

## ABSTRACT

Title of Dissertation: ANALYZING THE IMPACT OF PARTICIPATORY  
PLANNED CONSERVATION POLICIES IN THE  
NEGRIL ENVIRONMENTAL PROTECTION AREA,  
WESTERN JAMAICA

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This dissertation research sought to determine the ways in which the participatory-planned conservation policies influence changes in local populations' natural resource use. The research took place in the Negril Environmental Protection Area, western Jamaica and covered the period 1990 to 2005. The two major questions asked were 1) In what ways do participatory-planned conservation policies influence changes in the protected area's natural resource use? 2) How does group membership and demography influence the perception of the conservation policies and of changes in natural resource use? The research employed trend analyses, content analyses, a population survey, discriminant analyses and semi-structured interviews to answer the research questions.

In general, the research finds that national socioeconomic development interests were given priority over the participatory-planned conservation policies. The changes in local populations' natural resource use were primarily due to the national socioeconomic policies that were in place prior to the protected area designation as well as those that were implemented during the study period. Second, the research finds that, in general, groups that have shared histories were homogeneous in their views of conservation

and/or development. In contrast, newer entrants to the protected area were generally heterogeneous in their views of conservation and/or development. Further, the research finds that changes in the demographic characteristics of local populations significantly influence the perception of conservation and development. For example, respondents who were relatively new to the protected area generally had a positive perception of conservation and of the decline in fishing jobs. In contrast, respondents who have lived there relatively longer had a negative perception of conservation and of the decline in fishing jobs.

By examining the complexity of implementing the participatory-planned conservation policies in Negril's postcolonial and non-colonial socioeconomic and political landscape, this research extends the discourse on protected areas from large, relatively low populated areas to the complex geographic landscapes that currently describe some newer protected areas.

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CONSERVATION POLICIES IN  
THE NEGRIL ENVIRONMENTAL PROTECTION AREA, WESTERN, JAMAICA

by

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## CHAPTER 1 INTRODUCTION

In developing countries, protected areas are centers of emergent conflicts over land use change.<sup>1</sup> Critics observe that the designation of these areas has resulted in changes in local populations' use of natural resources in Africa (Schimdt-Soltau 2003), Asia (Seeland 2000), and Latin America (Slater 2004). Of note, they find that regardless of their stated purpose, in general, protected areas are primarily for maintaining biodiversity, and not for facilitating the market-oriented socioeconomic development that often takes place (Slater 2004, Seeland 2000).<sup>2</sup> Geisler (2003) finds that this dichotomy rests in a conservation policy framework that is still infused with ideas of protected areas as 'fragile' and 'sublime,' and thus incapable of withstanding particular uses. Protected areas, then, are battlegrounds for conservation and development proponents. Yet, their relatively recent phenomenal growth suggests otherwise (see Figure 1).

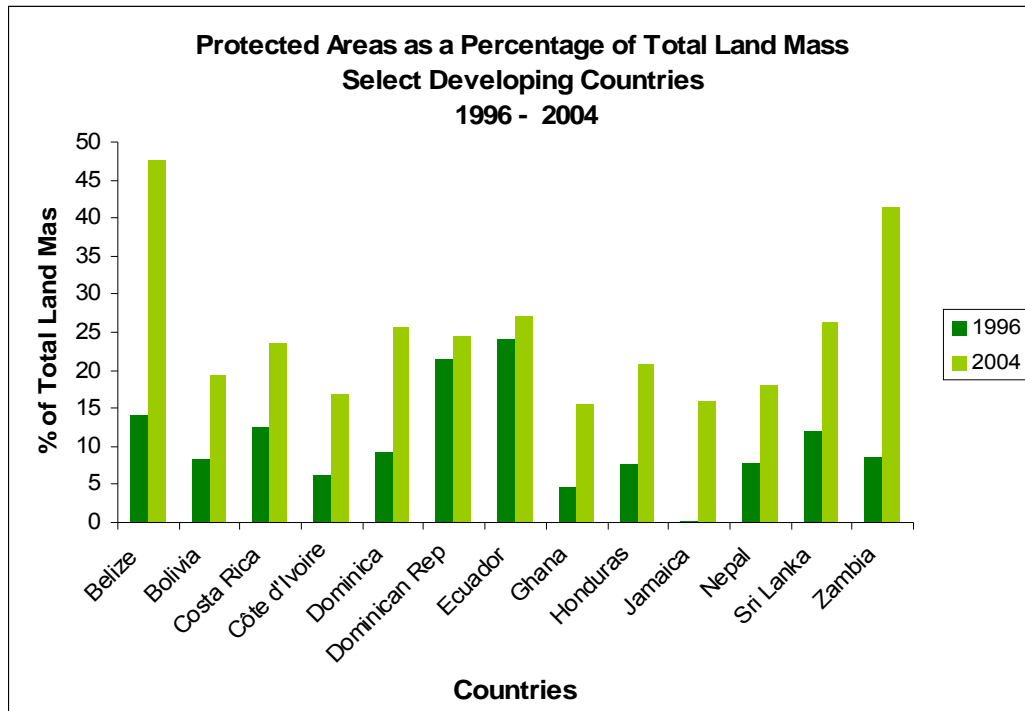
Two parallel international policy environments have facilitated this growth. The first moves developing countries' protected areas into the global conservation management arena with the enactment of international treaties such as the Convention on Biodiversity (1992). The second pairs developing countries' economic development with the designation of protected areas. Thus, aid and debt agreements such as those proposed by the United States Agency for International Development and the World Bank are replete with conditions that some critics call the 'greening' of developing countries economic

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<sup>1</sup> The International Union for the Conservation of Nature (IUCN) (also known as the World Conservation Union) (1992) defines a protected area as "an area of land and/or water that is managed for the protection and maintenance of its ecological systems, its biodiversity, and its specific natural, cultural and/or aesthetic resources."

<sup>2</sup>Also, see Johnston (1994).

Figure 1.1.



Source:  
<http://www.earthtrends.wri.org>.

Notes:

2004 data: <http://www.earthtrends.wri.org>. Data Courtesy of United Nations Environment Programme - World Conservation Monitoring Centre (UNEP-WCMC). 2004. World Database on Protected Areas (WDPA). CD-ROM. Available on-line at: <http://sea.unep-wcmc.org/wdbpa/download/wdpa2004/index.html>. Cambridge, U.K. Accessed 16 September, 2006.  
1996 data: <http://www.earthtrends.wri.org>. United Nations Environment Programme - World Conservation Monitoring Centre (UNEP-WCMC). World Database on Protected Areas (WDPA) Version 6. Compiled by the World Database on Protected Areas Consortium. Cambridge, U.K., August, 2003. Accessed 24 April, 2004.

development (see Dobson 2001, Zimmerer 2000). However, proponents draft international conservation and development policies quite broadly (for example, see the Convention on Biodiversity). The emergent conflicts in developing countries' protected areas, then, may have little to do with broadly conceptualized conservation and development policies, but rather developing countries' interpretation and implementation of these policies.



Far from being homogenous entities, developing countries are highly heterogeneous with different goals favoring different interests.<sup>3</sup> Thus, on initiating changes in natural resource use, are developing countries responding primarily to global conservation goals or to national social issues such as poverty and population growth? How do they reconcile the competing need for conservation with changes in their protected areas' demographic structure, and the resulting increase in the demand for natural resource use? The challenges of balancing their responses to such issues typify developing countries' policy process, and are thus likely to influence changes in protected areas' natural resource use.

#### THE STATEMENT OF RESEARCH

This dissertation uses systems theory to determine the ways in which *participatory-planned conservation policies* influence changes in the use of protected areas' natural resources. The *participatory-planning* of protected areas' management policies is one in which stakeholders' identify the geographic areas to be protected and contribute to the development of related policies (Convention on Biological Diversity 2006). This research takes place in the Negril Environmental Protection Area, western Jamaica.<sup>4</sup> Negril is particularly suited for the research since it embodies the complexities of balancing conservation and development projects within protected areas that are replete with colonial and non-colonial influenced cultural, political and socioeconomic systems.

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<sup>3</sup> Anderson (2002) and Kingdon (2002) note that interest groups continuously work to influence policies from inception to implementation. Further, they note that these groups maintain their roles in the follow up stage of policymaking to retain or increase their influence in the next round. Also, see Birkland (2005) and Legro (2000).

<sup>4</sup> Hereafter, the Negril Environmental Protection Area is interchangeably called Negril or the protected area.

### Research Question 1

From 1995 to 2005, in what ways did the participatory-planned conservation policies influence changes in Negril's fishing, sugar and tourism groups' natural resource use?

### Research Question 2

How does group membership and demography influence the perception of the conservation policies and of changes in each group's natural resource use?

Though Negril's geographic landscape is unique, the results from this research are significant to other protected areas in Jamaica that are now earmarked for various development projects.<sup>5</sup> Further, this research is of significance to other developing countries' whose protected areas were of colonial economic importance. To understand the impact of this socioeconomic foundation, one only has to examine briefly Negril's cultural, political and socioeconomic histories as conditioned by the fishing, sugar and tourism industries.

#### THE NEGRIL ENVIRONMENTAL PROTECTION AREA, WESTERN JAMAICA

As an integral part of Jamaica's implemented *System of Protected Areas*, the national government designated Negril a protected area in 1995 with the primary goal of managing the cultural and natural resources within its geographic boundary (Table 1, Figure 2).<sup>6</sup> Central to this project is the more than 100,000 acres that encompass the Negril and Green Island watersheds in western Jamaica. Thus, the protected area is home

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<sup>5</sup> This research is particularly useful to the *South Coast Development Plan* (Urban Development Corporation 2004).

<sup>6</sup> The *National Resource Conservation Act (NRCA) (1991)* underpins Jamaica's *System of Protected Areas*. This Act grants the National Environment and Planning Agency, and its representative agencies, the power to identify, designate and manage Jamaica's protected areas through community/stakeholder meetings and policy drafting sessions.

