incomes earned by migrants are mainly used for consumption. However, this is allocated for what they consider to be productive uses. Migrant households spend their additional income on food, clothing, shelter and electricity. They also spend it on leisure time, some of which is used to educate children. This additional income

allows migrants to respond or adjust their output of important food crops, and lets women adjust their farm and domestic labor time, to the number of children they have in the household. Other adult males in the household help children indirectly by tending cattle, which is sold later on to pay their initial education expenses. This overall "responsiveness" to the social characteristics of migrants' particular households, especially the ability of the migrant household to organize itself around children is an added benefit for children. Migration therefore clearly allows an investment in human capital.

Men as well as women in migrant households establish, at least, an implicit understanding with each other, and with their children. This mutual understanding is based on a long-term planning process involving inter-generational transfers between parents and their children. The migrant works under difficult conditions abroad to ensure the welfare of his family, while women and children look after his investment in the farm. Adult children of migrants tend to get better occupations, which allow them to provide social security for their elderly parents.

The immediate benefits to adults are more subtle, but should not be underestimated. Better housing gives them

better storage facilities for crops and cuts down on time spent in harvesting. It also gives them more social status in their community. Certain, less desirable land tenure or labor arrangements can be altered. These "part-time peasants" can buy land and hire labor, which gives them more control over the production process. This does not necessarily reflect a change in their value system, however, since in the post-war era small farmers have for example, used more hired labor than other forms of extra-household labor.

Quite apart from these benefits, there are also significant costs to the household. Women worry over their husbands' health while they are abroad. Migrants resent the often demeaning working conditions and treatment they receive, and the low pay relative to U.S. workers. In fact, their low wages are often justified by their employers based on the advantages migrants are able to provide for their families. There was a high risk of losing these migrant farm work jobs if corrupt officials in Jamaica gave migrant farm work "cards" to other men; if the men complained about working conditions while in Florida; if they hurt themselves while cutting cane or if they became ill. Recently, men in the Belle Glade area have been exposed to a population with among the highest rates of AIDS infection in the United States, and four men were reportedly diagnosed with AIDS in

1986. However, when they consider the limited options available to them in Jamaica in order to achieve their goals, the benefits are obvious to them.

12.3 International Labor Migration and The "Welfare Contract"

We conclude that from the perspective of men and women who are small farmers in Jamaica, seasonal migration of men to the United States allows them to counteract, or even overcome the economic conditions that detrimentally affect their basic needs and thus their ability to make socio-economic progress through their children.

As long as domestic agricultural and other economic policies discourage small-scale farming and discriminate against women, men will not invest significantly more in agriculture, nor will women be able to fully take advantage of their considerable skill as traders. Furthermore, the reductions in social expenditures, the perception of these men and women of the high unemployment rates in Jamaica and knowledge that adults with better educational backgrounds have a better chance of getting jobs abroad as well as at home, focuses their attention on a strategy which would increase the returns to their children and to themselves.

The "welfare contract" represents a short-term social strategy and longer term economic strategy of the Jamaican peasant household. Thus, food is not necessarily used as a means of improving nutrition; a goal we would wish to encourage. It is used as a means of furthering education. In so far as this benefits female children as well as males, it also becomes a means for Jamaican women to improve their socio-economic status.

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APPENDIX A

Table 1. Demography

	Total (n=1)	Migrant (n=34)	Non-migrant (n=28)
sample size	357	194	163
under five (male & female)	48	25	23
total males	178	102	76
males under 15	74	45	29
males 15-29	47	26	21
males 30-49	33	22	11
males 50-69	16	6	10
males 70 and older	8	3	5
total females	179	92	87
females under 15	75	38	37
females 15-29	55	29	26
females 30-49	28	13	15
females 50-69	15	8	7
females 70 and older	6	4	2
pregnancies (female heads)	11	6	5
pregnancies (total)	19	10	9
births **	19	10	9
-male	7	2	5
-female	12	8	4
mortality **	5	1	4
-male	4	1	3
-female	1	0	1
in-migration ***	11	11	0
-males	5	5	0
-females	6	6	0
out-migration ***	11	10	1
-males	4	3	1
-females	7	7	0

* Absolute frequencies, as of February 1, 1987, including male migrants.

** fertility rate 53 per 1000; mortality rate 14 per 1000

*** in-migration (i.e., into household) or out-migration (i.e., out of household) of individuals other than the male migrant head of household.

Table 2. Comparison of Mean Fecundity,
Fertility and Mortality per Household

	Migrant	Non-migrant
fecundity	0.29	0.32
fertility	0.29	0.32
fecundity, female head	0.18	0.18
fertility, female head	0.18	0.18
male births	0.06	0.18
female births	0.24	0.14
male deaths *	0.03	0.03
female deaths *	0	0.04

* All deaths among individuals over 67 years,
except one 28-year-old male (in non-migrant
household).

Table 3. Mean Household Size and Composition.

	Migrant	Non-migrant	
size	5.7	5.7	
under five (male & female)	0.74	0.82	
males	3.0	2.6	
mean age male head	38.5	42.8	
males under 15	1.32	1.04	
males 15-29	0.76	0.71	
males 30-49	0.65	0.39	(p=0.0475)
males 50-69	0.18	0.36	(p=0.1180)
males 70 and older	0.06	0.11	
females	2.7	3.1	
mean age female head	39.0	41.0	
females under 15	1.12	1.32	
females 15-29	0.85	0.93	
females 30-49	0.38	0.54	
females 50-69	0.24	0.25	
females 70 and older	0.12	0.04	

 * p-value only indicated where alpha or = 0.1

Table 4. Productive Capacity of Household *

	Migrant (mean)	Non-migrant (mean)	(D)
household members in production unit	2.65	2.96	0.34
female productive household members	1.32	1.46	0.49
male productive household members	1.41	1.64	0.30
decline female productive household members (1)	0.06	0.04	0.67
decline male productive household members (1)	0.12	0.11	0.89
increase female productive household members (2)	0.15	0.04	0.14
increase male productive household members (2)	0.03	0.04	0.89
adult equivalents **	4.44	4.78	0.56
under-five dependency ratio ***	27.94	31.61	0.67

* expressed in mean absolute frequencies

** 1 = 15 years and older, 1/2 = under-15

*** household members under five years to total number of productive household members.

(1) decline: decrease in number by moving out of farm-household residence(s) or through the death of a household member.

(2) increase in number when individuals move into farm-household residence(s).

Table 5. Migration History

	Total		Mean	
	Migrant	Non-migrant	Migrant	Non-migrant
migration status in 1986-87	34	28	n.a.	n.a.
migration status in 1985-86	29	33	n.a.	n.a.
total yrs. farm work	195	58	5.7	2.07 ($\alpha_1=0.0049$)
other travel male head (no. of times)	1	1 ***	0.03	0.08
travel female head (no. of times)	1	2	0.07	0.03
total travel (no. of times)	197	61	5.77	2.15 ($\alpha_1=0.0055$)
percent relatives within district	n.a.	n.a.	74.0	66.0
percent relatives in Jamaica	n.a.	n.a.	13.0	14.0
percent relatives in No. America and/or U.k.	n.a.	n.a.	12.1	20.0 ($\alpha_2=0.14$)
percent relatives in Caribbean	n.a.	n.a.	0.4	0

= number of times migrant farm work in the U.S.

** $\alpha_1 = 0.1$, whereas $\alpha_2 = 0.15$, since migration information on close relatives is less reliable

*** A current non-migrant travelled to England once, where he lived for four years. Otherwise, migration was for a duration of less than one year.

Table 6. Land Size and Value, By Tenure Status

Total acreage entire sample (n=62): 427.2 acres

A. (with outliers) *

Land Tenure	Total Land Size (acres)		Mean Land Size (acres)			Mean Value per Farm (J.₹)			(1)
	Migrant (n=34)	Non-migrant (n=28)	Migrant (n=34)	Non-migrant (n=28)	(p)	Migrant (n=34)	Non-migrant (n=28)	(p)	
owned	167.9	180.2	3.94	5.19	0.36	17.341	22.781	0.36	
leased (2)	31.3	16.5	0.92	0.59	0.34	4.044	2.589	0.34	
rented (2)	15.0	9.3	0.44	0.33	0.65	1.908	1.459	0.65	
occupied	4.0	0	0.12	0	0.17	517	0	0.17	
tot. farm size (3)	218.2	209	5.42	6.11	0.61	23.802	26.829	0.61	

B. (without outliers)

Land Tenure	Total Land Size (acres)		Mean Land Size (acres)			Mean Value per Farm (J.₹)		
	Migrant (n=34)	Non-migrant (n=28)	Migrant (n=34)	Non-migrant (n=28)	(p)	Migrant (n=34)	Non-migrant (n=28)	(p)
owned	167.9	100.2	3.94	4.20	0.8	17.341	18.450	0.80
leased (2)	31.3	16.5	0.92	0.63	0.42	4.044	2.788	0.42
rented (2)	15.0	9.3	0.44	0.36	0.74	1.908	1.571	0.74
occupied	4.0	0	0.12	0	0.17	517	0	0.17
total farm size (3)	218.2	126	5.42	5.19	0.62	23.802	22.810	0.85

(1) At 1987 prices

(2) prices assessed at full land value.

however, average rental cost is \$21 per year

(3) including all forms of tenure

conversion: J.₹5.50 = U.S. \$1.00

* two outliers in non-migrant group

Table 7. Land Purchasing Patterns

By 1986-87 migration status

A. (with outliers)

	Land Purchased in 1986-87		Land Purchased in 1985-86		Land Purchased pre-1985			
	Total Acreage	Total Cost (J.\$)	Total Acreage	Total Cost (J.\$)	Total Acreage			
migrant in '86-'87	2.0	11,300	0.6	4,500	21.7			
non-migrant in '86-'87	0.8	1,000	0.8	4,000	72.1			
	Mean Acreage	Mean Cost	p	Mean Acreage	Mean Cost	p	Mean Acreage	p
migrant in '86-'87	0.59	332	0.18	0.18	132	0.95	3.44	0.34
non-migrant in '86-'87	0.29	36		0.29	143		7.89	

B. (without outliers) *

	Land Purchased in 1986-87		Land Purchased in 1985-86		Land Purchased pre-1985			
	Total Acreage	Total Cost (J.\$)	Total Acreage	Total Cost (J.\$)	Total Acreage			
migrant in '86-'87	2.0	11,300	0.6	4,500	11.7			
non-migrant in '86-'87	0.8	1,000	0.8	4,000	9.6			
	Mean Acreage	Mean Cost	p	Mean Acreage	Mean Cost	p	Mean Acreage	p
migrant in '86-'87	0.59	332	0.20	0.17	132	0.91	3.44	0.94
non-migrant in '86-'87	0.31	38		0.31	154		3.69	

J.\$5.50=U.S.\$1.00

non-migrant sample size (n) = 26

Table 8.a. Total and Mean Value of Gross Output, per Crop
and per Household

Crops -----	Migrant ----- Value (J.\$) -----		Non-migrant ----- Value (J.\$) -----		(p)
	Total (n = 34)	Sample Mean	Total (n = 28)	Sample Mean	
coffee	1.591	47	2.075	74	0.46
cocoa	674	20	2.291	82	0.15
pimento	20.688	608	13.720	490	0.61
carrot	82.969	2.440	46.564	1.663	0.27
tomato	1.896	56	1.720	61	0.84
pumpkin	5.316	156	11.649	416	0.11
scallion	6.273	184	731	26	0.41
thyme	1.720	51	1.795	64	0.81
gungo pea	49.396	1.453	71.089	2.539	0.16
broad bean	10.144	298	6.520	233	0.67
red pea	20.803	612	176	6	0.02
renta yam	106.656	3.137	89.280	3.189	0.95
st. vincent yam	4.741	139	3.961	141	0.96
banana	192.216	5.653	157.248	5.616	0.98
plantain	44.763	1.317	46.736	1.669	0.50
sweet potato	10.757	316	4.588	164	0.17
breadfruit	3.523	104	3.757	134	0.64
cho-cho	755	22	310	11	0.86
ackee	4.428	130	6.054	216	0.29
other crops	158.678	4.667	190.232	6.794	0.14
-----	-----	-----	-----	-----	-----
total	727.987	21.411	660.520	23.590	0.58