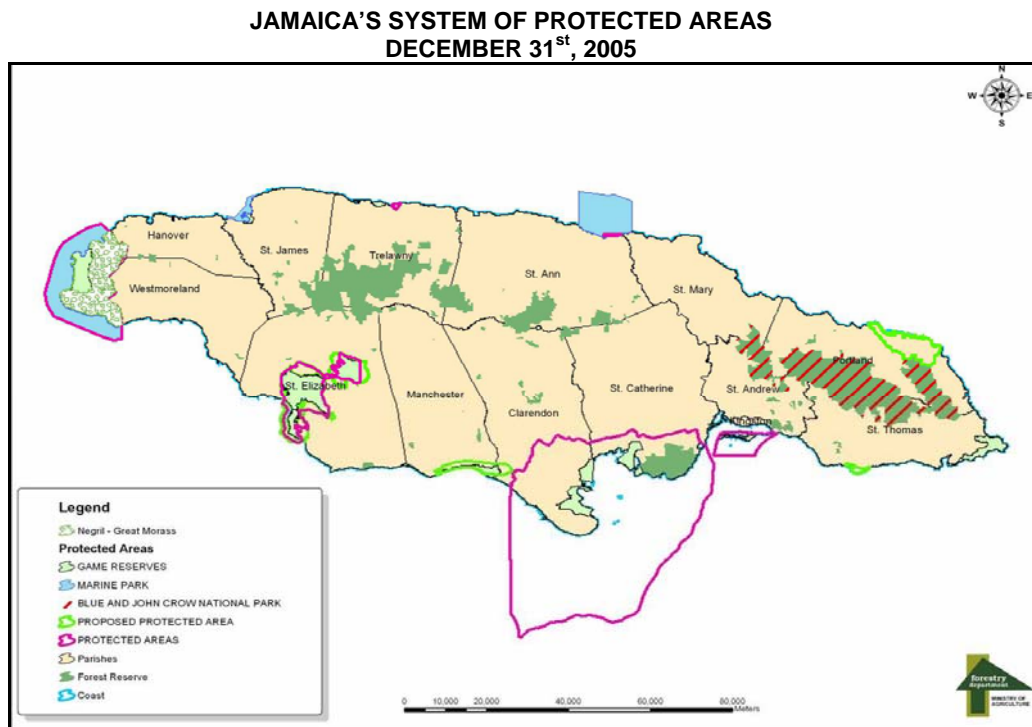
**Table 1.1**

JAMAICA'S SYSTEM OF PROTECTED AREAS DECEMBER 31 <sup>ST</sup> , 2005			
NAME	LOCATION PARISH	HECTARES	
		LAND	MARINE
Blue & John Crow Mountains	St. Mary, St. Andrew, Portland, St. Thomas	49,500	
Coral & Mountain Springs	Manchester, Clarendon	170	
Montego Bay	St. James		1,400
<b>Negril</b>	<b>Hanover, Westmoreland</b>	<b>40,700</b>	<b>18,500</b>
Ocho Rios	St. Ann		13,300
Palisades-Port Royal	St. Andrew	800	6,000
Portland Bight	Clarendon, St. Catherine	55,000	142,300
<b>TOTAL</b>		<b>146,169</b>	<b>181,500</b>
Percent of Total Land Area		15.1	

Source: The Government of Jamaica (GOJ) (1997a, 2005c).

Note: Jamaica's total land area is 968,013 hectares.

**Figure 1.2**



Courtesy of the Ministry of Agriculture, Forestry Division, August 2005.

to about thirty thousand residents, numerous small mixed farms, sugar cane farms, subsistence fishing villages, tourism development and hectares of dry and wet forests and tropical savannas (Commonwealth Secretariat 2000, Rural Agricultural Development Agency 2004, Sugar Industry Research Institute 2005, Statistical Institute of Jamaica 2005a). Yet, the issues that drive changes in the protected area's natural resource use are even more complex than these images imply. Indeed, if one spends sufficient time in the protection area, one realizes that Negril is not only the nexus of starkly contrasting rural and urban lifestyles, but also a tightly negotiated national political arena.

To illustrate, when one speaks locally of Negril, one hears about its seven miles of white sandy beaches, sun tanning mavens, long lazy sunsets, and a nightlife that could leave one speechless. Tourism is Negril's public persona. Yet, it is the sugar industry that dominates Negril's land use. In fact, for more than 200 years, the sugar industry has controlled more than two thirds of the now protected area's arable lands (see Sheridan 2000, The Statistical Institute of Jamaica 1996, West Indies Sugar Company 1793). Thus, for more than 200 years, this large-scale colonial transformation of Negril's arable lands to sugar cane estates has solidified the protection area's landownership structure and tenure.<sup>7</sup> With this historical foundation, the sugar industry has not only influenced the

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<sup>7</sup> For historical production, export and tariff data, see the Public Records Office, London England [Quit Rent Books for 1771 - 1953]. The Quit Rent Books include a list of landholders in the island of Jamaica for stated years together with the number of acres held by each person. These documents are probably the most extensive records on Jamaica's (and indeed the British Caribbean's) colonial sugar farming, production and trade. For the continuation of the landownership structure after 1953, see the Hanover and Westmoreland Parish Councils' Property Tax Records. These records predate Jamaica's political independence from Great Britain. For detailed farming records, see the [British] West Indies Sugar Company's operations at the Jamaica Public Records Office, Spanish Town, Saint Catherine, Jamaica. These records are part of the *Inventory* series that began in 1674.

cultural and socioeconomic development of local communities, but also it has had far reaching impact on national politics, and Jamaica's international presence.<sup>8</sup>

Now, in contrast to the sugar industry, Negril's tourism industry began inauspiciously. In the late 1960s, Negril's tourism industry began with less than two hundred annual visitors who either 'boarded' with fisher families or camped on its beaches (Jackson 1974). However, like sugar, by the end of the 1980s, the tourism industry was similarly influential in Negril's socioeconomic structure (Taylor 1991).

To illustrate, beginning in the early 1970s, Negril's socioeconomic structure changed drastically as Jamaica implemented the International Monetary Fund's Structural Adjustment Policies. As a condition of Jamaica receiving international aid, the International Monetary Fund stipulated that Jamaica allow foreign investors to buy or lease beachfront properties to develop tourism and reduce its dependence on sugar exports (Iqbal 1993).<sup>9</sup> Negril, representing Jamaica's most extensive set of beaches, became the launching ground for the restructuring of Jamaica's economic dependence from sugar to tourism.<sup>10</sup> With national and international support, by 1974, the government transformed much of Negril's coastal wet forest and creeks into a booming town with the necessary infrastructure to support a tourism industry (Jackson 1974). Negril's tourism industry now dominates its seven miles of beaches, and boasts all-

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<sup>8</sup> For example, in the 1930s, labor disputes at the Frome Sugar Factory fueled the growth of the Jamaican trade union movement. These disputes also triggered the emergence of the existing national two-party political system whose founders later negotiated Jamaica's independence from Great Britain (Nurse 1992).

<sup>9</sup> Although, Jamaica no longer borrows from the International Monetary Fund, the repayment of past loans still underpins Jamaica's annual fiscal policies (see Davis 2005), and by extension, the success of Negril's tourism.

<sup>10</sup> Thus, the national government authorized the Urban Development Corporation, a *quasi* government agency, to buy or *assume* control of Negril's wet forest and other coastal areas, and to sell or lease portions thereof to foreign investors (Urban Development Corporation and Design Collaborative 1974, 1982). The Urban Development Corporation is currently one of the largest landholder in the protected area. Its lands include primarily coastal wet forests and beachfront property (Commonwealth Secretariat 2000).

inclusive hotels with four and five star ratings (Jamaica Tourist Board 2005). However, the reconstruction of Negril's coastline simultaneously changed the local fishing population's beach access.

Like sugar, fishing has existed in the protection area for more than 200 years (West Indies Sugar Company of Jamaica 1793). However, unlike sugar's dominance of the protected area's interior, fishing remained at the western periphery of Negril's wet forests (West Indies Sugar Company of Jamaica 1793). Historically, fisher families traded with other local population centers by way of the Caribbean Sea (Urban Development Corporation and Design Collaborative 1974). The fishing industry has supplied the local *residential* population with seafood, and provided employment for canoe and fish pot artisans (Urban Development Corporation and Design Collaborative 1974, 1982). Indeed, while sugar and tourism has enjoyed local, regional, national and international recognition, the fishing industry has remained local.

Sugar and tourism are among the top three foreign exchange earners for Jamaica (World Bank 2004, Statistical Institute of Jamaica 2005a).<sup>11</sup> With Jamaica's average annual foreign debt payment often exceeding fourteen percent of its Gross Domestic Product (GDP) (World Bank 2004), the successful economic operations of these two industries within the protected area is likely to be of national importance.<sup>12</sup> However, scientists note that all three industries are significant contributors to the deterioration of Negril's physical environment (Goreau and Goreau 1996). Thus, for each, participatory-developed industry specific conservation policies are in effect on Negril's designation as a protection area.

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<sup>11</sup> The bauxite industry is the third (The Statistical Institute of Jamaica 2005a).

<sup>12</sup> In 2004, Jamaica's foreign debt exceeded U.S. \$5.4 billion (World Bank 2004).

Yet, with such varied histories, and dissimilar power base, to what extent could the participatory-planned policies influence changes in each industry's natural resource use? What is each group's perception of these changes? How does demography or family landownership influence these perceptions? These questions underpin this dissertation research.

Thus, including the introduction, this dissertation consists of seven chapters. While chapter one briefly examines the need for the research, chapter two reviews some of the social science critique of protected areas. Chapter two begins with an examination of the applicability of open systems theory to social science research in protected areas. This section also examines geographer Piers Blaikie's work in the use of open systems theory to analyze human-environment problems in developing countries' geographic landscapes. The chapter continues with a review of the social science critique of protected areas as *non-humanized* and *humanized* spaces. While the review of *protected areas as non-humanized spaces* sets the framework for the development of the second, it is within the second that the research in the Negril Environmental Protection Area lies.