Table 8.b. Value of Output
among Households Producing
these Crops

Crops	Migrant		Non-migrant		(p)
	Value (J.\$)	n (no. subsample)	Value (J.\$)	n (no. subsample)	
coffee	122	13	160	13	0.63
cocoa	35	19	127	18	0.19
pimento	940	22	762	18	0.58
carrot	3.457	24	2.739	17	0.43
tomato	86	22	101	17	0.73
pumpkin	204	26	529	22	0.11
scallion	1.568	4	183	4	0.37
thyme	430	4	358	5	0.85
gungo pea	1.703	29	2.539	28	0.31
broad bean	597	17	724	9	0.70
red pea	1.600	13	59	3	0.20
renta yam	3.441	31	3.307	27	0.89
st. vincent yam	178	27	180	22	0.93
banana	6.201	31	6.048	26	0.94
plantain	1.599	28	2.226	21	0.31
sweet potato	414	26	353	13	0.75
breadfruit	136	26	179	21	0.81
cho-cho	246	18	404	15	0.23
ackee	4.667	34	6.795	28	0.14
other crops					

* size of subsample

(sample size of migrants = 34)

(sample size of non-migrants = 28)

Table 8.c. Total and Mean Volume, per Crop
and Mean per Unit Prices

Crops	Volume *		Volume *		Price (J.\$) ***
	Total	Mean	Total	Mean	Mean/unit
coffee	3.88 bu.	0.11 bu.	8.94 bu.	0.18 bu.	411.00
cocoa	13.38 bx.	0.39 bx.	45 bx.	1.6 bx.	50.40
pimento	5.172	152	3.444	123	4.00
carrot	65.330	1.921	36.611	1.308	1.27
tomato	9.482	28	8.599	31	2.00
pumpkin	5.316	158	11.326	405	1.50
scallion	1.442	42	168	6	4.35
thyme	344	10	359	13	5.00
gungo pea	15.545	457	22.285	796	3.19
broad bean	3.102	91	1.994	71	5.00
red pea	4.144	122	35	1 **	5.02
renta yam	53.328	1.568	44.640	1.594	2.00
st. vincent yam	6.585	193	5.501	196	0.72
banana	8009 st.	236 st.	6552 st.	234 st.	24.00
plantain	90.256	2.743	97.367	3.477	0.48
sweet potato	10.757	316	4.588	164	1.00
breadfruit	2.774	82	2.958	106	1.27
cho-cho	1.641	48	673	24	0.46
ackee	369	11	526	19	12.00
other crops	n.a.	n.a.	n.a.	n.a.	n.a.

* In lbs., unless otherwise indicated (bu. is bushel; bx. stands for box; st. stands for stem). See Table 9 for conversions.

** The amount of red peas grown in the non-migrant sample was negligible (see below).

*** This is the mean of the farmgate prices used by farmers. The actual farmgate prices were used in calculating the values of output reported above. Instead of the mean farmgate prices shown here.

Table 8.d. Mean Square Output

Crops	Output. mean square	F **	p **
coffee	11448	0.55	0.46
cocoa	58939	2.11	0.15
pimento	215509	0.26	0.61
carrot	9276694	1.21	0.27
tomato	489	0.04	0.84
pumpkin	1435313	2.54	0.11
scallion	388219	0.68	0.41
thyme	2806	0.05	0.81
gungo pea	18112152	1.97	0.16
broad bean	65813	0.18	0.67
red pea	5630932	5.15	0.11
renta yam	40931	0	0.95
st. vincent yam	62	0	0.96
banana	21491	0	0.98
plantain	1908945	0.44	0.5
sweet potato	14314	0.21	0.64
breadfruit	357214	1.88	0.17
cho-cho	1907	2.13	0.14
ackee	113509	1.13	0.29
other crops	69530272	2.15	0.14

* Type I sum of squares

** significance $-2(F < 2$

(alpha = 0.1)

Table 9. Conversions

1 bushel coffee = 64 lbs. (approx. 1 box of coffee)

1 box wet cocoa = 56 lbs.

1 stem of bananas = 27.5 lbs.

Table 10. Value of Agricultural Output, Sales and Consumption
per Farm-household *
August 1986 - July 1987

	Total Value of Output (J.\$)		Sales (J.\$)		Consumption (J.\$)	
	Migrant	Non-migrant	Migrant	Non-migrant	Migrant	Non-migrant
Crops	727.987	660.520	336.074	335.397	389.910	325.128
Livestock	16.830	20.496	17.283	10.044	0 **	0 **

	Mean Value of Output (J.\$)			Mean Sales (J.\$)		Mean Consumption (J.\$)			
	Migrant	Non-migrant	p ***	Migrant	Non-migrant	p	Migrant	Non-migrant	p
Crops	21.411	23.590	0.58	9.943	11.978	0.47	11.468	11.612	0.96
Livestock (1)	495	732	0.69	508	359	0.57	0 **	0 **	n.a.

- * Unit of analysis for all tables, unless otherwise noted
 ** home consumption of livestock is negligible (occasionally small stock or products such as eggs or milk (see below)
 *** p-value: probability that means are not significantly different at a significance level $> \alpha$ ($\alpha = 0.1$).
 (1) total mean value of output = total mean stock value end of year minus total mean stock value beginning of year plus sales

Table 11. Land and Labor Input
Selected Crops

	Land Size		Standard Labor Input	
	Migrant (mean acreage)	Non-migrant	Migrant (mean personhrs./acre) *	Non-migrant
coffee	0.432	0.734	432	432
carrots	1.087	0.923	482	482
gungo peas	0.451	0.707	501	501

** There was little difference among farms in the amount of labor used per acre.

Table 12. Gross Output, Sales and Home Consumption
of Major Crops, by Migration Status

Crop *	Value (J.\$)			Sales (J.\$)			Home Consumption (J.\$) **		
	Migrant	Non-migrant		Migrant	Non-migrant		Migrant	Non-migrant	
	(mean)	(mean)	(p)	(mean)	(mean)	(p)	(mean)	(mean)	(p)
coffee	47	74	0.46	47	74	0.46	0	0	n.a.
cocoa	20	82	0.15	20	82	0.15	0	0	n.a.
pimento	608	490	0.61	608	490	0.61	0	0	n.a.
carrot	2440	1663	0.27	2440	1663	0.27	0	0	n.a.
tomato	56	61	0.84	56	61	0.84	0	0	n.a.
pumpkin	156	416	0.11	156	416	0.11	0	0	n.a.
scallion	184	26	0.41	184	26	0.41	0	0	n.a.
thyme	51	64	0.81	51	64	0.81	0	0	n.a.
gungo pea	1453	2539	0.16	189	330	0.16	1264	2209	0.16
broad bean	298	233	0.67	298	233	0.67	0	0	n.a.
red pea	612	6	0.02	612	6	0.02	0	0	n.a.
renta yam	3137	3189	0.95	797	623	0.75	2340	2566	0.77
st. vincent yam	139	141	0.96	25	33	0.70	115	109	0.88
banana	5653	5616	0.98	1371	1937	0.41	4282	3679	0.75
plantain	1317	1669	0.50	670	1140	0.29	647	529	0.66
sweet potato	316	164	0.17	90	25	0.06	226	139	0.41
breadfruit	104	134	0.64	14	40	0.12	90	94	0.93

* ackee and chocho were not included
because their home consumption could
not be accurately estimated.

Table 13. Total Farm-household Income

(in J.\$)

	Migrant		Non-migrant		(p)	
	(mean)		(mean)			
	Gross	Net	Gross	Net	Gross	Net
a. Farm (tot.)						
Crops (consumption and sales)	21.906	19.705	24.322	22.356	0.56	0.41
Livestock (change in stock plus sales)	495	157	702	673	0.69	0.38
b. Off-farm (tot.) *	2.557	n.a.	4.667	n.a.	0.14	n.a.
Maies	382	n.a.	3.609	n.a.	0	n.a.
Females	1.675	n.a.	1.068	n.a.	0.48	n.a.
c. Migration	22.576	17.457 **	n.a.	n.a.	n.a.	n.a.
d. Tot. Income (sum of above)***	47.040	39.720	28.999	22.356	0	0
e. Women's off-farm income as % tot. farm income *		66.91%		27.57%		
f. Men's off-farm income as % gross income *		1.67%		12.98%		
g. Women's off-farm income as % gross income *		4.20%		3.08%		

* off-farm non-migration income

** deducting 23% of income withheld for cost of living
and compulsory savings

*** as measured by change in output value and cash receipts

Table 14. Gross Output, Sales and Home Consumption
By Region

Crop	Region 1 (mean score) * (n = 62)			Region 2 (mean score) * (n = 62)			Region 3 (mean score) * (n = 62)		
	Total	Sales	Consumption	Total	Sales	Consumption	Total	Sales	Consumption
coffee	36	36	0	32	32	0	43	43	0
carrot	40	40	0	44	44	0	25	25	0
gungo pea	48	48	48	30	30	30	23	23	23
red pea	39	39	0	30	30	30	23	23	0
renta yam	34	29	36	36	32	38	25	32	23
st. vincent yam	38	32	37	35	33	38	28	31	27
banana	28	22	35	32	32	31	39	37	36
plantain	17	23	17	33	33	33	28	24	33
sweet potato	44	34	43	31	30	32	29	31	29
pumpkin	33	33	0	36	36	0	35	35	0
broad bean	31	31	0	36	36	0	25	25	0
tomato	33	33	0	36	36	0	36	36	0
pimento	38	38	0	41	41	0	33	33	0
breadfruit	37	33	35	33	30	34	27	35	26
cocoa	38	38	0	40	40	0	33	33	0
scallion	33	33	0	37	37	0	31	31	0
thyme	35	35	0	42	42	0	27	27	0

Crop	Region 4 (mean score) * (n = 62)			Region 5 (mean score) * (n = 62)			Region 6 (mean score) * (n = 62)		
	Total	Sales	Consumption	Total	Sales	Consumption	Total	Sales	Consumption
coffee	19	19	0	24	24	0	19	19	0
carrot	27	27	0	45	45	0	12	12	0
gungo pea	27	27	27	31	31	31	33	33	33
red pea	24	24	0	47	47	0	24	24	0
renta yam	34	33	36	27	39	20	34	30	33
st. vincent yam	32	29	36	37	35	33	21	30	21
banana	30	32	34	24	26	23	25	34	21
plantain	42	45	40	30	25	31	44	44	36
sweet potato	28	30	30	24	32	21	28	32	26
pumpkin	31	31	0	14	14	0	24	24	0
broad bean	29	29	0	37	37	0	38	38	0
tomato	25	25	0	35	35	0	19	19	0
pimento	14	14	0	41	41	0	20	20	0
breadfruit	32	24	40	37	39	22	27	30	31
cocoa	26	26	0	23	23	0	40	40	0
scallion	28	28	0	28	28	0	28	28	0
thyme	27	27	0	27	27	0	27	27	0

Table 14. Gross Output, Sales and Home Consumption
By Region (continued)

Crop	p		
	Value	Sales	Consumption
coffee	0	0	n.a.
carrot	0	0	n.a.
gungo pea	0.02	0.02	0.02
red pea	0	0	n.a.
renta yam	0.49	0.92	0.15
st. vincent yam	0.25	0.95	0.17
banana	0.33	0.37	0.41
plantain	0.01	0	0.08
sweet potato	0.20	0.97	0.22
pumpkin	0.22	0.22	n.a.
broad bean	0.25	0.25	n.a.
tomato	0.18	0.18	n.a.
pimento	0	0	n.a.
breadfruit	0.65	0.58	0.36
cocoa	0.06	0.06	n.a.
scallion	0.20	0.20	n.a.
thyme	0	0	n.a.

* Kruskal-Wallis test: every value is assigned a rank number, starting from the lowest value (score = 1); the higher the mean score the higher the value; alpha = 0.1
We can only determine that a significant difference between regions exists; this test cannot be used to determine between which regions.

** Region 1: northernmost region (including mist forest): Cedar Valley, Content, Bethel Gap, Mango Row, Ness Castle and Woburn Lawn.
Region 2: Central highlands with a high degree of land leasing at lower altitudes and a drier climate, with districts/communities: Mt. Lebanon and Somerset.
Region 3: Densely forested central highlands west of Negro River, immediately north of Region 2: Trinityville (with Moffatt), Jones Pen, Holiday Hill, Wakefield, Mt. Vernon, Mt. Vernon Gap, Albion Mountain and Richmond (or Wilson) Gap.
Region 4: Hot, arid plains, with low-lying hills and sparse vegetation with mostly landless farmers: Coley, Georgia and Bailey's Piece.
Region 5: Steep hills overlooking the coast, individual land ownership: Font Hill, Davis Mountain.
Region 6: Coastal Plains with alluvial and sandy soils with mostly landless farmers in the town and the large estate zone: Seaforth and Danvers Pen.

Table 15. Provisioning of Staples
Percent Produced for the Market

Crop	Migrant		Non-migrant		p
	n (subsample)	mean %	n (subsample)	mean %	
renta yam	31	16	27	17	0.89
st. vincent yam	27	13	22	13	0.98
banana	31	31	26	37	0.46
plantain	28	42	21	42	0.96
coco yam	34	44	28	26	0.05
sweet potato	26	25	13	18	0.54
breadfruit	26	12	21	38	0
irish potato	2	6	0	0	0.15
cassava	34	5	28	28	0.44
other yams	34	4	28	28	0.23
corn	2	1	25	25	0.03

* means of the subsample of farms
which cultivated these crops

Table 16. Labor Utilization and Cost
Selected Cash Crops

Table 16. Labor Utilization and Cost
Selected Cash Crops

	Migrant	Non-migrant	p
Labor Units (personhrs.) *			

coffee	187	317	0.24
carrot	524	445	0.65
gungo pea	226	354	0.12
Labor Cost (J.\$) **			

coffee	63	366	0.05
carrot	439	347	0.64
gungo pea	142	170	0.70

* Hired and/or exchange labor plus household labor,
expressed in mean no. of personhrs.

** Cost of hired and exchange labor

Table 17. Crop Input Expenditures
(Non-Labor Inputs)

(in J.\$)

	Migrant (mean)	Non-migrant (with outliers) (mean)	(p)	Migrant (mean)	Non-migrant (with outliers) (mean)	(p)
seed & plants	474	386	0.47	474	379	0.45
fertilizer	92	81	0.82	92	83	0.86
pesticide	0	12	0.32	0	13	0.31
herbicide	0	45	0.22	0	48	0.22
tools	96	106	0.70	96	110	0.61
total	661	629	0.85	661	633	0.87
						0.45

Table 17. Crop Input Expenditures
(Non-Labor Inputs)

(in J.\$)

	Migrant (mean)	Non-migrant (with outliers) (mean)	(p)	Migrant (mean)	Non-migrant (with outliers) (mean)	(p)
seed & plants	474	386	0.47	474	379	0.45
fertilizer	92	81	0.82	92	83	0.86
pesticide	0	12	0.32	0	13	0.31
herbicide	0	45	0.22	0	48	0.22
tools	96	106	0.70	96	110	0.61
total	661	629	0.85	661	633	0.87

Table 18. Acreage of Major Crops

	Total Acreage		Mean Acreage		p
	Migrant	Non-migrant	Migrant	Non-migrant	
coffee	14.70	20.55	0.43	0.73	0.24
carrot	36.95	25.85	1.09	0.92	0.65
banana	40.00	27.20	1.18	1.33	0.57
plantain	28.90	29.35	0.85	1.05	0.42
major yams *	40.60	30.60	1.19	1.09	0.79
gungo pea	15.35	19.80	0.45	0.71	0.12
red pea	4.50	0.15	0.13	0.01	0

* renta and st. vincent varieties

Table 19. Composition and Utilization of
Extra-Household Labor

Extra-Household Labor -----	Migrant (mean)	Non-migrant (mean)	(p)
tot. labor cost (hired & exchange)	\$ 2038	\$ 1160	0.04
hired labor cost *	\$ 1286	\$ 551	0.02
male hired labor cost	\$ 738	\$ 325	0.06
female hired labor cost	\$ 78	\$ 24	0.21
male exchange labor cost	\$ 242	\$ 289	0.68
female exchange labor cost	\$ 38	\$ 18	0.45
hired labor cost for "other" crops	\$ 470	\$ 201	0.07
exchange labor cost for "other" crops	\$ 471	\$ 302	0.43
tot. hired labor cost as % tot. labor cost	67.75%	51.24%	0.12
male hired labor cost as % tot. labor cost	36.07%	27.23%	0.31
female hired labor as % tot. labor cost	5.77%	4.46%	0.72
hired labor for "pther" crops as % total hired labor cost	36.77%	36.91%	0.98
male exchange labor cost as % tot. labor cost	12.83%	22.13%	0.13
female exchange labor cost as % tot. exchange labor cost	3.48%	2.53%	0.72
ratio of cost of female hired labor to cost of female exchange labor	15.71%	3.71%	0.16
male head's relatives in production unit **	0	0	n.a.
female head's relatives in production unit **	0.65	0.50	0.53
agency" relations ***	0.29	0.11	0.07

* male & female hired labor for major and "other" (minor) crops

** mean absolute frequencies

*** mean frequency with which a male or female household
heads is engaged in an informal contractual arrangement
with a junior male (agent) who works for him/her.

Table 20. Changes in Cultivation
 Cropping Shifts Over August 1986 - October 1987 *

	Migrant		(p)	Net Shift		(p)
	(mean %) (n=34)	Non-migrant (mean %) (n=28)		(mean %) (n=34)	Non-migrant (mean %) (n=28)	
Coffee						
- reduction	0	0	n.a.	4.56	17.86	0.07
- increase	4.56	17.86	0.07			
Carrots						
- reduction	11.18	14.54	0.65	8.97	-3.54	0.41
- increase	20.15	11.00	0.45			
Gungo Peas						
- reduction	16.47	11.07	0.49	-3.47	13.75	0.3
- increase	13.00	24.82	0.36			
Red Peas						
- reduction	5.15	3.57	0.76	0.74	-3.57	0.54
- increase	5.88	0	0.16			
Tomatoes						
- reduction	0	3.57	0.33	2.94	0	0.61
- increase	2.94	3.57	0.89			
Major Yams						
- reduction	8.50	0.89	0.11	-3.59	9.82	0.18
- increase	4.91	10.71	0.48			
Bananas						
- reduction	5.38	7.50	0.69	1.24	-5.11	0.4
- increase	6.62	2.39	0.41			
Plantain						
- reduction	0.88	1.36	0.76	5.00	6.14	0.88
- increase	5.88	7.50	0.83			
Cocoyams						
- reduction	5.59	0	0.16	-2.65	1.18	0.5
- increase	2.94	1.18	0.61			
Sweet Potatoes						
- reduction	11.76	0	0.04	-8.82	0	0.18
- increase	2.94	0	0.32			
Other Staples						
- reduction	2.94	4.46	0.75	-2.94	-0.60	0.67
- increase	0	3.86	0.33			
Other Cash Crops						
- reduction	12.50	16.25	0.65	1.21	-6.64	0.46
- increase	13.71	9.61	0.60			

* Based upon shifts in land allocation, or on changes in seed or plants (inputs): when both were reported, preference was given to recording changes in inputs.

Table 21. Crop Specialization and Crop Complexity *

Women's Crop Specialization: Gungo Peas		Specialization in Major Staples				Specialization in High Value Cash Crops **			
(mean index)		Crop	Migrant (mean index)	Non-migrant	p	Crop	Migrant (mean index)	Non-migrant	p
Migrant	0.07	renta	0.15	0.14	0.86	coffee	0.002	0.004	0.25
		st. vince	0.007	0	0.74	carrots	0.13	0.060	0.04
Non-migrant	0.11	bananas	0.22	0.22	0.98	gungo	0.07	0.110	0.15
		plantain	0.10	0.06	0.25	red peas	0.02	0	0.02
p	0.15					pimento	0.029	0.028	0.97
						cocoa	0.001	0.003	0.25
						scallion	0.003	0.001	0.4
						thyme	0.001	0.003	0.39

Minor Cash and Food Crop Specialization				Cropping Complexity	
Crop	Migrant (mean index)	Non-migrant	p	(mean index)	
tomato	0.002	0.003	0.52	Migrant	0.2797
pumpkin	0.007	0.021	0.06		
ackee	0	0	0.72	Non-migrant	0.3461
chocho	0.001	0	0.22		
bradfruit	0.005	0.005	0.96		
broad bean	0.015	0.014	0.93		
sweet potato	0.017	0.001	0.3		
"other"	0.22	0.31	0.1	p	0.03

* Specialization index: crop output value over total output

Complexity = 1 - sums of squared crop specialization indices

** Some categories may overlap

***"Other" (i.e., minor crops)

Table 22. Mean Livestock Output
(in J.¢)
August 1986 - July 1987

	Total Value					
	End of Year (Vend)			Beginning of Year (Vbeg)		
	Migrant	Non-migrant	P	Migrant	Non-migrant	P
cattle	4129	2886	0.50	4341	2634	0.33
goats	461	300	0.33	513	298	0.32
poultry	89	50	0.13	69	49	0.34
pigs	276	190	0.43	224	96	0.26
horsekind	338	223	0.60	162	205	0.7
other	0	100	0.32	0	100	0.32
total	5295	3657	0.41	5308	3283	0.27
	Losses (2)			Expenditures		
	Migrant	Non-migrant	P	Migrant	Non-migrant	
cattle	82	200	0.56	192	0	
goats	176	0	0.36	24	0	
poultry	4	0	0.36	2	0	
pigs	44	0	0.36	121	59	
horsekind	0	0	n.a.	0	0	
other	0	0	n.a.	0	0	
total	307	200	0.71	338	59 (p = 0.03)	

Table 22. Mean Livestock Output (continued)

	Sales (Cash Receipts)			Assets (Vbeg.) + V(end)/2			Price (5)
	Migrant	Non-migrant	P	Migrant	Non-migrant	P	(mean/unit)
cattle	400	355	0.86	4235	2760	0.41	2000
goats	29	3	0.22	487	299	0.22	200
poultry	0.8	0.1	0.46	79	50	0.18	25
pigs	79	0	0.03	250	144	0.3	400
horsekind	0	0	n.a.	250	214	0.8	500
other	0	0	n.a.	0	100	0.27	30
total	508	359	0.57	5301	3470	0.33	

	Change in Inventory (Vend-Vbeg.) (3)			Gross Income (Vend-Vbeg. + Sales) (4)		
	Migrant	Non-migrant	P	Migrant	Non-migrant	P
cattle	-211	251	0.39	188	607	0.41
goats	-51	2	0.81	-23	5	0.9
poultry	20	0.5	0.2	21	0.7	0.15
pigs	53	94	0.66	131	94	0.71
horsekind	176	18	0.42	176	18	0.42
other	0	0	n.a.	0	0	n.a.
total	-14	367	0.57	495	732	0.69

(1) pigeons

(2) due to theft, predators and/or disease; these losses are included in the change in inventory