Next, chapter three reintroduces the Negril Environmental Protection Area. The chapter focuses primarily on Negril's physiography, land use and key demographic characteristics since an understanding of each outlines the human and physical conditions that exist prior to the protected area designation.

Chapter four reviews the research questions, and the data and methodologies that are used to answer each. The chapter includes an examination of the importance of applying multiple temporal and spatial scales to the research. It concludes with a summary of how the primary research question will be answered.

Next, chapter five answers the first research question by using trend and content analyses to show the ways in which industry-specific conservation policies influenced the fishing, sugar and tourism groups' select operating ratios from 1995 to 2005. Chapter five concludes with a summary of the findings.

Next, chapter six answers the second research question on the fishing, sugar and tourism populations' perception of conservation and of changes in each group's available jobs. The chapter includes the use of *forward* Stepwise Discriminant Analysis to test the significance of age, gender, years of residency, family landownership, education level or average monthly income in influencing the within and among *a priori* fishing, sugar and tourism groups' perception of these changes. The chapter concludes with a summary of the findings.

Finally, chapter seven presents the findings of the dissertation as well as highlights the major issues that require further research.



## CHAPTER 2 THE LITERATURE REVIEW

This chapter reviews some of the social science critique of protected areas. The chapter begins with a review of systems theory, its use in past geographic works and its significance to the research in Negril. This review of systems theory includes an examination of geographer Piers Blaikie's seminal contribution to geographic research in human-environment systems. In geography, much of the discussion and critiques of systems theory occurred during the quantitative revolution. There has been very little critique since then, and systems theory now underpins most geographic work.

Next, this chapter examines the two major themes that have dominated the social science critique of protected areas. The first, 'protected areas as non-humanized spaces,' is further examined in terms of its principal accompanying conditions, *the lack of legal title: 'no man's land' and the vagaries of 'substitute' lands*. The second, 'protected areas as humanized spaces,' is further examined in terms of its influence on *the increased differentiation between social classes* and its reliance on *the homogeneity of local communities*. This latter sub-section also reviews the Millennium Ecosystem Assessment (2000) and its goal of using scientific research to formulate better human-environment policies and to identify interference points for alleviating potential crises. The chapter concludes with some questions that emerge from the literature review.

### SYSTEMS THEORY

In his seminal work, *General systems theory: Foundations, development, applications*, biologist Ludwig von Bertalanffy (1968 [1923]) asserts that a system is characterized by the interaction of its parts, and the nonlinearity of those interactions. Systems theory, then, is one in which no variable within the system or subsystem is

assessed in terms of itself but rather by how it shapes and is shaped by processes that may be internal or external to the observed system (Huggett 1980). Essentially, systems theory provides a general theoretical framework for analyzing relationships within a bounded set of variables. Rodin, Michaelson, and Britan (1978) add that systems theory provides a ‘metalanguage’ that allows various disciplines, and sub-disciplines in the social and physical sciences to ‘speak’ the same language. These characteristics make systems theory essential to geographic research.

Harlan Barrows (1923) recognize the benefits of applying systems theory to geographic research in his 1923 Presidential address to the American Association of Geographers (AAG).<sup>13</sup> In this inaugural address, *Geography as Human Ecology*, Barrows (1923) propose that future geographic research use a theoretical framework that emphasizes human systems. Early systems-based geographic works include Richard Chorley’s (1962) *Geomorphology and general systems theory*, F. Raymond Fosberg’s (1963) “The island ecosystem,” and Peter Haggett’s (1965) *Locational analysis in human geography*.<sup>14</sup> Chisolm (1967), and later, Rodin, Michaelson, and Britan (1978) critique the use of systems theory as limiting the scope of geographic research since it implicitly negate the informal relationships that transcend formal boundaries.<sup>15</sup> Thus, they find that these early works imply that human-environment interactions consist of variables that

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<sup>13</sup> Sociologists Robert Park and Ernest Burgess from the Chicago School of Urban Ecology were already using systems theory to analyze urban patterns of succession, and the spatial organization of ethnic and socioeconomic groups in Chicago’s neighborhoods (see Park and Burgess 1921; Park, Burgess, and McKenzie 1925). Their employment of systems theory led to such concepts as the *concentric zone theory of urban land use*. Works that build on Park and Burgess’ work include Bulmer (1984), and M. Davis (1998). Other early social science research that use systems theory include anthropologist Clifford Geertz’s (1966) integration of cultural, political and economic factors in his research on land use change in Java, Indonesia.

<sup>14</sup> Another early significant geographic work is Ian Burton, Robert W. Kates, and Gilbert F. White’s (1993), *The environment as hazard*.

<sup>15</sup> These critiques were also levied at anthropologist Roy Rappaport’s (1968), *Pig for the Ancestors: Ritual of the ecology of a New Guinea people*.

operate to maintain equilibrium through limited random variation (homeostatic equilibrium) or regular fluctuations (dynamic equilibrium).<sup>16</sup> Rodin, Michaelson, and Britan (1978) observe that it is from these works that environmental traits such as *niche*, *adaptation*, *carrying capacity*, *succession*, and *trophic levels* incorrectly became environmental tenets.

However, Stoddart (1967) observes that since human-environment systems share the structural characteristics of ecosystems, the use of systems theory is beneficial to research in human geography. If human-environment research is similar to ecosystems, then, one can simultaneously analyze the interactions between humans, animals, and plants at various temporal and spatial scales (see Stoddart 1965, 1967). Thus, essentially, the strength of systems theory lies in its flexibility. Systems theory allows one to conceptualize not only research that consist of the static structures and variables of *closed* systems, but also the dynamics of evolving structures that are inherent in *open* systems.

#### Open Systems Theory in Human-Environment Research

Open systems allow one to examine, at multiple temporal and spatial scales, the complex interrelationships among variables that underpin human-environment research. In human geography, probably the most influential use of open systems in human-environment research is that of Piers Blaikie.<sup>17</sup> In his seminal work, *The political economy of soil erosion in developing countries*, Blaikie's (1985) research in Nepal

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<sup>16</sup> Also, see Vayda and McKay (1975). See Zimmerer (1996, 2000) for two recent critiques of this view.

<sup>17</sup> Professor Piers Blaikie retired from the School of Development Studies, University of East Anglia, England in 2003 after thirty-one years. During this period he has served as member of the editorial board for the journals, *Progress in Development Studies* (2000 – Present), *Development and Change* (1995 – Present) and *Economic Geography* (1992 – 1995). During his career, he has directed funded research exceeding £1.5M on behalf of the Department for International Development, UK and the Overseas Development Agency (British government agencies). Although he is retired, Blaikie continues to teach and conduct research as Professor Fellow at the School of Development Studies, University of East Anglia.

shows how various subsystems interact at multiple temporal and spatial scales to exacerbate soil erosion. The central theme of this work is that in some developing countries, the stage is often set for soil erosion in colonial, socioeconomic and political systems. Blaikie (1985) finds that colonial regimes' exiling of native populations to marginal lands and their requiring native populations to grow cash crops are two of the principal social causes for soil erosion in developing countries.<sup>18</sup> This early approach to human-environment research differs from earlier works that focused on household systems as the primary cause of environmental problems (for example, see Grossman 1981 and Collins 1986). Social science researchers have applied Blaikie's open systems human-environment analytical approach in diverse regions, such as Kenya and Bolivia, and to diverse subjects that influence land use change, such as capital markets and labor (for example, see Rocheleau, et al. 1995 and Zimmerer 1993).

Blaikie's recent works have focused primarily on the improvement of conservation and development policies (see Blaikie 2001; Blaikie, Cameron and Seddon 2002; and Blaikie and Muldavin 2004). Thus, much of his current work involves the World Bank and other international agencies that are concerned with the development of human-environment policies. In one of his most recent works in the Himalayas, Blaikie and Muldavin (2004) use open systems theory to analyze the complex, fluctuating, multi-scaled relationships that they encounter in that policy environment. They find that nonlinear, discontinuous, and often fluctuating systems influence human-environment interactions. Specifically, history, culture, politics, demography and the limitations of

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<sup>18</sup> Blaikie's other early works that mirrored this approach include "Changing Environment or Changing Views" (1995) and (with H. Brookfield), *Land degradation in society* (1987).

physical environment significantly influence the availability and use of natural resources (Blaikie and Muldavin (2004).

Current research that continue to build on Blaikie's work includes Susan Hecht, et al. (2006) analysis of the many views of forest resurgence and its implications in El Salvador; Lemos and de Oliveira's (2004) analysis of the politics of water rights in Ceara, Northeast Brazil; de Castro and McGrath's (2003) work on floodplain lake fisheries in the Brazilian Amazon; and Turner and Williams (2002) on livestock vulnerability in the Sahel. It should be clear, then, that open systems theory is applicable to this research in the Negril Environmental Protection Area since it allows one to examine the ways in which participatory-developed conservation policies influence changes in the protected area's natural resource use.

#### THE SOCIAL SCIENCE CRITIQUE OF PROTECTED AREAS

In the past thirty years, much of the social science critique of developing countries' protected areas has focused on their seemingly implicit alternate definitions as *non-humanized* and *humanized* spaces. In general, protected areas are critiqued as neocolonial instruments in the redefining and restructuring of developing countries' environments (see Dobson 2001, Slater 2004, Zerner 2000). At the root of this critique is the continued seemingly acceptable change in local population's natural resource use (see Cernea 1997, Slater 2004). In *Refugees, environment, and development*, Black (1998) notes that this change is neither recent, nor is it unique to specific developing regions. Rather, it has been common in Africa, Asia and Latin America not only during the colonial era, but

also after it had ended (Black 1998).<sup>19</sup> Of significance, this change is common to protected areas that are implicitly defined as *non-humanized spaces*.

### Protected Areas as Non-Humanized Spaces

The separation of humans from ‘nature’ marks, quite possibly, the most combative period in developing countries’ protected areas’ history. This traditional conservation philosophy lies in Darwinian views of a balanced nature (see Glacken 1972), and underpins the early protected areas established by international non-governmental conservation organizations and/or colonial governments in **Africa** (see Gordon 2000, Neumann 1996), **Asia** (Ghimire 1994, Rawat 1997, and Seeland 2000), and **Latin America** (Albert 1994, de Oliveira 2002, Boza 1993).

Critics observe that these protected areas are infused with ideas, forms and images of ‘nature’ as fragile, and thus incapable of withstanding human populations (see Geisler 2003, Katz 1999, McHenry 1998).<sup>20</sup> They note that these perceptions have not only been used to legalize the separation of humans from plant and animals in some developing countries’ protected areas (see Eden 2001a, 2001b; Ferraro 2001, Geisler 2003), but also they underpin the extent to which development is allowed to occur (see Slater 2004 and Gordon 2000).<sup>21</sup> Development beyond prescribed limits is said to eliminate the ‘naturalness’ of native peoples, and render them ineligible occupants of protected areas

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<sup>19</sup>The displacement of peoples from protected areas is well documented. For Africa, see Cernea (1997, 2003), Geisler (2003), Ghimire (1994), Gordon (2000), Hitchcock (1995), Neumann (1995), Robbins (1998), Schmidt-Soltau (2003), Schroeder (1997), Turnbull (1987), Turner (1999), Wells (1996). For Asia, see Ghimire (1994), Peluso (1993), Rawat (1997), and Seeland (2000). For Latin America, see Albert (1994), de Oliveira (2002), and Stonich (1998).

<sup>20</sup> Also, see Geisler (2003), Harrison, Burgess, and Clarke (1998), Neumann (1995, 1997) and Said (1994).

<sup>21</sup> Also, see Cronon (1996), Glacken (1972), Gordon (2000), MacNaughten and Urry (1998), McAfee (1999), McHenry (1998), Neumann (1995, 1996, 1997), Proctor (1998), Robbins (1998), Scoones (1999), Stearman (1994), and Young (1999b).

(see Slater 2004).<sup>22</sup> Thus, these perceptions of ‘nature’ are critiqued as limiting to native peoples’ socioeconomic development (see Moworth and Munt 2003 and Slater 2004).<sup>23</sup>

Issues such as social justice, race and class are sub-themes of these works (see Dobson 2001, Slater 2004, and Zerner 2000).<sup>24</sup> Essentially, these works ask, whose reality of ‘nature’ counts, and for whom should it be conserved? De Oliveira (2002) observes that the conservation of plants and animals at the expense of protected areas’ peoples is primarily associated with native peoples’ lack of legal title to particular natural resources and the idea that alternative spaces will satisfy their needs.

#### The Lack of Legal Title: ‘No Man’s Land’

Developing countries’ governments have used native peoples’ lack of legal title or tenure to deny them access to natural resources (see Hitchcock 1995, de Oliveira 2002, Stonich 1998). Yet, contrary to Western societies, for many populations, natural resources such as fish and water are common property, and thus legal title or tenure is irrelevant to their use of these resources (see Ostrom, et al. 1999, Bloch 1993). This emphasis on legal title or tenure has been used to disenfranchise **hunter/gatherer** peoples (see Gordon 2000, Hitchcock 1995, and Katz 1999), **pastoralists** (see Neumann 1995, and Turner 1999), and **subsistence fishermen** (see Stonich 1998, and Young 1999a). A common theme that underpins these changes in subsistence livelihoods is the idea that these activities degrade the environment (see Gordon 2000, Katz 1999, Neumann 1995). Critics argue the validity of these claims since these areas were only

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<sup>22</sup> Also, see Stearman (1994).

<sup>23</sup> Also, see Stearman (1994), Neumann (1995), Robbins (1998), and Turner (1999).

<sup>24</sup> Also, see Gordon (2000), Moworth and Munt (2003), Said (1994), and Slater (1994, 2000).

available to native peoples because of their marginality (see Biot et al. 1995, and Blaikie 1995).

De Oliveira (2002) finds that as developing countries' resist addressing the inequitable distribution of land, they have responded to the call for global biodiversity conservation by reclassifying these once 'marginal' lands as void of humans, and thus, available for conservation.<sup>25</sup> Thus, on a protected area's designation, these populations have limited or no access to the natural resources they once used. Further, the compensatory approaches and substitute lands that are sometimes offered in return have not mitigated the impact of these changes (see Bloch 1993, Geisler 2003).

#### The Vagaries of 'Substitute' Lands

Early research on the Ik peoples of Uganda (Turnbull 1987), the Ojibway of Canada (Shkilynk 1985), the Tyua of the Northern Kalahari (Hitchcock 1995), and the Yanomami of Brazil (Albert 1994) document the loss of culture as traditional practices are either banned in 'substitute' lands or are not conducive in these areas. Geographer Tom Hitchcock (1995) observes that these changes are pronounced when displaced peoples become refugees in foreign territories since they are often forced to disband and live 'other lives' as they compete with other native peoples for natural resources. Other critics observe that these issues are usually not factored into protected areas policies, and when they are, the responses have consisted of compensatory measures such as cash payments, free medical services and/or surplus agricultural products (see Ferraro 2001,

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<sup>25</sup> The inequitable distribution of land dates back to colonialism for some developing countries while for others it is part of the transition from colonialism to an independent economy, and the rise of native ruling classes. [For further discussion on the inequitable distribution of land in developing countries, see Bassett 1993, Bassett and Zuéli 2000, Biot et al. 1995, Bolland 1996, Bryan 2000, and Mintz 1996]. Also see Cronon (1995), Glacken (1972, 1973), Slater (1994), Whatmore and Thorne (1998) on the meanings of wilderness from the beginning of civilization to now.



Seeland 2000, Shkilynk 1985). As observed among the Ojibway tribe (Shkilynk 1985), and Nepalese farmers (Seeland 2000), these compensatory approaches erode culture, and undermine self-sufficiency and self-determination (Geisler 2003).<sup>26</sup>

In summary, the use of Western concepts of ‘nature’ to define developing countries’ protected areas has triggered significant changes in local populations’ natural resource use. The substitution of other natural resources or the compensatory approaches that some national governments have applied underestimates the significance of particular environments for local populations. The recognition of these limitations and local populations’ sometimes violent responses to these changes underpin the current rethinking of protected areas, and the latest shift in how they are conceptualized (see Schroeder 1997).

#### Protected Areas as Humanized Spaces

The idea that developing countries’ governments and peoples have the inalienable right to designate and manage their protected areas emerged in the 1960s (Stearman 1994), but was not internationally ‘recognized’ until the 1992 signing of the *Convention on Biological Diversity*.<sup>27</sup> International trade agreements, and political and economic side agreements between developed and developing countries now include set aside protected areas’ quotas and/or resource use regulation and restrictions with general outlines of how

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<sup>26</sup> This compensatory approach is also used in Costa Rica (Boza 1993, Boza, Jukofsky, and Willie 1995) and China’s Woolong Reserve (Liu et al. 1999).

<sup>27</sup> As signatories to the Convention on Biodiversity, developing countries can designate protected areas with classifications for use that ranged from areas that are marked *Strictly for Research* (Category 1) to *Multiuise Areas* (Category 6) (Convention on Biological Diversity 1992). See the IUCN’s list at <http://www.biodiv.org>. In the spirit of the agreement, developing countries agreed to use safeguards such as Environmental Assessments (EA) before developing any portion of their environment (Convention on Biological Diversity 1992). With such safeguards, it is understood that developing countries are free to develop any portion of their environment that is not designated a Category 1 for their economic development. Such development, then, is expected to be beneficial not only to national development goals but also, to local populations and the physical environment (Convention on Biological Diversity 1992).

these areas can be used to achieve economic development (Biot et al. 1995, Zimmerer 2000).<sup>28</sup> However, while the *Convention on Biodiversity* proposes ‘nature’ friendly economic development, such as ecotourism, medicinal plant harvesting (Gobi 2000, Posey 1996), and agroforestry (Boffa 1999; Richards 1996) as the preferred forms of economic development, international development groups often advocate the expansion of tourism in these areas (see Brohman 1996, Moworth and Munt 2003).

Seeland (2000) observes that, in general, the humanizing of developing countries’ protected areas often results in the transformation of those areas into foreign investment havens. To be specific, developing countries that have coastal areas conducive to traditional tourism development (see Bolles 2002, United States Trade Representative 2000) as well as those that have ‘exotic’ animals (see Ghimire 1994, Seeland 2000) are encouraged to develop tourism industries that are open to foreign investors. Thus, international development agencies such as the International Monetary Fund (IMF), the World Bank, the Inter-American Development Bank (IDB), and the United States Agency for International Development (USAID) are criticized for having played key roles in the humanizing of protected areas for the expansion of tourism (de Oliveira 2002). These entities’ roles are evident in economic development agreements, such as the *Declaration of Montelimar* and the *Caribbean Basin Initiative*, two United States aid/economic development plans that currently guide the United States’ investment

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<sup>28</sup> Groups include the European Union (EU), and agreements include the Free Trade Area Agreement (FTAA). Note that projects often require the clear cutting of forests (see Albert 1994 and Stonich 1998) and thus, changes in other natural resource uses (see Falkowski, et al. 2000, Mannion 1998).

policy in Central America and the Caribbean (see Stonich 1998, United States Trade Representative 2000).<sup>29</sup>

With international support, Geisler (2003) notes that developing countries' governments have routinely used the mantra of protected areas to gain access and control of particular geographic spaces that are earmarked later as significant avenues for local, regional and national economic growth.<sup>30</sup> This 'bait and switch' technique has been used repeatedly to further the development of tourism in protected areas (de Oliveira 2002, Lemos and de Oliveira 2004).<sup>31</sup>

Thus, this second body of literature analyzes the ease with which large-scale commercial developers operate within protected areas even as subsistence livelihoods are restricted or banned (see Stonich 1998).<sup>32</sup> These works are grounded in the concepts of agency and agency in nature (see Glacken 1972, Sauer 1967). They ask, does nature exist simply to satisfy humans' needs or are human-nature relationships symbiotic? The significant wealth differentiation among groups is criticized as an early problem with this latter concept of protected areas. The other is the implicit belief that 'communities' are homogenous and thus, the local populations' views on conservation and development projects are similar.