(3) home consumption is negligible

(4) See below for Net Cash Income from Livestock

(5) prices differ depending on size of animal

* donkeys/mules

Table 23. Migration Income

	Total n = 34	Reg. 1 n = 6	Reg. 2 n = 8	Reg. 3 n = 7	Reg. 4 n = 5	Reg. 5 n = 3	Reg. 6 n = 5	(p) *
remittance percentage of total migration income	39.47%	75.00%	50.00%	75.00%	75.00%	50.00%	75.00%	0.57
pct. of remittances saved (set aside)	12.35%	75.00%	25.00%	60.00%	70.00%	10.00%	25.00%	0.62
regular schedule of remittances (1)	0.71	0.67	0.63	0.71	0.80	0.88	0.80	0.98
pct. female household heads receiving 100% of remittances	71.47%	58.33%	75.00%	82.14%	77.00%	33.33%	84.00%	0.55
pct. remittance flows to others (2)	16.76%	25.00%	12.50%	17.86%	3.00%	33.33%	16.00%	0.89
remittance expenditure on food as first priority (1)	0.71	0.67	0.50	0.86	0.40	0.67	1.20	0.6
children's education financed by remittances (3)	1.24	1.50	1.25	0.71	1.60	1.33	1.20	0.18
clothing financed by remittances (3)	1.53	1.17	1.25	2.00	1.60	1.33	1.80	0.19
hired labor financed by remittances	1.18	0.83	1.63	1.43	0.80	1.33	0.80	0.24
remittances spent on livestock purchase (1)	0.29	0.50	0.13	0.42	0.40	0	0.20	0.47
remittances spent on "other" (1)	0.47	0.50	0.50	0.57	0.60	0.33	0.20	0.5
pct. food purchases financed by remaining migration income (4)	15.29%	0%	1.88%	10.00%	22.00%	0%	65.00%	0.01
pct. clothing purchases financed by remaining migration income	58.26%	37.70%	66.88%	72.14%	58.00%	6.33%	80.00%	0.19
pct. education financed by remaining migration income	44.12%	45.83%	51.88%	30.00%	60.00%	33.33%	40.00%	0.54
pct. durables financed by remaining migration income	47.21%	50.00%	51.88%	28.57%	58.00%	33.33%	60.00%	0.78
pct. land purchase financed by remaining migration income	23.53%	16.67%	25.00%	42.86%	0%	33.33%	20.00%	0.66
pct. livestock purchase financed by remaining migration income	52.06%	48.33%	75.00%	57.14%	56.00%	33.33%	20.00%	0.47
pct. non-labor crop inputs financed by remaining migration income	59.12%	76.67%	71.25%	75.00%	32.00%	41.67%	34.00%	0.3
pct. remaining migration income spent on hired labor	38.24%	38.33%	35.00%	28.57%	46.00%	50.00%	42.00%	0.96
pct. home construction financed by remaining migration income	47.06%	50.00%	37.50%	57.14%	40.00%	33.33%	60.00%	0.94
pct. other expenditures financed by remaining migration income	13.64%	33.33%	13.75%	10.29%	10.20%	10.33%	30.00%	0.93
pct. total migration income saved	20.88%	28.83%	16.88%	28.57%	17.00%	25.00%	16.40%	0.22

Table 23 (continued)

-
- (1) "yes" assigned score of 1; "no" assigned score of 0.
 - (2) remittances to brothers, mothers, sisters, children or other relatives, i.e., of the 41.47% remittances which are not targeted solely for female heads.
 - (3) 50% or more = 2; less than 50% = 1; none = 0.
 - (4) remaining migration income: income not remitted (including compulsory savings, see below).
 - (5) seed, plants, fertilizer, herbicide.
- * p of Kruskal-Wallis test (chi-square approximation): $t < \text{or} = \text{chisq} = 0.1$.
- **after deducting for cost of living expenses of migrant while in U.S. (approx. 20% of net migration income or a mean cost of J. \$3,491).

Table 24. Cash Savings

(in J.\$)

	Net Cash Income		Expenditures **		Savings (Cash Income - Expenditures)	
	(w. outliers/(w/o outliers)		(w. outliers/(w/o outliers)		(w. outliers/(w/o outliers)	
Migrant (mean)	26.078	26.077	21.470	21.470	4.608	4.608
Non-migrant (mean)	14.021	13.064	11.626	11.601	2.396	1.463
(p)	0	0	0	0	0.4	0.24

* estimated amount saved in a bank account

** total expenditures, including household,
land purchase, cost of living expenditures
of migrants while in the U.S.

Table 25. Mean Household Expenditures
(August 1986 - July 1987)

(in J.\$)

	Migrant	Non-migrant	
	----- (mean)	----- (with outliers) *	(p)
rent	144	54	0.31
home repair	167	495	0.23
water cost	344	120	0.28
electricity cost	696	427	0.07
clothing	3359	1489	0
school costs (1)	1528	1220	0.42
transportation	2748	2096	0.4
medical costs	393	353	0.79
church donations	66	58	0.81
recreation (bar)	543	218	0.24
food expenditures **	5276	3682	0.09
other household expenses ***	2535	1274	0.05
total	17964	11522	0

* households no. 49 and 54.

** This must be added to the mean value of food consumed from own-production (below)

*** Ceremonial expenses (wedding, funeral), cost of constructing a home, or purchase or repair of a vehicle (bicycle, motorcycle or car).

(1) books and transportation; this does not include food (i.e., lunch money) and and costs of clothing (school uniforms and shoes). Most Jamaican schoolchildren attend public school, so there are no attendance fees, as such.

Table 26. Wealth (Assets)

(in J.\$)

	Migrant	Non-migrant
	(mean)	(mean)
Land	21701	28729
House	1796	1545
Livestock *	5301	3470
Vehicle	568	164
Total	29013	33908

* $(V(\text{beg.}) + V(\text{end}))/2$

Table 27. Weekly Farm-household Time-Allocation
(Women and Children)

	Migrant (L.S.M.)*	(S.E.)**	Non-migrant (L.S.M.)*	(S.E.)**	(p)
Labor Hours (per wk.)	44.30	3.15	74.46	2.89	0
Leisure Hours (per wk.)	55.22	3.15	23.06	2.89	0

* Least Squares Means

** Standard Error

General Linear Modelling was

used to control for length of
day (labor hours + leisure hours),
which varied among households.

Labor hours comprise farm and
domestic work, per a.e. (adult
equivalent: 1 stands for 15+ years and
1/2 stands for <15 years of age).

Note:

Adjusted for mean length of day: 14.12 hrs. for migrants and 13.77 hrs. for non-migrant households.

Table 28. Socio-economic Status

	Migrant (mean)	Non-migrant (mean)	(p)
farm size	5.42	6.11	0.61
parental land size (acres) (1)	7.62	8.41	0.75
"agency" relations	0.29	0.1071	0.07
credit (from bank or ag coop)	0.14	0.2143	0.50
female crops (2)	0.47	0.5357	0.61
land size shared with relatives (acres)	3	2.50	0.70
male household head's education (3)	1.73	2.18	0.27
female household head's education (3)	2.07	2.0	0.91
percentage children 12 and above with secondary education	85.71	64.96	0.04
refrigerator (2)	0.53	0.25	0.02
television (2)	0.59	0.39	0.12
vehicle (car, motorcycle) (4)	0.35	0.14	0.23

(1) parents of male and female household heads

(2) "yes" assigned 1; "no" assigned 0.

(3) weighted average: less than primary education = 0; primary education = 1;
primary and basic job training = 2; primary and advanced job training = 3;
secondary school = 4; secondary and advanced job training = 5.

(4) weighted average: bicycle assigned score of zero; motorcycle = 1;
car = 2.

Table 29. Estimated Value of Food Consumed. August 1986 - July 1987

	Migrant (34 households) ----- (mean J.\$)	Non-migrant (28 households) ----- (mean J.\$)	(p)
food consumed from own-production	11468	11612	0.96
food consumed from purchase	5276	3682	0.09
total food consumption (1)	16744	15293	0.63
monthly food consumption (2)	1396	1274	0.63
daily food consumption (3)	46	42	0.63
food consumption per meal (4)	23	21	0.63
food consumption per person (5)	6	5	0.46

(a) + (b): annual, per household

(c) divided by 12

(d) divided by 365

generally two meals a day (at home)

divided by adult equivalents: individuals 15 years and
over (adults) = 1; child (under 15) = 1/2.

Migrant household adult equivalency =

total adult equivalents - 0.5. Since the migrant (a.e. = 1),
is absent approx. 1/2 of the year.

This is a rough estimate based on respondents' estimates
of average monthly food purchases that year. For more
specific consumption estimates, see food expenditure analysis.

Table 30. Mean Weekly Food Expenditures per Household

Food Category -----	Migrant (total = 11) -----		Non-migrant (total = 12) -----		P -----
	Sample Size -----	Expenditure -----	Sample Size -----	Expenditure -----	
A. Unprocessed -----					
Food Item -----					
meat (beef, pork, goat)	4	6.25	3	3.92	0.19
chicken backs	9	5.18	12	3.42	0.12
chicken	8	5.93	4	3.88	0.28
fish (salt fish, salt mackerel, salted and cured red herring)	9	3.56	11	1.79	0.07
vegetables (tomatoes, scallions, cajaloo, cabbage coconuts)	3	1.21	9	1.36	0.88
yams (yellow, etc.)	2	1.09	3	2.52	0.25
B. Processed -----					
Food Item -----					
riber	11	3.14	12	2.52	0.31
corn meal	10	1.12	10	1.11	0.95
bread (hard dough, white sliced, brown sliced)	11	3.97	11	2.53	0.02
rice	11	4.96	11	3.14	0.03
crackers	5	1.05	8	1.36	0.38
patties (beef, pork)	6	1.47	2	1.79	0.76
tinned sardine, mackerel	10	2.08	7	1.30	0.35
tinned beef (i.e., corn beef)	7	2.20	1	2.33	0.90
sugar	11	3.99	11	2.66	0.08
soft drinks (including sugar syrups)	8	2.27	8	1.69	0.60
condensed milk	11	4.85	10	1.82	0
milk (powdered or liquid from powder)	9	1.43	10	1.52	0.90
margarine (including Chiffon and "cut" butter *)	6	1.34	9	0.68	0.04
cooking oil (soy, coconut)	8	3.09	8	2.08	0.35
salt	10	0.99	9	0.65	0.29
seasoning (black pepper, seasoning salt)	5	0.81	5	0.31	0.18
soup mix (i.e., chicken noodle)	3	2.50	6	0.79	0.06
snacks (cheese trix, lollipops, cake)	9	1.23	5	1.05	0.64

Table 30 (continued)

Food Group -----	Migrant (total = 11) -----		Non-migrant (total = 12) -----	
	Sample Size -----	Expenditure -----	Sample Size -----	Expenditure -----
C. Other p ----- -				
restaurant purchases 0.96	2	2.56	1	2.51
alcohol (beer, stout, rum, wine) 0.31	3	3.10	2	1.01
miscellaneous (oatmeal, ice, water, tea, coffee, baking powder, vanilla) 0.04	8	3.57	9	0.91

* margarine cut from a large tin of margarine,
as sold in local shops

** water is sold by the quart in shops
significance level (alpha = 0.10)

Table 31. Mean Weekly Food Expenditures per Adult Equivalent *

Food Category	Migrant (total = 11)		Non-migrant (total = 12)		p
	Sample Size	Expenditure	Sample Size	Expenditure	
A. Unprocessed					
Food Item					
meat (beef, pork, goat)	4	2.57	3	0.79	0
chicken backs	9	2.24	12	0.76	0.07
chicken	8	2.75	4	0.77	0.24
fish (salt fish, salt mackerel, salted and cured red herring)	9	1.17	11	0.39	0
vegetables (tomatoes, scallions, calaloo, cabbage coconuts)	3	0.37	9	0.30	0.72
yams (yellow, etc.)	2	0.25	3	0.62	0.31
B. Processed					
Food Item					
fiber	11	1.10	12	0.55	0
corn meal	10	0.41	10	0.25	0.11
bread (hard dough, white sliced, brown sliced)	11	1.07	11	0.53	0
rice	11	1.99	11	0.72	0
crackers	5	0.29	8	0.33	0.71
patties (beef, pork)	6	0.36	2	0.36	0.99
tinned sardine, mackerel	10	0.53	7	0.35	0.43
tinned beef (i.e., corn beef)	7	1.07	1	0.58	0.63
sugar	11	1.41	11	0.67	0
soft drinks (including sugar syrups)	8	0.58	8	0.39	0.42
condensed milk	11	1.92	10	0.36	0
milk (powdered or liquid from powder)	9	0.52	10	0.34	0.30
margarine (including Chiffon and "cut" butter *)	6	0.37	9	0.15	0.01
cooking oil (soy, coconut)	8	1.41	8	0.44	0.14
salt	10	0.43	9	0.15	0.07
seasoning (black pepper, seasoning salt)	5	0.28	5	0.08	0.09
soup mix (i.e., chicken noodle)	3	0.52	6	0.18	0.10
snacks (cheese trix, lollipops, cake)	9	0.57	5	0.25	0.26

Table 31 (continued)

Food Category -----	Migrant (total = 11) -----		Non-migrant (total = 12) -----	
	Sample Size -----	Expenditure -----	Sample Size -----	Expenditure -----
C. Other P ----- -				
restaurant purchases 0.90	2	0.84	1	0.71
alcohol (beer, stout, rum, wine) 0.36	3	1.32	2	0.31
miscellaneous (oatmeal, ice, water, tea, coffee, baking powder, vanilla) 0.04	8	1.59	6	0.04

* margarine cut from a large tin of margarine,
as sold in local shops

** water is sold by the quart in shops
significance level (alpha = 0.10)
adult equivalent = 1 (15 years and above)
adult equivalent = 1/2 (below 15 years)

Table 32. Anthropometry of Children and Adults (15 - 17 yrs.)