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<sup>29</sup> See Stonich's (1998) examination of Honduras' interpretation of the *Declaration of Montelimar*, and Honduras' restructuring of access to its natural resources.

<sup>30</sup> See Adams (1995), Albert (1994), Batisse (1997), Cowell and Owens (1998), and de Oliveira (2002) for more on this 'bait and switch' technique. In some instances, local peoples have been killed for refusing to move (see Peluso 1993 and Schroeder 1993, 1995).

<sup>31</sup> Also, see Stonich (1998), Ghimire (1994) and Zimmerer (2000)

<sup>32</sup> Also, see Blaikie (1985, 1995), Bloch (1993), Carney (1993), Hershkovitz (1993), Kearns (1998), Neumann (1995, 1996), Peluso (1993), Schroeder (1993), and Zimmerer (1993).

## The Increased Wealth Differentiation Among Social Classes

The transformation of broad international conservation and development policies into local protected areas' policies is one in which stakeholders with various goals, land use ideology, and social practices jockey to influence their interpretation, and thus, their outcome (see Blaikie and Muldavin 2004).<sup>33</sup> Thus, critics find that irrespective of the breadth of projects, their implementation requires alliances with local politically, socially, and/or financially prominent groups (see Brohman 1996, McAfee 1999, Schelhas and Pfeffer 2005). Each group's relative influence is based on its objectives and institutional capacity (see Brinkerhoff 1996, Lemos 1998).<sup>34</sup> Protected areas' economic development then usually initiates changes in natural resource use where profits flow to those who are better positioned to mobilize capital and labor, and therefore determine who benefits.<sup>35</sup> The differentiation between social classes occurs whether or not projects are planned at national, regional or local scales (see Agrawal and Gibson 1999, Belsky 1999, and Young 1999a).

## The Homogeneity of Communities

Researchers find that 'local scale' or 'community level' planning is not necessarily the most viable option for the development of protected areas' policies since participatory-developed conservation policies are usually planned without knowledge of local social dynamics, and of larger political and economic groups that influence local

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<sup>33</sup> Also, see Blaikie, Cameron, and Seddon (2002).

<sup>34</sup> Institutional capacity in protected areas is often embedded in national political support (see Brinkerhoff 1996, Lemos 1998), and that of local populations (see Hannah et al. 1998, Salih 1999).

<sup>35</sup> The negative impact that protected areas' development has had on developing countries' social classes is well documented. For detailed historical reviews, see Albert (1994), Belsky (1999), Ghimire (1994) Charnley (2005), Gibson and Marks (1995), Stonich (1998), and Young (1999a, 1999b).

competition and conflict (see Andersson, Gibson and Lehoucq 2006 and Slater 2004).<sup>36</sup> In fact, far from being homogenous, researchers find that local peoples' history has often been filled with exploitation, marginalization, division, and conflict among themselves and/or outsiders (see Agrawal and Gupta 2005, Kleemier 2000).<sup>37</sup> Thus, in general, local communities are shared sources of concern for place and civic activism (Agrawal and Chhatre 2006, de Castro and McGrath 2003).<sup>38</sup> They are not necessarily groups of people who are homogenous in their desire for conservation and development (see Blanchet 2001, Purcell and Brown 2005, Twyman 2000).<sup>39</sup>

#### *The Millennium Ecosystem Assessment*<sup>40</sup>

In recognition of the research still needed for improved management of natural resource use, the United Nations Secretary General in 2000 launched the Millennium Ecosystem Assessment.<sup>41</sup> The goals of this body of academicians and practitioners are to identify ways in which to study global natural resource use, and to develop global benchmarks for various ecosystem services. The analytical framework that underpins these studies accommodates not only multiple temporal and spatial data and analyses, but also qualitative and quantitative methods that are necessary to conduct human-environment research (Defries et al. 2005).

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<sup>36</sup> 'Community', 'local scale', 'community-based', 'local community', 'local peoples' are terms that are used interchangeably in the environment and development literature (see Agrawal and Gibson 1999, Belsky 1999, Gibson and Marks 1995, McDaniel 1997, Western and Wright 1994, Young 1999a, 1999b). See Anderson (2002) and Kingdon (2002) for theories and critiques of the public policy process.

<sup>37</sup> Also, see Agrawal and Gibson (1999), Belsky (1999), Leach, Mearns, and Scoones (1999).

<sup>38</sup> Also, see Biggs and Smith (1998), Horowitz (1998), Kleemeier (2000), Michener (1998), Warner (1997), Wright (1994), Whitt and Slack (1994).

<sup>39</sup> Also, see Little (1994), Murphree (1994), Mohan and Stoke (2000).

<sup>40</sup> The full text of the Millennium Ecosystem Assessment's *Ecosystems and human well-being (2005)* is available online at <http://www.millenniumassessment.org>. This document/book covers the Millennium Ecosystem Assessment (MA) from its inception in 2001 to the sub groups' reports in 2005.

<sup>41</sup> The findings from this research (as it is for all MA appointed working groups) inform the Convention on Biological Diversity (1992), the Convention on Wetlands (also known as the Ramsar Convention) (1971), the United Nations Convention to Combat Desertification (1994), and the Convention on Migratory Species' (1979) ongoing projects (Millennium Ecosystem Assessment 2005).

## SUMMARY

In general, the social science critique of protected areas notes that one common problem that underpins changes in most protected areas' is the changes in its natural resource use. Thus far, the literature review shows that the idea of 'nature' as non-humanized and the lack of a legal title have been used to trigger these changes, and the attempted redress with 'substitute lands' has failed. Further, critics find that as humanized areas, protected areas are underpinned by dichotomous meanings of nature that continue to influence changes in local populations' natural resource use. The impacts of these changes manifest themselves most notably in the increased differentiation between social classes, and the relative power of groups that exists in highly heterogenic communities.

Though extensive, much of the discourse rest in the assumption that protected areas are similar [and thus, remedial plans can be uniform] when in fact the demographic, cultural, political and other socioeconomic variables that are encountered in some developing countries' protected areas are vastly different from those encountered in others. To illustrate, unlike some developing countries whose protected areas are largely part of their early colonization model (for example, Kenya and Tanzania), or whose protected areas are largely *purchased* forests (for example, El Salvador and Costa Rica), other developing countries' protected areas are landscapes that have played significant economic roles in their colonization model. For these developing countries, their protected areas have already undergone significant land use change for traditional monocrops, such as sugar, and/or relatively newer land use, such as tourism. More importantly, though, their protected areas are often critical to their socioeconomic development. Thus, operations in these areas are often facilitated through significant institutional capacity.

For these developing countries, it is likely that entrenched land ownership patterns, shared histories, the relative power of groups, and demographic changes are significant influential factors in protected areas' land use change, and not conservation policies.

Thus, in developing countries with dominant colonial and non-colonial economic landscapes, to what extent can participatory-planned protection areas' management policies influence changes in the use of natural resources? How homogenous are groups that have shared histories, or for whom dividing lines are blurred because group members are not that distinct? And what of demographic factors? To what extent do demographic variables such as age, income and education influence the perception of changes in the protected area? These latter issues that have yet to be addressed and therefore they underpin this dissertation research in the Negril Environmental Protection Area.

Next, chapter three introduces the Negril Environmental Protection Area. It focuses on some of the basic issues that set it apart from the more commonly discussed protected areas.

### **CHAPTER 3**

#### **THE NEGRIL ENVIRONMENTAL PROTECTION AREA**

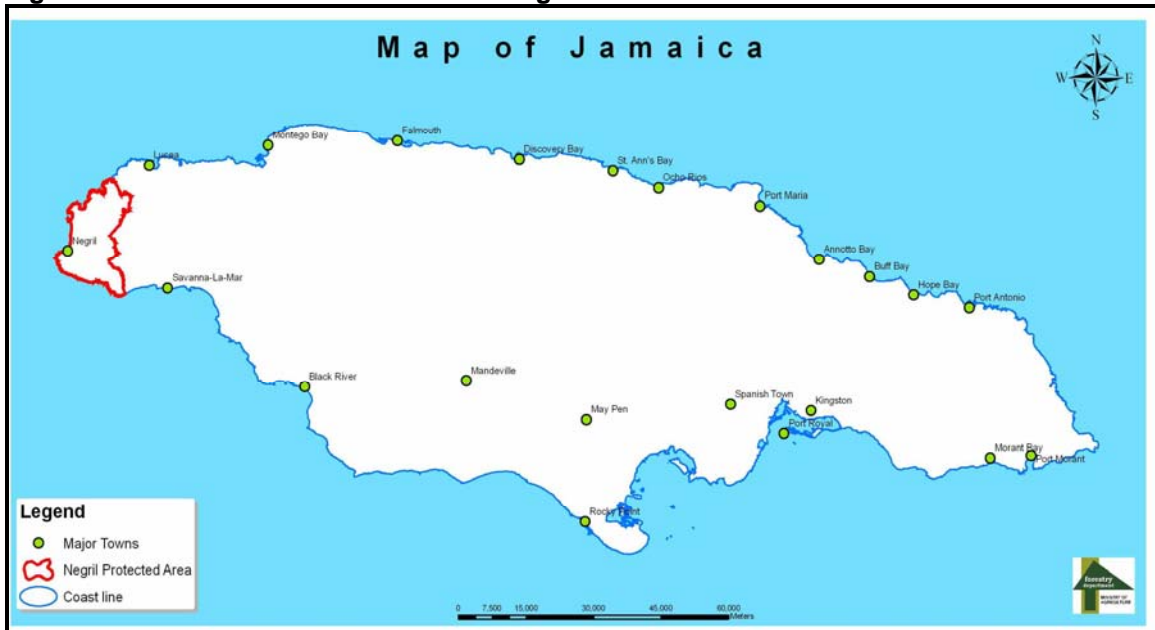
This chapter describes the Negril Environmental Protection Area, western Jamaica (Figure 3.1). This description of Negril is important since it lays out the human and physical conditions that exist during the drafting of the protected areas' policies. The chapter focuses on Negril's physiography, land use patterns and demographic characteristics. Knowledge of Negril's physiography is important to the research since it shows the physical constraints and opportunities that exist for the protected area's populations. Negril's physiography underscores Negril's current land use as well as the push for its protection area status.

Next, an understanding of Negril's land use is essential to the research because it shows the fundamental socioeconomic, cultural and political structure that exists in the protected area. This examination of Negril's land use focuses on the fishing, tourism and sugar groups' *operations, management or regulating agencies and populations*. The national government recognizes each group as a principal natural resource user and a primary contributor to the degradation of Negril's physical environment. Further, this examination focuses on these groups since their varied histories and relative power positions will better allow one to examine the complex issues that influence changes in Negril's natural resource use.

Lastly, Negril's demographic characteristic is of particular interest because the extent to which it changes triggers various demand on the protected area's natural resources. This description of the demographic structure focuses in particular on the changes between the 1991 and 2001 population census. Though the rate of change



**Figure 3.1 The Relative Location of the Negril Environmental Protection Area**



Courtesy of the Ministry of Agriculture, Forestry Division, Kingston, Jamaica. August, 2006.

may differ in the future, this examination will nevertheless offer some perspective on the likely course of future growth, and the ensuing policy responses to such changes. This description of the protection area begins with Negril's physiography, followed by its land use patterns and lastly, its demographic characteristics.

#### THE PHYSIOGRAPHY

The Negril and Green Island Watersheds, and the Statistical Institute of Jamaica's (STATIN) Enumeration Districts define Negril's terrestrial boundary (Government of Jamaica 1997b). Thus, Negril's terrestrial area measures about 40,000 hectares and cuts across the adjoining western parishes of Hanover and Westmoreland. Its aquatic boundary extends 3.2 kilometers into the Caribbean Sea to the 105th depth contour. Hence, it is bounded in the north, west and south by the Caribbean Sea, and in the east, by eastern Hanover and eastern Westmoreland.

Figure 3.2 shows that Negril's geologic structure is primarily tertiary limestone and interior valley alluvia (see Price 1960, Stark 1964).<sup>42</sup> Along the seacoast, in most areas, elevated coral reef rocks, rising to more than fifteen feet in some places, forms a barrier with the sea. In other areas, where houses are built close to the sea, sea level rise is a major concern since at high tide homes are flooded repeatedly (Government of Jamaica 1997b).<sup>43</sup> Limestone areas are typically in the interior hilly regions and along the southwestern coast where soils are thin infertile erodable loam. Negril Hills (the entire southwest), with its sharp outcropping of limestone rocks and frequent ravines, represents the largest extent of this phenomenon. Figure 3.2 shows that interior valley alluvia are typically in the river valleys and the Great Morass. Thus, soils over alluvia are primarily in the relatively flat north east, southeast and the Great Morass (Stark 1964).

Figure 3.3 shows an interconnecting network of rivers that emerge from the foothills of the Campbelton, Fish River, and Orange Bay Mountains to feed the Great Morass and the relatively flat northeastern and southeastern areas.<sup>44</sup> In some areas, these rivers disappear into limestone bedrock and later resurge as springs (Goreau and Goreau 1996).<sup>45</sup> In others, they meander through Negril's farmlands to the Caribbean Sea (Goreau and Goreau 1996).

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<sup>42</sup> The oldest rocks were formed more than 100 million years ago. Thirty million years ago, the Caribbean and North American plates' tectonic movement pushed Jamaica below sea level. Over the last 10 million years, the island has faulted upward more than 2,000 meters. The limestone noted is deposited on older volcanic and sedimentary rocks (see Price 1960, Stark 1964).

<sup>43</sup> See Douglas, Kearney and Letterman (2001) for more on sea level rise.

<sup>44</sup> This section of Jamaica's central mountain range includes the Fish River, Campbelton, and Orange Bay Mountains. These mountains fall within the protection area, and are the last remaining primary dry forests in the region (Rural Agricultural Development Agency 1999, 2004).

<sup>45</sup> Thus, caves, precipitous gullies, and sink holes are common in this area (Price 1960, Stark 1964)

Figure 3.2

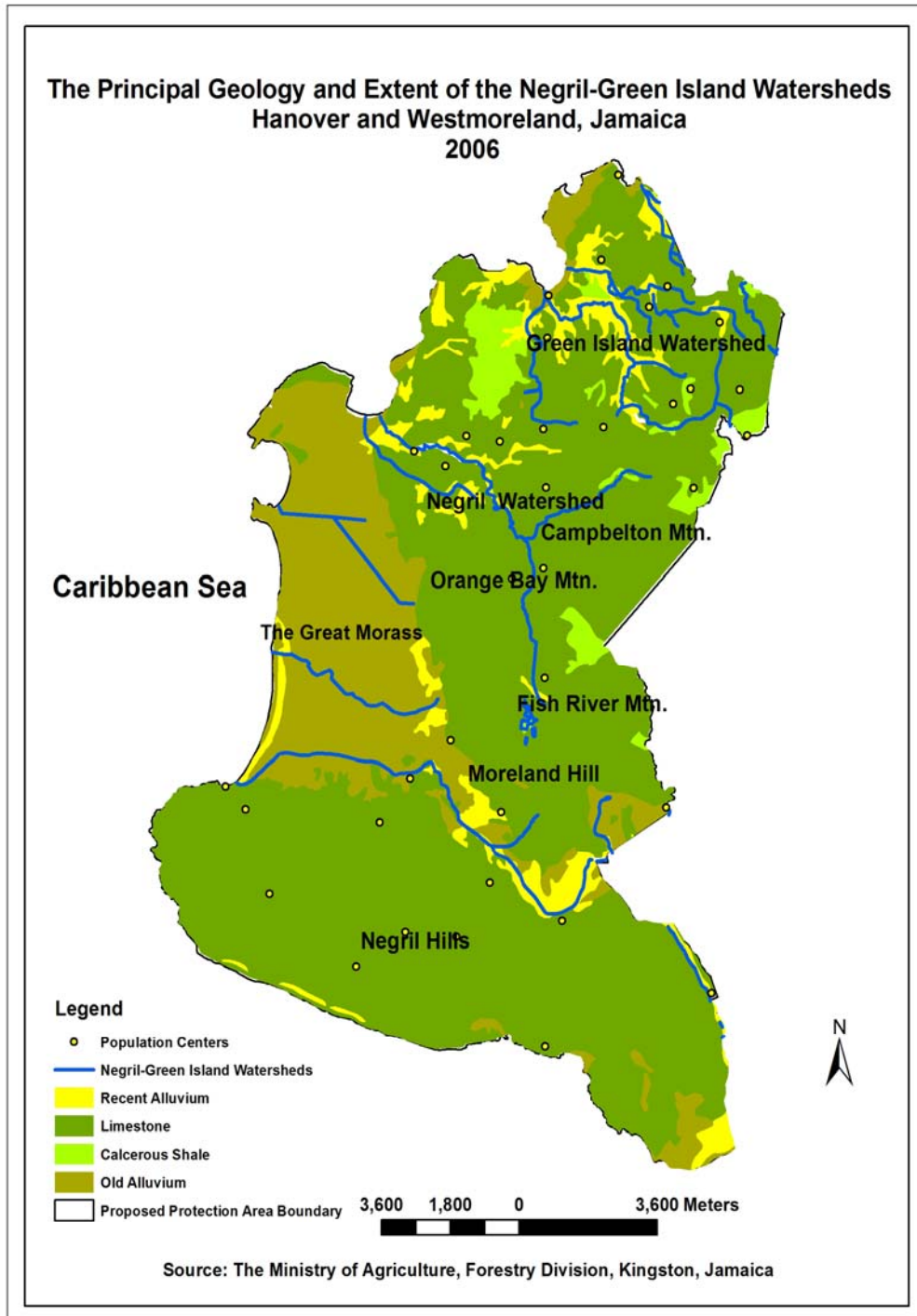
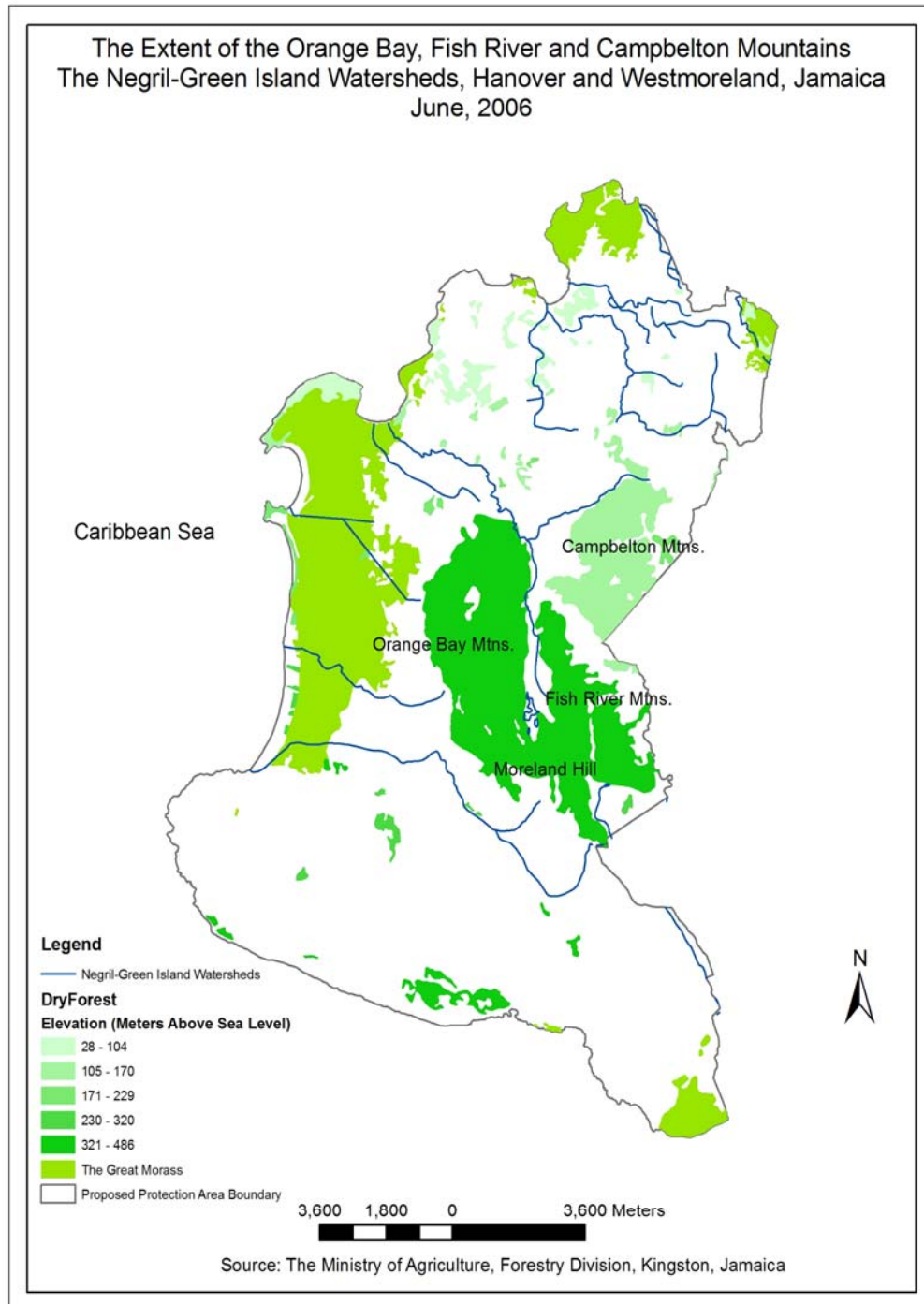