A. By Household Migration Status

Weight-for-Height Z-scores:	Total No. Individuals *	Migrant	Non-migrant	Chi-square = 1.774
-----	-----	-----	-----	df ** = 2
				p = 0.41
less than - 1	11	8	3	
between - 1 and + 1	47	24	23	
greater than + 1	10	5	5	
total no.	68	37	31	

Weight-for-Height Z-scores:

less than - 1	25	12	13	Chi-square = 0.8131
between - 1 and + 1	52	26	26	df ** = 2
greater than + 1	11	7	4	p = 0.66
total no.	88	45	43	

B. By Sex

-----	Total No. Individuals *	Male	Female	Chi-square = 0.35
-----	-----	-----	-----	df ** = 2
				p = 0.83

Weight-for-Height Z-scores:

less than - 1	11	3	6
between - 1 and + 1	47	27	20
greater than + 1	10	3	7
total no.	68	33	35

Weight-for-Height Z-scores:

less than - 1	25	11	14	Chi-square = 1.774
between - 1 and + 1	52	28	24	df ** = 2
greater than + 1	11	7	4	p = 0.41
total no.	88	46	42	

Table 32 (continued)

* z-scores transformed from continuous into categorical data
z-score is defined as the number of standard deviations from the mean
z-score < -1 is less than -1 S.D.; therefore, < -1 S.D. represents 15.9% of population in a normal distribution
z-score greater than $+1$ represents 15.9 percent of population in a normal distribution

** df = degrees of freedom (based on 3 by 2 tables)

alpha < 0.05

APPENDIX B

AGRICULTURE

Mean Annual Output of Individual Crops (Table 8)Tree CropsCoffee

There were no significant differences in mean coffee output. Tree crops such as coffee were becoming a major source of investment for farmers. Both migrants and non-migrants were beginning to invest in coffee most of which is graded as Blue Mountain coffee, which gave a high return do not take into account farmers who had recently invested in coffee but whose trees were still immature and had no yields. The low mean annual gross revenues, J.\$122 and J.\$160 respectively (Table 8.b.) were perhaps due to the large percentage of these young trees which were just beginning to mature and due to a devastating drought during March through June of 1987, whereby a large portion of the harvest was lost. As with other crops, coffee is not irrigated but is cultivated on rainfed slopes. The low output may also reflect the degree of deforestation. Many small farmers intercrop coffee with bananas on hillsides exposed to the harsh sun, hoping that their banana stands will provide sufficient cool shade for the vulnerable young coffee plants. We expected migrants to have higher coffee revenues than non-migrants.

Migrants may have had higher yields and revenues if women in migrant households had maintained the crops better in their absence (i.e., weeded more regularly and on schedule). Both migrants and the agricultural extension agent for the northern region (which specializes in coffee production) complained that some female heads of migrant household had not hired men in time for weeding and had not weeded the coffee in time themselves, which contributed to the poor harvest even in the more densely forested zones.

Another factor which may explain the small difference is the inclusion of two older wealthier farmers in the non-migrant group, the "potential outliers" already mentioned who grew a large amount of coffee. Furthermore, there was a tendency for a sizable number of farmers who were cash poor, to practice kitchen garden agriculture, even when it came to coffee, by growing a few coffee trees in a row in their backyard.

The effects of these intervening variables were tested by controlling for the two large peasant farmers and for small farmers with less than five acres and a gross income of less than J.\$15,000 per year. Mean value of coffee output was J.\$128 for migrants and J.\$202 for non-migrants ($p = 0.4511$) when the intervening variables were controlled for. There were no significant differences between migrants and non-migrants in coffee production.

Non-migrants tended to employ certain methods to overcome cash constraints. Coffee yields were increased by propagating the coffee plants themselves rather than by buying them from the Coffee Board or by manipulating the stems of young coffee trees

(bending them to the ground) in order to increase the number of branches (and berries) per tree.

Cocoa

There were no significant differences in the production of cocoa. In contrast with coffee, cocoa does not require an initial investment. Non-migrants, with less cash income than migrants tended to cultivate more cocoa than coffee. Moreover, farmers reported that their "bonuses" (lump sum installment payments) were not paid on time by the Cocoa Board, whereas coffee "bonuses" were always on time. Besides, the price of coffee per pound was almost six times that of cocoa (J.\$6.31 compared with J. \$1.11). As a result, farmers who could afford to switch from cocoa to coffee, did so. There was a tendency for non-migrants to cultivate more cocoa ($f = 2.11$, i.e., $f > 2$). However, the absence of significant differences in cocoa output between the two groups ($p = 0.15$, i.e., $p > 0.10$) was due to the price effect of coffee and the income effect of migration, and simply the result of the low requirements for labor.

Pimento

There were no significant differences in pimento ("all spice") production. Pimento yields depend on specialized harvesting. Men and women work in small groups and must harvest pimento carefully but quickly. If pimento is not harvested carefully too much of the branch is broken off, the tree is damaged, and it may be three years or more before another harvest

(the harvesting cycle is about two years on average). Since the pimento harvest takes place every two to three years, there is virtually no relationship between its crop cycle and labor requirements on the one hand and migration status on the other hand. The lack of any significant difference in revenues also reflect the use rights of elders in trees. Generally, older family members (parents, aunts or uncles) of the male and female household heads own rights in tree crops, such as pimento or coffee, which they planted years earlier. Even when they have handed over land, they continue to maintain the rights in these crops. Migrants and non-migrants both reported owning the rights or owning only partially use rights to tree crops on land they nominally controlled. The pimento crop was therefore an important cash crop for both groups, as well as for their extended families. Pimento is marketed through the Ministry of Agriculture.

In conclusion, tree crops which are important cash crops will generally not be affected by migration because of low labor requirements, income and price effects (the cross-elasticities of supply with competing crops), and the use rights in trees of older family members, which distribute the disposal (output) of the crop beyond the farm-household.

Short-term Cash Crops ("Catch Crops")

We expect short term crops, that is, with six to sixteen week growing seasons, to decline with migration. Due to the short duration of cultivation and the fact that they are vegetable

crops, most have high require labor requirements for the specialized work of women (weeding "small grass" and harvesting). Women in migrant households will have less time while men to maintain these crops, with the exception of gungo peas. The gungo pea is a crop which women specialize in cultivating and selling for personal profit. Women in migrant families will not have a lower output of this crop than those in non-migrant families.

These are called "catch" crops because they allow farmers to earn money quickly if they "catch" the season.

Carrots

There were no significant differences in yields or revenues. This is probably because women control, in part, the marketing of carrots. A portion of the crop is sold to an agro-industrial firm wholesale the remainder is sold by women themselves on a wholesale or a retail basis. It is also because men often plant more carrots during the season they are at home.

The reason carrot output is not higher among non-migrants is the cost of seed, which can run fairly high (about \$65/lb.). Land preparation for carrots (clean weeding) is also fairly labor-intensive. Migrants have more income to pay hired men. Although they may not have as many crops per year (an average of one crop per year) as do non-migrants (two to three crops per year), their yields are slightly higher. In spite of migration, they are able to invest more in carrot production than non-

migrants (see below).

Tomatoes

Mean value of tomato output and revenues is not significantly different for the two groups. It is also a crop which requires careful weeding (tot. labor hours per acre = 496 hours). Migrant households do not have lower yields because the marketing is done by women.

Pumpkins

Pumpkin revenues were not significantly higher for non-migrants than for migrants ($p = 0.1165$, $\alpha = 0.10$), however, there was a tendency for non-migrants to grow more ($f = 2.54$, i.e., $f > 2$). Pumpkin cultivation does not require a cash investment. Farmers usually plant the seed of their better quality pumpkins from a previous harvest or get seed from relatives or friends. It grows on a vine and has relatively low labor requirements.

Migrants were able to cultivate as much as those who did not leave Jamaica that season. However, considering it is inexpensive to cultivate we were surprised non-migrants did not have a higher output. We then learned from farmers that the market for pumpkins was depressed, since farmers had to rely solely on the small domestic market. Pumpkins were not exported after it was discovered that ganja (marijuana) was smuggled inside the gourds. Non-migrants were therefore not inclined to allocate greater land area than migrants to increase pumpkin output.

A.2.3. "Condiments"

Using the classification of the Ministry of Agriculture, we define scallion and thyme as condiments. They are crops which have moderate to low labor requirements. We therefore did not expect any differences in output with migration.

Scallion

The results in the above tables reveal no significant differences in scallion output value. This is a crop that can be harvested, at most, twice a year due to a six-month crop cycle. They require mulching, a fairly moderate initial labor investment, and a low annual investment in labor which migrants tend to hire when fields are at significantly greater distances (and higher altitudes) from their residences.

Thyme

Labor requirements for thyme are fairly low and the initial investment (in cash) is negligible. Migration therefore has no effect.

A.2.4. Legumes

We expect lower mean output among migrants, with the exception of gungo peas, the primary crop women specialize in.

Gungo Peas

There are no significant differences in gungo revenues and yields. Gungo peas is the major women's cash crop in the region.

Both "migrant" and "non-migrant" female household heads used this crop as a source of extra income over which they had complete disposal.

Women cultivated this crop for men and for themselves despite the high labor requirements of 501 personhours per acre (see Table 11). This demonstrates that women in migrant households did not give up their income-generating activities, even though migrants earned significantly higher cash incomes.

Broadbeans

We did not expect any significant differences in broadbean yields and revenues. Broadbean is a crop both men and women cultivate. It is a vine, with low labor requirements. Here again, little or no initial cash investment is needed (except for those who must purchase wood for an arbor). As anticipated, mean broadbean output was not affected by migration.

Red Peas

Migrants' output was higher than that of non-migrants, which was negligible. It is a female labor-intensive crop for which female exchange or hired labor is necessary. Migrants tended to hire women for red peas cultivation (92 percent), while non-migrants did not hire any. Single men (migrant and non-migrant) complained that they were unable to find enough women to weed red peas. This is also a crop women may cultivate separately, which may explain the tendency for migrant households to produce more. Non-migrants reported hardly sowing any that year because it is a "grudgeful" crop and because they had lost most of their red peas

crop during the previous season's drought. Considering the high labor requirements along with the high risk involved with its cultivation that year, it was easier for migrants to risk cultivating this crop than it was for non-migrants.