Figure 3.3



Negril experiences annual average rainfall ranging from 108 inches in the south and southeast to 60 inches in the north and northwest (Sugar Industry Research Institute 2005).<sup>46</sup> It experiences wet seasons from April to May and September to October, and dry seasons from June to August and November to March with average temperatures ranging from 85 degrees in December and January to 96.5 degrees in July and August (Sugar Industry Research Institute 1997, 2001, 2005).

Negril's geology and the resulting soil structure as well as its weather patterns have created distinct geographic zones with characteristics that are conducive to certain types of vegetation. Thus, Figure 3.4 shows that Negril's dry southwest (Negril Hills) is primarily tropical savanna. In contrast, Negril's northeastern and southeastern tips as well as most of its entire western border are wet forests. Negril's extensive beaches are interspersed with wet forests and coral reef outcroppings.

#### THE PATTERN OF LAND USE

Negril's land use patterns reflect hundreds of years of social and economic change (Anonymous 1754 a, b). This examination of Negril's land use begins with a broad description of the relative location of particular features. It then briefly describes Negril's fishing, sugar and tourism's land use. Within the foothills of the central mountains, small mixed farms dot an otherwise sparsely vegetative landscape (Rural Agricultural Development Agency 1999, 2004).<sup>47</sup> Like most of the three mountain peaks, the foothills are Crown Land on which the landless farms (Hanover Parish Council 2001, Westmoreland Parish Council 2001, Rural Agricultural Development Agency 1999,

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<sup>46</sup> The sugar industry refers to this area as the 'wet west.' The average rainfall in this area is the highest for western Jamaica. In fact, nationally, this area is second only to the eastern section of the parish of Portland in the east (Sugar Industry Research Institute 2005).

<sup>47</sup> Small mixed farms are typically about a square (a square is 1/16<sup>th</sup> of an acre), and are rotated through three years active use and one year fallow. Small mixed farms consist primarily of yams, sweet potatoes, cassava, gungo peas, and corn.

2004).<sup>48</sup> Extending from the foothills, mixed farming, grazing or residential development usually occur on land that is greater than a fifteen-degree (15°) incline (Rural Agricultural Development Agency 1999, 2004). Sugar cane farming lands are usually land that is less than or equal to a fifteen degree (15°) incline (Rural Agricultural Development Agency 1999, 2004).

In occupying almost 76% of Negril's arable land (Rural Agricultural Development Agency 1999, 2004), sugar cane farming strongly influenced the relative location of Negril's other land uses (Figure 3.4). In fact, as the last area in Jamaica to be transformed into sugar cane fields (Anonymous 1764, West Indies Sugar Company of Jamaica 1793), Negril's traditional transport routes and residential development patterns reflect the location of sugar cane fields relative to the West Indies Sugar Company's (Frome) Sugar Factory (West Indies Sugar Company of Jamaica 1873, 1886).

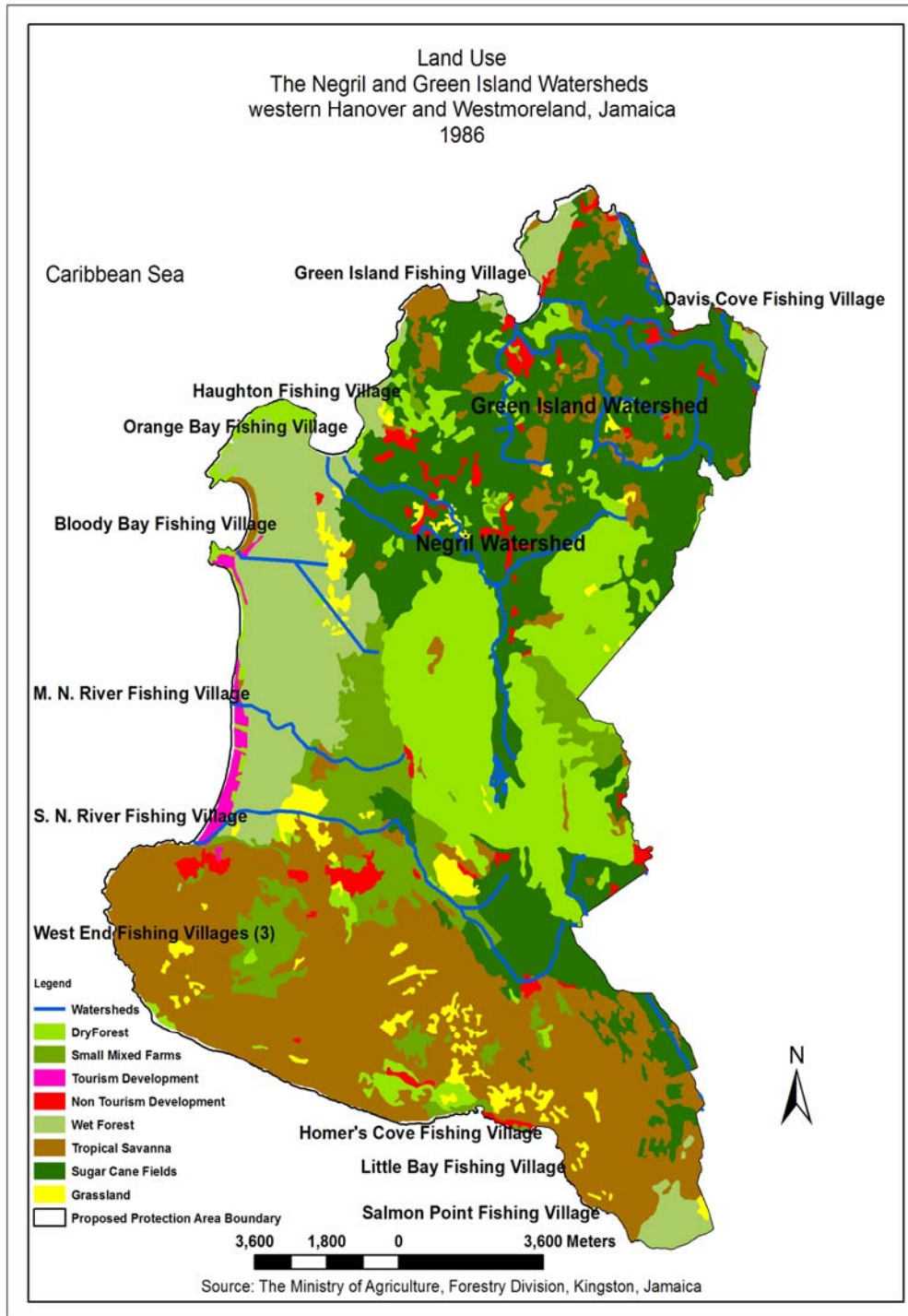
In contrast to newer residential development, such as that of Orange Bay, Hanover, traditional residential areas are primarily linear since they occur along Negril's traditional sugar routes (Figure 3.4).<sup>49</sup> In fact, most early residential areas developed as extensions of sugar estates (West Indies Sugar Company of Jamaica 1873, 1886). For early populations, these areas were also conducive to residential use since they allowed easy access to water supply (rivers and springs). In the late 1960s to 1970s, this traditional style of residential development changed with the expansion of tourism along the coast,

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<sup>48</sup> Crown land is land that is owned by the Jamaican government.

<sup>49</sup> Residential land use includes churches and church run pre kindergarten schools, primary (elementary) schools and at home businesses since these land uses are tightly interspersed with houses. In fact, some primary (elementary) schools and churches were once houses.

Figure 3.4



and the accompanying improved infrastructure in the surrounding population centers (McHardy 2002).

Tourism development, fishing villages and a few private residences account for Negril's coastal land use. Tourism development is primarily along the western edge of the Great Morass where Negril's beaches run uninterrupted for almost five miles. Like residential development, Negril's tourism development is primarily linear since it not only hugs the coastline, but also it follows closely the relatively new highway that connects Negril to the Donald Sangster's International Airport in Montego Bay. In contrast, Negril's fishing villages are primarily located close to river mouths.

Based on the protected areas physiography, Negril's fishing, tourism and sugar groups are strategically located to maximize economic returns. However, while the sugar group occupies farmlands almost exclusively, the tourism group competes with fishing for Negril's coastline. The brief description of each group that follows focuses on its history, its various socioeconomic and political associations that are likely to influence the implementation of the industry-specific protected area's management policies, and lastly, the associated population. The discussion on each group's population is limited to those who are at the forefront of operations.