A.2.5. Staples

Staples output consists of major staples, which we have classified into primary and secondary staples, as well as minor (or "other") staples.

Primary Staples

There were no significant differences in mean output of the major staples: renta and st. vincent yams, bananas, plantains and breadfruit. These crops require relatively little labor over their respective crop cycles (nine months for yams versus one year for bananas and plantain) or during the season migrants are absent from their farms, since they can be planted throughout the year, especially during the rainy seasons.

Renta yams, bananas and plantain, in particular, were important cash crops. Wheat flour is the major purchased staple and is used both as a complement (in the form of dumplings) as well as a substitute for yams, depending upon the season. With the exception of renta yams, the purchasing (or sales) price of one pound of wheat flour (J.\$1.90) was higher than the sales price of a pound of these major staple crops (see Table A.2.c.). However, the price of renta yams (J.\$2 a pound) was about equal to the price of wheat flour. Since small farmers in these regions

planted the domestic banana variety, bananas could not be sold to the agricultural marketing board (Banana Board) and were marketed by women, as were the other staples. Migrants did not suffer less output with respect to non-migrants. (see also Table A.7.).

Secondary Staple

Sweet Potatoes

There were no significant differences in sweet potato output, however, relatively more migrants (76%) cultivated them than non-migrants (46%). Since it is not a crop which requires a high initial labor investment, non-migrants tended to diversify their production of other "minor" staples (coco, other yams, cassava, corn and irish potato) more see Table A.19.). As with other staples, it was cheaper to produce sweet potatoes than to purchase them or substitutes for them, so households did not reduce labor to this crop, hence migration did not have an income effect on sweet potato production.

Some farmers considered cocoyams (or coco) a secondary, or even a primary staple, however, we found that sweet potato ("potato") production was more prevalent throughout the region. This is because cocoyams need fertile soils but soil can be replanted every season on even depleted soils. We have therefore classified the cocoyam as a minor staple.

Other Major Vegetable Crops

Ackees and chochos are important vegetable crops which are

not "catch" crops but are important in the diet. Labor requirements for these crops are low.

Chocho

This cucumber-like crop grows on a vine and has negligible labor requirements. Women tend to cultivate chochos and control the revenues from sales.

There were no significant differences in output ($p = 0.14$), although there was a tendency for migrants to cultivate more ($f = 2.13$). The mean annual output seems low. This may be from underreporting, but in view of the detailed information and cooperation from women with regard to their sources and levels of income, we doubt this is the case. Households reported harvesting two to three per week, mostly for home consumption (see Table A.16.). This may have been due to the low price.

Ackee

No significant differences were found in ackee production. The ackee is a tree crop with low labor requirements (some pruning and weeding). Migration would not have any significant effect on ackee output. With the exception of those peasant farmers with the largest amounts of land, who owned ackee trees in sufficient numbers to be sold to middlemen, small farmers generally lost a significant amount of their ackee harvest. There was generally an oversupply on the market during ackee seasons and the price extremely low. The growing seasons of ackees and other tree crops could not be manipulated as could that of other crops, given certain limits, which allow farmers to

take advantage of better market prices. Differences in mean output were therefore not statistically significant.

A.2.8. Other Crops

The number of of different crops in this category, forty-five in all, is fairly large (see Table 9). The volume of output was in some cases so small that farmers could only report estimates.

We expected migrants to have lower output of other or minor crops than non-migrants. There are no significant differences in mean output of "other" (minor) crops cultivated (at alpha = 0.10). However, there was a tendency for non-migrants to cultivate relatively more minor crops than migrants (see Table 8.d.).

By Migration Status (Table 12)

Tree Crops and Major Short-term Cash Crops

There is no home consumption of coffee. For the other major tree and vegetable cash crops: cocoa, pimento, carrots, tomatoes, pumpkins, scallions and thyme, home consumption is negligible.

Legumes

Mean consumption of gungo peas, the major legume in the diet, is 0.13 percent of gross output, whereas broadbean and red pea production is largely sold.

Primary Staples

There are no significant differences in sales and consumption of own-produced staples at the regional level. Considering the purchasing price of staples, we would have expected non-migrants, earning a lower annual (see Table 13) income, to sell less and consume more own-produced staples than migrants. This would be with the exception of the lower-lying coastal districts, which specialize in cultivating bananas and plantain for the market (Table 14, see discussion below).

We divided the sample into five income classes (Table 15). Regression analysis showed that income class did not significantly influence output of the major staples. However, the total number of household members under fifteen had a significant but a weak effect, at a significance level (alpha) of 0.10 ($p = 0.0263$). The model is: $R\text{-square} = 0.1971$

$$Y = 7121.98 + 1690.86 X \quad \text{or:}$$

$$\text{staples output} = 7121.98 + 1690.86 \text{ under-fifteen}$$

No other systematic influences could be found.

Secondary Staples

There seem to be no significant differences in breadfruit sales and consumption. However, migrants seem to sell more sweet potatoes than non-migrants (25% vs. 18%, $p = 0.085$).

There were no significant differences in the marketing of the majority of staples (Table A.18). However, migrants appear to have sold a higher percentage of their cocoyams (44% vs. 26% for non-migrants; p , coco sold = 0.0508) and corn (p , corn sold = 0.0393), while non-migrants sold a higher percentage of their breadfruit crop (p = 0.0051).

Interestingly, cocoyams and corn are considered nutritious staples by small farmers. Non-migrants seem more reluctant to sell these crops since they cannot substitute as much wheat flour for home-grown staples as can migrants. Breadfruit, on the other hand, grows so abundantly that losses due to spoilage (while still not harvested) run fairly high. Non-migrants would be less likely than migrants to forego the extra revenues breadfruit could provide.

By Region

There are significant regional differences in mean coffee, thyme, carrot, cocoa and plantain output and sales but not in banana or in scallion output and sales. We also find regional differences in gungo, red peas and pimento output and sales. This would suggest that red peas is cultivated mostly in the mist forest above the northernmost districts, while gungo peas, which does well in warmer climates, is raised primarily in southern districts.

Pimento may be grown more in subregions 1 and 3, which contain more forest than other zones. When we examined pimento

production in the six regions (sub-regions) we found the following pattern:

Value of Pimento Output

<u>Region</u>	<u>Migrants</u> (J.\$)	<u>Non-migrants</u> (J.\$)	p
1	917	401	0.3144
2	901	386	0.3550
3	554	897	0.5685
4	0	39	0.2199
5	472	300	0.6770
6	538	100	0.4661

Pimento output was highest (overall) in region 3, the densely forested southern central zone, and lowest in region 4 (landless zone in costal plains). However, region 6, the southernmost zone nearest the coast had higher pimento output than was expected. Although this zone comprised mainly tenants, some farmers, some farmers did own some land. In region 4, land that was owned was held communally and output of tree crops such as pimento was owned by older family members.

Our conclusion is that regions 1 and 3 did have higher pimento output and sales but that this was not concentrated in these two regions alone but was widely cultivated in all ecological zones.

There were no significant regional differences in scallion output and sales because it is a crop which can be cultivated in any of the six sub-regions.

The reason for the absence of significant regional differences in banana output is explained by the importance of green (i.e., unripe) cooked bananas in the diet of the Jamaican peasantry and of low income Jamaicans. This may diffuse small

regional differences in market specialization.

Table A.17. shows that only in the cultivation of plantain was region a significant factor. Region 6 had the highest amount of plantain cultivation: migrants produced 31.0% of total plantain output and non-migrants 30.8% of total plantain output.

Staples Production for the Market

Income class as well as household composition determine the amount of a staple grown or consumed by a farm-household. The lower the income class the more home grown staples are consumed, assuming prices for these staples and their purchased substitutes remain stable. The more children (those under fifteen), the more staples will be grown, regardless of income. coastal zone (regions 4 and 6) more staples would be sold.

In Table 15.b. we divided the sample population into five income classes. Income Class 1, the lowest income class, comprises farm-households which earn less than J.\$13,000 per year in gross income. Income Class 2 is made up of farm-households with a gross income of between J.\$13,000 and J.\$25,999 per year. Those controlling an annual gross income between J.\$26,000 and J.\$39,999 belonged to Income Class 3. Income Class 4 was defined as those who had gross incomes of from J.\$40,000 to J.\$59,999. Income Class 5 grossed between \$60,000 to \$72,000. General linear modeling controlling for migration status and income class. GLM was used here instead of regression since, due to the number of different income classes, the subsample size of each

income class would be too small to be statistically significant for regression analysis. The following data is reported by migration status and by income class.

Income class was a significant factor in the market production of particular staples. Migrants as a whole and those in Income Class 3 sold a significantly higher percentage of breadfruit than non-migrants or the other income classes. Migrants and non-migrants in Income Class 3 sold a higher percentage of bananas. Income Class 1 sold a higher percentage of bananas than did all other groups. Migrants sold a higher percentage of coco than non-migrants, regardless of income class. The percentage corn sold was significantly higher among migrants than non-migrants, regardless of income class. Income Class 3 sold a higher percentage of yams than other groups. No systematic effects could be attributed to region or to household composition.

APPENDIX C

INTERVIEW SCHEDULE 1

IF MIGRANT: WHEN LEFT? WHEN RETURN?

I. DISTRICT:

II. REGION:

III. MIGRANT/FARMER'S NAME AGE:DATE OF BIRTH:PLACE OF BIRTH:HOUSEHOLD CHARACTERISTICS:IV. WIFE/GIRLFRIEND'S NAME AGE:DATE OF BIRTH:PLACE OF BIRTH:LIVING TOGETHER? YES/NOIF NO, WHO IS WIFE/GIRLFRIEND LIVING WITH?

NAME:

RELATIONSHIP:

ADDRESS:

V. CHILDREN: YES/NOHOW MANY?AGE, DATE OF BIRTH SEX OF EACH CHILD:CHILDREN UNDER FIVE: YES/NONAMES, AGES AND SEX OF CHILD:

VI. OTHER MEMBERS OF HOUSEHOLD: MOTHER, FATHER, AUNTS, UNCLES, IN-LAWS, FRIENDS, COUSINS, ANY CHILDREN BY OTHER BABY MOTHERS/BABY FATHERS OF SELF OF WIFE/GIRLFRIENDS, WORKS/EATS TOGETHER WITH YOU AND PUTS MONEY IN ONE POT.

NAME:	RELATIONSHIP	AGE	HOW LONG?
<u>EAT/WORK</u>	<u>HOME/OUTSIDE</u>		

VII. CHILDREN BY OTHER BABY MOTHERS/BABY FATHERS NOT LIVING WITH YOU:
 NAME: AGE: SEX: M/F RELATIONSHIP(WHOSE CHILD)

FINANCIAL SUPPORT TO CHILD: YES/NO

WHAT KIND?

CASH? HOW MUCH? (1X/WK., 1X/2WKS., 1X/MO. 1X/3MO.)
 OCCASIONALLY

NON-CASH? (1X/WK., 1X/2WKS., 1X/MO. 1X/3MO.)
 OCCASIONALLY

DISTRICT: REGION MIGRANT/FARMER'S NAME:

WHO DOES CHILD LIVE WITH: HOW LONG?

IF CHILD IS LIVING WITH YOU, DO YOU GET SUPPORT FROM PARENT OF CHILD?
 CASH HOW MUCH (10/20/30/10/50/60 J) HOW OFTEN?
 CLOTHING HOW MUCH HOW OFTEN?
 FOOD HOW MUCH HOW OFTEN?
 WORK WHAT KIND HOW OFTEN

PHYSICAL CHARACTERISTICS

DO YOU RENT/OWN YOUR HOME?
 IF OWNED, DID YOU BUILD YOUR HOME? WHEN?
 HAVE YOU PUT ON EXTRA ROOMS TO YOUR HOME?
 HOW OLD IS YOUR HOME?
 WHAT IS IT MADE OF?
 DO YOU OWN ANY OTHER HOMES?
 ELECTRICITY?
 RUNNING WATER?
 REFRIGERATOR?
 RADIO?
 T.V.? BATTERIES YES/NO
 LAND AROUND HOUSE YES/NO
 HOW MUCH (ACRES)
 RENTED/OWNED

CHURCH AFFILIATION

WHAT CHURCH DO YOU ATTEND?
 ACTIVITIES:
 WHEN DO YOU ATTEND? EVERY WEEK, PASTOR SUNDAY, SPECIAL OCCASIONS
 (CHRISTMAS, ETC.)

COMMUNITY ACTIVITIES AND SPORTS ACTIVITIES YES/NO

Member of Parish Council, Selection Committee for farmworkers, member of youth club, football team, dominoes, cricket team, musician, band, golden age club, women's committee, volunteer work.

Self: Husband/Boyfriend, Wife/Girlfriend

SOCIAL NETWORKS

IN WHAT DISTRICTS DO YOU HAVE CLOSE RELATIVES/FRIENDS WHOM YOU VISIT OFTEN?

1X/WK. 1W/2WKS. 1X/3WKS. 1X/MO.

WHO? DISTRICT RELATIONSHIP

DO YOU BUY/SELL OR GET/GIVE AWAY FOOD TO THEM?

FOOD BUY/SELL AMT GET/GIVE AWAY AMOUNT (pounds, qts., bags, tins, ties) WHEN

DO YOU EXCHANGE CLOTHES, WORK, CARE OF CHILDREN, COOKING WITH THEM?
YES/NO HOW OFTEN? 1 WK 1MO. SOMETIMES

IF YES, WHO?

DO YOU SELL AT THEIR MARKET? YES/NO

WHAT DO YOU SELL/BUY?

DO THEY BUY/SELL AT YOUR MARKET? YES/NO

WHAT DO THEY BUY/SELL?

ARE YOUR PARENTS LIVING? FATHER MOTHER WHERE?

HOW MANY BROTHERS AND SISTERS DO YOU HAVE?

WHERE DO THEY LIVE?

ANY RELATIVES/IN-LAWS ABROAD? YES/NO

WHO RELATIONSHIP WHERE REMITTANCES (CASH, NON-CASH)

HOW MUCH, AMOUNT, HOW

DISTRICT REGION MIGRANT/FARMER'S NAME

MIGRATION HISTORY

MIGRANTS

HOW MANY YEARS HAVE YOU DONE FARMWORK ABROAD?

WHERE?

APPLES _____

SUGAR _____

PEACHES _____

OTHER _____

WHAT KIND OF WORK DO YOU DO?

HOW MUCH DID YOU GET PAID LAST YEAR?

WHAT DID YOU USE YOUR FORTNIGHTLY INCOME FOR? (LIST 5 IN ORDER OF IMPORTANCE)

WHAT DID YOU USE YOUR COMPULSORY SAVINGS FOR? (LIST 5 IN ORDER OF IMPORTANCE)

HAVE YOU EVER TRAVELLED FOR ANY OTHER REASON? (SELF, HUSBAND/BOYFRIEND, WIFE)

WHEN? HOW LONG? WHAT PURPOSE? WHERE?

HEALTH/MEDICAL HISTORY

HAS ANYONE IN THE HOUSEHOLD HAD ANY PROBLEMS WITH THEIR HEATH?

NAME, RELATIONSHIP, AGE: PROBLEM NURSE, DOCTOR, OTHER

HAS ANYONE IN THE HOUSEHOLD DIED WITHIN THE PAST YEAR/ YES/NO

WHO? AGE WHY?

HAVE YOU HAVE ANY CHILDREN WHO HAVE DIED?

WHEN AGE OF CHILD SEX OF CHILD WHY?

(WOMEN) HAVE YOU EVER HAD A MISCARRIAGE? HOW MANY? WHEN?

HAS ANYONE IN THE HOUSEHOLD HAD ANY HEALTH PROBLEMS IN THE LAST THREE MONTHS? (mo) PROBLEM AGE NURSE, DOCTOR, OTHER

CHILDREN UNDER FIVE:

RESPIRATORY PROBLEMS (FLU, ASTHMA, BRONCHITIS, BREATHING PROBLEMS WHEEZING, RUNNY NOSE) IN LAST 3 MONTHS

NAME MONTH AGE HOW LONG

DISTRICT REGION MIGRANT/FARMER'S NAME

CHILDREN UNDER FIVE (CONTINUED)

RUNNIN, BELLY MO. AGE SEX HOW OFTEN? WITH BLOOD: HOW LONG?

VOMITING/

FEVER? MO. AGE SEX

PROBLEMS WITH WEIGHTGAIN? WHEN? HOW MUCH UNDERWEIGHT? AGE
SEX

RUNNING EARS? MO. AGE SEX

WHEN DID YOU LAST TAKE THE CHILD TO THE CLINIC?

WHY?

WERE YOU GIVEN ANY ADVICE?

DID YOU SEE NURSE, MIDWIFE, DOCTOR, HEALTH AIDE?

HEALTH SERVICES UTILIZATION

WHO DO YOU GO TO FOR YOUR HEALTH CARE?
(NURSE, MIDWIFE, DOCTOR, AIDE, OTHER)

HOW OFTEN DO YOU VISIT THE DOCTOR?
WHERE DO YOU GO?
WHOM DO YOU TAKE TO THE DOCTOR, BESIDES YOURSELF?

IF YOU DO NOT HAVE RUNNING WATER, WHERE DO YOU GET YOUR WATER? (PIPE, SPRING RIVER, TRUCK)

DO YOU BOIL IT?
DO YOU USE LATRINE OUTSIDE/INSIDE?

EDUCATION

HOW MANY CHILDREN ATTEND SCHOOL? BASIC, ALL-AGE, PRIMARY, SECONDARY, HIGH SCHOOL, UNIVERSITY, TRAINING CENTER?

NAME	AGE	COST	WHO PAYS
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Many farmers did not have the chance to attend school regularly or to finish school when they were young because they had to help their parents in their fields.

How often were you able to attend school? 1x/wk, 2x/wk, 3x/wk, every day

Where did you attend? was it all-age, primary, secondary, high school, training center, other?

What trade were you trained in?

How old were you when you left school? what grade?

Why did you leave school? finished _____ other _____

Female household head: How often attended school?

Where?

What trade?

How old when left? What grade?

Reason for leaving school?

Have you attended any adult education classes? yes/no When?

How Long? What classes?

Would you like to attend adult education classes? yes/no

In what area?

DISTRICT

REGION

MIGRANT/FARMER'S NAME

SOCIO-ECONOMIC BACKGROUND

HOW MUCH LAND DID YOUR PARENTS CULTIVATE? _____
OWN RENT/ _____

WERE YOU RAISED BY YOUR PARENTS? YES/NO

IF NO, BY WHOM? (GRANDPARENTS, AUNTS, OTHER RELATIVES, FAMILY FRIENDS)

DID THIS PERSON SUPPORT YOU? (1/4, 1/2, 3/4, COMPLETELY)

HOW MUCH LAND DID HE/SHE CULTIVATE? _____ OWNED/RENTED _____

WHO STARTED YOU IN FARMING? _____

WHO GAVE YOU YOUR FIRST PARCEL OF LAND, LIVESTOCK _____

AGRICULTURE

CROPS

WHAT KINDS OF CROPS DO YOU GROW?

<u>LIST</u>	<u>SEASONS</u> (planted/ harvested)	<u>ON HOW MUCH LAND</u>	<u>QUANTITY</u> (pounds, bags, tins, ties)
			<u>CROPS HARVESTED LAST</u> <u>TWOSEASONS</u>

LIST THE 5 MOST IMPORTANT CROPS YOU SELL (IN AMOUNT OF MONEY)

- 1st most important _____
- 2nd most important _____
- 3rd most important _____
- 4th most important _____
- 5th most important _____

LIST THE 5 MOST IMPORTANT CROPS YOU EAT THAT YOU GROW YOURSELF

- 1st most important _____
- 2nd most important _____
- 3rd most important _____
- 4th most important _____
- 5th most important _____

Yam
Renta _____
St. Vincent _____
Lucea _____
Negro _____
Yellow Yam
Irish Potato _____
Corn _____
Okra _____
Pumpkin _____
Turnip _____
BeetRoot _____
Breadfruit _____
Jackfruit _____
Ackee _____
Chocho _____
Chocolate _____
Coconut _____
Cane _____
Mango _____
 Common mango _____
 Beefie _____
 Julie _____
 bombay _____
 In-grafted _____
 Other _____
Banana _____
Plantain _____

Tomato _____

Lime _____

Orange _____

Tangerine _____

Grapefruit _____

Lemon _____

DISTRICT	REGION	MIGRANT/FARMER'S NAME	DANDELION
ROOT	_____	_____	_____
PIMENTO	_____	_____	_____
CASHEW	_____	_____	_____
NASEBERRY	_____	_____	_____
DEW PLUM	_____	_____	_____
PEPPER	_____	_____	_____
COMMON PEPPER	_____	_____	_____
SCOTCH BONNET	_____	_____	_____
SWEET PEPPER	_____	_____	_____
PINEAPPLE	_____	_____	_____
COW GRASS			
AFRICAN STAR	_____	_____	_____
GUINEA GRASS	_____	_____	_____
OTHER	_____	_____	_____
LUMBER/FIREWOOD TREES			
CEDAR	_____	_____	_____
MAHO	_____	_____	_____
MAHOGANY	_____	_____	_____
MOSSWOOD	_____	_____	_____
TAMBRIN	_____	_____	_____
DAMSEL (firewood)	_____	_____	_____

WHO HELPS YOU GROW THESE CROPS? (family, friends, partners, neighbors, workers)

NAME	ADDRESS
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

DISTRICT

REGION

MIGRANT/FARMER'S NAME

DRAW A PICTURE OF YOUR FIELD(S)LAND TENURE

HOW MUCH LAND DO YOU CULTIVATE ON? (chains, acres) _____

HOW MANY FIELDS DO YOU CULTIVATE _____

HOW MANY ACRES IS IN EACH FIELD/PIECE? _____

WHAT FIELDS DO YOU USE FOR PASTURE? _____ ACRES _____

ARE THESE SEPARATE FROM THE FIELDS YOU CULTIVATE? YES/NO

WHERE ARE THE FIELDS YOU USE FOR CULTIVATION? _____

WHOM DOES EACH PIECE OF LAND BELONG TO? _____

ARE THE PIECES YOU OWN SHARED WITH ANY OTHER FAMILY MEMBERS? YES/NO

IF YES, WHAT PIECES ARE SHARED, AND HOW LARGE IS YOUR PART(S)? _____

IF NOT OWNED, DO YOU RENT, LEASE OR OCCUPY LAND YOU CULTIVATE? YES/NO

HOW MUCH OF YOUR LAND DO YOU RENT, LEASE OR OCCUPY? _____ COST: _____

DO YOU RENT LAND TO ANYONE? YES/NO HOW MUCH? _____ COST: _____

DO YOU RENT, LEASE OR OCCUPY PASTURE LAND? YES/NO HOW MUCH _____
COST: _____HAVE YOU GIVEN A PIECE OF LAND TO ANYONE? YES/NO WHOM?
_____ (relationship) HOW MUCH? _____

DO YOU RENT A HOUSE TO ANYONE? A ROOM? _____

FOR HOW MUCH? _____ TO WHOM? _____
(relationship)

DISTRICT _____ REGION _____ MIGRANT/FARMER'S NAME _____

HAVE YOU BOUGHT ANY LAND WITHIN THE LAST 12 MONTHS? _____

WITHIN THE LAST 2 YEARS? _____ HOW MUCH? _____ COST: _____ /ACRE

WITHIN THE LAST 1 YEAR? _____ WHEN? _____ (YR.) COST: _____ /ACRE

LIVESTOCK

DO YOU HAVE COWS, GOATS, COMMON FOWL, DONKEYS, MULES, HORSES, PIGS? (circle)

HOW MANY COWS DO YOU HAVE? _____ WHAT KIND? _____

ANY IN-CALF? _____

HOW MANY CALVES DO YOU HAVE? _____ (BULL CALVES?) _____

HOW MANY BULLS DO YOU HAVE? _____

DO YOU SELL CALVES? _____ WHEN? _____ (occasion) COST _____

DO YOU SELL COWS/BULLS? _____ WHEN? _____ (occasion) COST _____

HAVE YOU SOLD ANY COWS/BULLS/CALVES OVER THE PAST 12 MOS.? _____ HOW

MANY? _____ WHY? _____ COST _____

DID YOU BUY ANY COWS/BULLS/CALVES OVER THE PAST 12 MONTHS? _____ HOW

MANY? _____ WHY? _____ COST: _____ HOW WERE

YOU ABLE TO PAY FOR IT? _____ (terms, where money

came from) _____

DO YOU USE/SELL THE MILK? YES/NO. IF YES, HOW MUCH DO YOU SELL IT FOR?

_____ /QUART.

IF YOU USE THE MILK, WHAT DO YOU USE IT FOR? (drinking, cooking,

_____ calf) _____ DO YOU RENT OUT BULLS FOR SERVICING? _____ FOR

HOW MUCH? _____ WHAT DO YOU USE THE INCOME FROM SELLING THE COWS

FOR? _____

HOW MANY GOATS DO YOU HAVE? _____ ANY IN-KID: _____

HOW MANY HOW MANY KIDS DO YOU HAVE? _____

HAVE YOU SOLD ANY GOATS OVER THE PAST TWELVE MONTHS? _____ HOW MANY?

_____ WHY? _____ COST: _____

HAVE YOU GIVEN AWAY ANY GOATS OVER THE PAST 12 MONTHS? _____

WHY? _____ TO WHOM? _____ DID YOU RECEIVE ANYTHING IN

RETURN? YES/NO IF YES, WHAT? _____ (work, food,

animals, etc.)

WHAT DID YOU USE THE INCOME FROM SELLING THE GOATS FOR? _____

HAVE YOU BOUGHT ANY GOATS OVER THE PAST 12 MONTHS? _____ HOW

MANY? _____ WHY? _____ HOW WERE YOU ABLE TO PAY

FOR IT? (terms, where money came from) _____

DID YOU GET ANY GOATS OVER THE PAST 12 MONTHS? YES/NO. IF YES, DID YOU

GIVE ANYTHING IN RETURN? (work, food, animals, etc.)

HOW DO YOU USE THE MILK? (drink, give away, allow kid to

suck) _____

HOW MANY COMMON FOWL DO YOU HAVE? _____ HOW MANY

CHICKENS? _____ DO YOU SELL THEM? _____ FOR HOW MUCH?

_____ DO YOU EAT THEM? _____ DID YOU SELL ANY IN THE LAST

12 MONTHS? YES/NO FOR HOW MUCH? _____ HOW MANY? _____

DID YOU BUY ANY IN THE LAST 12 MONTHS? YES/NO FOR HOW MUCH? _____ HOW

MANY? _____

HOW MANY DONKEYS/MULES/HORSES DO YOU HAVE? _____ HAVE YOU

BOUGHT ANY IN THE LAST 12 MONTHS? _____ HOW WERE YOU ABLE TO

DISTRICT REGION MIGRANT/FARMER'S NAME

PAY FOR IT? _____
 HOW MANY PIGS DO YOU HAVE? _____ HAVE YOU BOUGHT ANY IN THE LAST
 12 MONTHS? _____ HOW MANY? _____ FOR HOW
 MUCH? _____
 HAVE YOU SOLD ANY IN THE LAST 12 MONTHS? _____ HOW MANY?
 _____ FOR HOW MUCH? _____ WITH WHAT INCOME DID YOU BUY
 THEM? _____ IF SOLD, WHAT DID YOU USE THE INCOME
 FOR? _____

WHO ATTENDS THE LIVESTOCK:

	<u>ANIMAL</u>	<u>HRS./WK.</u>	<u>DAYS/WK.</u>	<u>\$/DA</u>
SELF	_____	_____	_____	_____
WIFE/GIRLFRIEND	_____	_____	_____	_____
HIRED MAN/CHILD	_____	_____	_____	_____
OWN CHILD (REN)	_____	_____	_____	_____
UNPAID FRIEND	_____	_____	_____	_____
PAID FRIEND	_____	_____	_____	_____
PARTNER	_____	_____	_____	_____

(MIGRANTS) WHO TENDS LIVESTOCK IN YOUR ABSENCE? _____

OTHER ECONOMIC ACTIVITIES

DO YOU DO ANY OTHER WORK BESIDES FARMING? (Carpentry, masonry, tailoring, common laborer, FIDCO, Serge, Moy Hall, Parish Council, Min. of Agriculture, Carreras, Woburn Lawn Project, Driver, Spraying Coffee, Road Work, Selling Drinks, /Food, Carrying loads, domestic work, work for other small farmer, work for large farmer, musician, deacon in church, buying and selling crops in the market past 12 months.

HRS./WK., DAS./WK, WKS/YR, \$/DA/MONTH(S)

Self _____

Wife/Girlfriend _____

Other Adults in Home (incl. children) _____

Children 8-18 years _____

DISTRICT REGION MIGRANT/FARMER'S NAME

(MIGRANT) (FROM FARMWORK) _____

DECEMBER _____
NOVEMBER _____
OCTOBER _____
SEPTEMBER _____
AUGUST _____

LOSSES

HOW MANY CROPS DID YOU LOSE DURING THE DROUGHT IN 1986 _____

HOW MUCH LIVESTOCK DID YOU LOSE DURING THE DROUGHT IN 1986 _____

HOW MANY CROPS DID YOU LOSE DURING THE FLOOD OF JUNE 1986 _____

HOW MUCH LIVESTOCK DID YOU LOSE DURING THE FLOOD OF JUNE 1986 _____

HAVE YOU LOST ANY CROPS FROM SPOILAGE BEFORE SELLING, (FROM RATS, MICE, LACK OF TRANSPORTATION/PROPER STORAGE) _____

WHAT CROPS DO YOU LOSE MORE THAN OTHERS? _____

HOW MUCH DO YOU LOSE?

JULY - SEPTEMBER less than 1/4, 1/4, 1/3, 1/2, more

CROP _____

DISTRICT REGION MIGRANT/FARMER'S NAME

OCTOBER - DECEMBER less than 1/4, 1/4, 1/3, 1/2, more

CROP _____

JANUARY - less than 1/4, 1/4, 1/3, 1/2, more

CROP _____

WHO CONTROLS THE BUDGET? HOW MUCH (1/4, 1/2, 3/4, ALL)? WHAT? (land, seed, livestock, type of crop, home, recreation, school, doctor, food, clothing)

HUSBAND/BOYFRIEND _____
WIFE/GIRLFRIEND _____
FATHER/MOTHER _____
FATHER-IN-LAW/MOTHER-IN-LAW _____
UNCLE _____
AUNT _____
GRANDFATHER/MOTHER _____
OTHER RELATIVE _____
PARTNER/FRIEND _____

(MIGRANT) WHEN MAN IS AT HOME (ABOVE) WHEN MAN IS AWAY

WIFE/GIRLFRIEND _____
FATHER/MOTHER _____
FATHER-IN-LAW/MOTHER-IN-LAW _____
UNCLE _____
AUNT _____
GRANDFATHER/MOTHER _____
OTHER RELATIVE _____
PARTNER/FRIEND _____

DIET/FOOD:

WHAT DID YOU EAT YESTERDAY? (Male household Head)

breakfast _____
lunch _____
snacks _____
dinner _____

WHAT DID YOU EAT YESTERDAY? (Female Household Head)

breakfast _____
lunch _____
snacks _____
dinner _____

IF YOU HAVE CHILDREN UNDER FIVE, WHAT DID THEY EAT YESTERDAY?

breakfast _____
lunch _____
snacks _____
dinner _____

DISTRICT	REGION	MIGRANT/FARMER'S NAME				
HOUSEHOLD	TIME	(see questionnaire)				
		<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>
5-6	am					
6-7	am					
7-8	am					
8-9	am					
9-10	am					
10-11	am					
11-12	pm					
12-1	pm					
1-2	pm					
2-3	pm					
3-4	pm					
4-5	pm					
5-6	pm					
6-7	pm					
7-8	pm					
8-9	pm					
9-10	pm					
		<u>Saturday</u>		<u>Sunday</u>		
5-6	am					
6-7	am					
7-8	am					
8-9	am					
9-10	am					
10-11	am					

DISTRICT REGION MIGRANT/FARMER'S NAME 11-12 pm

Saturday

Sunday

12-1 pm

1-2 pm

2-3 pm

3-4 pm

4-5 pm

5-6 pm

6-7 pm

7-8 pm

8-9 pm

9-10 pm

(MIGRANTS)

HAVE YOU HAD ANY PROBLEMS GETTING MEN/WOMEN/CHILDREN TO HELP YOU ON YOUR FARM SINCE YOUR HUSBAND/BOYFRIEND HAS BEEN AWAY?

WHO?	HOW MANY HRS./DA. WORK WAS NEEDED?	WHO DID THE WORK? (Relationship)	HRS./DA., DAS/WK.	COST
------	---------------------------------------	-------------------------------------	-------------------	------

WHY DID YOU HAVE PROBLEMS?

UNABLE TO FIND PEOPLE _____

NOT ENOUGH MONEY _____

WHO HELPED YOU WHILE YOUR HUSBAND/BOYFRIEND/FATHER/BROTHER/FRIEND HAS BEEN AWAY?

DISTRICT REGION MIGRANT/FARMER'S NAME

DO YOU SELL FOR ANYONE?

WHAT DO YOU SELL? _____ HOW OFTEN? _____ CHARGE? _____

WHAT KIND OF TRANSPORTATION DO YOU TAKE TO THE MARKET? cost?

SEAFORTH _____

MORANT BAY _____

KINGSTON _____

DO YOU PAY A PUSH CART MAN WHEN YOU GET TO THE MARKET?

every time _____/wk. _____/mo., sometimes _____ how much/
 time _____

DO YOU EAT WHILE AT THE MARKET? YES/NO WHAT?

DO YOU BUY AT THE MARKET? WHAT? PRICE?

INTERVIEW SCHEDULE 2

Name:
 District:
 Date:

SOCIO-ECONOMIC INDICATOR: HOUSE CONDITION

- 1 Wall of house (a) made of wood-old/new
 - (b) cement
 - (c) nug (wattle daub)
- 2 Roof (a) made of wood-holes yes/no
 - (b) cement
 - (c) tile-old/new
- 3 Floor (a) made of wood-holes yes/no
 - (b) cement
 - (c) tile-old/new
- 4 Verandah yes/no
old/new
- 5 House by main road/back road
- 6 Window glass/wood
glass-panes/shutters
wood-plain/shutters
- 7 Door wood-new/old
painted - yes/no
plain/panelled
- 8 Number of rooms in house : 1 2 3 4 more than 4
- 9 House has doors for all rooms yes/no
Doors painted yes/no
- 10 How many rooms have doors? _____
- 11 Inside house painted yes/nor

- 12 How many rooms inside house painted? _____
- 13 Does house have bathroom/toilet? inside/outside
- 14 Does house have kitchen inside/outside
- 15 Material used to make kitchen wood-painted yes/no
 cement-painted yes/no
 thatch yes/no
- 16 Material used to make bathroom/toilet yes/no
 wood-painted yes/no
 cement painted yes/no
- 17 Ceiling has holes yes/no
- 18 Electricity yes/no
- 19 carport/gargage yes/no
- 20 Gate: painted yes/no
 Iron-grill yes/no
 Wood yes/no
 barbed wire fence yes/no
 zinc fence yes/no
 shrubbery yes/no
- 21 Garden yes/no