### The Fishing Industry

Though not clear on a start date, in 1793, the West Indies Sugar Company (WISCO) placed fishing at the 'outer extent of the swamplands to the west of the Orange Bay and Haughton Sugar Estates' (West Indies Sugar Company of Jamaica 1793).<sup>50</sup> Thus, for

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<sup>50</sup> This is the earliest identified documented record of fishing in the area. The sugar industry's records note the salinity and swamp characteristics of the coastal area as the primary reasons that it was unsuitable for sugar cane farming (West Indies Sugar Company of Jamaica 1793). Until the late 1960s, swampland, measuring up to one mile at its widest point, prevented motor vehicle access to Negril's beach areas.



more than 300 years, Negril's fishing industry has provided food and income to Negril's changing population. The Urban Development Corporation (UDC) (1974) notes that Negril's fishermen have traditionally fished the entire coastline from Davis Cove in the northeast to Salmon Point in the southwest and berthed anywhere on the beaches (see Figure 3.4).

### The Operations

There are nine clearly defined fishing villages in Negril with numerous unclassified 'fishing spots' (see Figure 3.4). Fishing villages are one eighth of an acre or less in size. However, most fishing villages are beach 'strips', with berthing lines attached to nearby mangrove trees. In general, zinc clad storage sheds with dirt floors, unpainted canoes, and a few single engine boats characterize most fishing villages.<sup>51</sup> Sheds are subject to flooding at high tide because they are built relatively close to the coastline. Storage sheds typically house freezers (to store fish catch until sold) and fishing equipment.

The primary fishing equipment used are canoes and oars, hooks, lines, spear guns, fish pots and nets. At a cost of J\$28,000 (US\$425), canoes and oars are major investments that are passed on to family members.<sup>52</sup> In general, some canoes are used repeatedly each day by various fishermen.<sup>53</sup> In fact, on average, each canoe usually serves two fishermen. While fishing lines are used by most fishermen, younger fishermen increasingly use spear guns. However, without an oxygen tank, these fishermen are

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Individuals that settled in this area were said to be living on the 'fringes of society' (West Indies Sugar Company of Jamaica 1793).

<sup>51</sup> Zinc sheets are commonly used as roofing material in rural Jamaica.

<sup>52</sup> At J\$8,000 (US\$130) per role, wire threads for making nets are next, with fish pots third (J\$5,000/US\$62). The conversion rate is based on the 2003 to 2005 average that the Bank of Jamaica sets.

<sup>53</sup> Many fishermen cannot afford to purchase canoes. Those that cannot typically borrow from those that can.

limited to ‘one minute dives,’ and fish catch is limited to that which they can carry while shooting their next target.

Since fishermen primarily work for themselves, most fishing villages do not have an organized record keeping system. Fishermen do not maintain detailed records on fish type caught. Rather, they record and report total fish catch, regardless of type, to the Ministry of Agriculture, Fisheries Division. Similarly, regardless of fish type, fishermen at most fishing villages sell fish at a standard price per pound. The cost of fish per pound varies with distance from Negril’s urban center. Area households, bars, and restaurants purchase the protected area’s fish catch.<sup>54</sup>

#### The Management

The Negril Fishermen’s Cooperative (NFC), the Negril Coral Reef Preservation Society (NCRPS), and the Ministry of Agriculture, Fisheries Division are the primary groups that are associated with Negril’s fishing industry. Each regulates a different aspect of Negril’s fishing industry. For example, while the Ministry of Agriculture, Fisheries Division issues licenses to registered fishermen, only the Negril Fishermen’s Cooperative (NFC) has the right to sell government approved fishing nets, lines, fish rods, hooks, and baits to licensed fishermen. The Negril Coral Reef Preservation Society (NCRPS) guides the industry on fish catch size and type as well as approved equipment. The Negril Fishermen Cooperative’s Board of Directors includes representatives from Negril’s fishing villages, the tourism group, the conservation group, and the Negril Chamber of Commerce (NCC).

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<sup>54</sup> The protection area’s hotels have historically bought fish from elsewhere (Urban Development Corporation and Design Collaborative 1982).

## The Population

More than 500 families fish in Negril. However, very few fisher families live in the fishing villages. Most travel by bicycles or motorbikes to and from 'work.' Here, grandfathers, fathers, brothers, uncles, sons, nephews and grandsons are fishers, net or spear repairmen, and/or fish pot and canoe builders or repairmen (Negril Fishermen's Cooperative 2005). Thus, Negril's fishing industry is primarily comprised of extended families. In fact, by age 16, younger family members are taught fish types and routes, tides, currents, wind patterns, clouds and moon phases through experience and observation. This knowledge is verbally passed on from one generation of men to the next. Lastly, although women may tend the fishing villages' cook shops, Negril's fishing industry is comprised of primarily men ages 16 to 85.

## The Sugar Industry

For more than 300 years, sugar cane farming has dominated Negril's land use (see Anonymous 1775). In fact, in the late 1700s, the Frome Sugar Factory was producing more than 48,000 tons of sugar from the West Indies Sugar Company's (WISCO) sugar estates in Hanover and Westmoreland.<sup>55</sup> In the late 1700s, WISCO, a British sugar company, controlled almost all the sugar cane farmlands in the protection area (Anonymous 1754a, b), and processed all of its sugar cane. This control significantly influenced the current settlement patterns, class structure and the existing Diaspora (Bryan 2000, Sheridan 2000).

## The Operations

Today, the role that sugar has played in western Jamaica's social and economic development is evident in the extent to which sugar cane farms still dominates land use in

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<sup>55</sup> This is the earliest identified reference on sugar in western Jamaica.

the Negril and Green Island Watersheds. Sugar cane lands are still held in large tracts that tend to pass in their entirety to other family member's control or other sugar cane families (see Hanover Parish Council 1981, 1987, 1992, 2001; Westmoreland Parish Council 1980, 1985, 1990, 2001). Thus, after 300 years, the planter class still controls Negril's sugar cane lands, and the Frome Sugar Factory and Estate (now the Sugar Company of Jamaica (Frome Division)) still controls the protected area's sugar production.

With more than 70% of Negril's arable land under sugar cane production, the Frome Sugar Factory and Estate is at the center of the industry's development. The Frome Sugar Estate is significant in that not only does it house the national government's largest sugar factory, but also, annually, it pumps an estimated J\$40 million (approx. US\$.5M) in the parishes of Hanover and Westmoreland's economies through workers' savings, academic scholarships and the funding of community centers' activities (James 2001, 2004). The Frome Sugar Estate employs about 1,500 people, but with Jamaica's cultural pattern of extended families, it actually supports an estimated 12,000 people (Planning Institute of Jamaica 1999).

#### The Management

The Sugar Company of Jamaica (Frome Division), the Sugar Industry Research Institute, the All Island Cane Farmers' Association, the Bustamante Industrial Trade Union and the National Workers Union are the primary groups that are affiliated with the protected area's sugar industry. The Sugar Company of Jamaica (Frome Division) is one of five sugar estates that the Sugar Company of Jamaica now operates, but it is the largest in terms of acreage, sugar production and employment. The Sugar Industry Research

Institute (SIRI) is the Sugar Industry Authority's (SIA) subsidiary that is responsible for sugar cane testing, and fertilizer and spectracide development and distribution to the protected area's sugar cane farmers.<sup>56</sup> Additionally, the Sugar Industry Research Institute sells cane seeds to sugar cane farmers.<sup>57</sup> The Sugar Company of Jamaica (Frome Division) advances fertilizer, spectracide and/or seeds to farmers, and withdraws the cost from subsequent sugar cane payments.

Next, the All Island Cane Farmers' Association is said to represent farmers' interest negotiations on factory gate sugar prices, sugar cane harvesting season, sugar cane harvesting quotas, loan repayment schedules and interest rates. However, its Board of Directors is comprised of rum distillers, bankers and other key industry personnel who the Ministry of Agriculture and/or the Managing Director of the Sugar Industry Authority (SIA) recommend, not sugar cane farmers (The All Island Cane Farmers' Association 1988, 1990, 1995, 2000, 2005).

Finally, the Bustamante Industrial Trade Union and the National Workers' Union represent sugar cane workers at the Sugar Company of Jamaica (Frome Division). Both have been instrumental in the continuity of sugar in the region while pressing for better compensation and working standards for their members.

### The Population

More than 1,300 sugar cane farmers and 900 field workers are part of the protected area's sugar industry. Almost 80% of the protected area's farmers operate sugar cane farms that are ten hectares or less, and employ an average of eight temporary field

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<sup>56</sup> SIRI provides this service to the entire sugar industry but this discussion is limited to its operations within the protection area.

<sup>57</sup> Usually, sugar cane seeds are for new sugar cane fields, or a replanting of a furloughed field. In general, farmers replant with their own ratoons. Ratoons are pieces of sugar cane that has about five joints each, and thus, five possible areas for rooting and growth. Ratoons are planted horizontally to maximize soil contact.

workers during harvesting and planting seasons. The other 20% own relatively large sugar cane farms and employs 'regular' workers. Since success in the industry depends on precise schedules and familiarity with each farm's soil and sugar cane type, large farmers prefer to employ a permanent workforce. In general, large farmers employ one permanent worker for every three hectares harvested. Each permanent worker is rotated to different areas of the farm/estate (The All Island cane Farmers Association 1990, 1992, 1996, 2001, 2005). In general, farmers tend to be primarily men, age 50 or more (Sugar Company of Jamaica 2004). Likewise, field workers are primarily men whose minimum age exceeds 30 (Sugar Company of Jamaica 2004). In fact, less than 8% of the field workers are under age 35, and only 3% of the total are women.<sup>58</sup>

#### The Tourism Industry

Negril's tourism began in the early 1960s with less than 100 visitors (Urban Development Corporation and Design Collaborative 1974). Then, Negril's tourism industry was characterized by backpackers who shared 'fire sides' and 'fish fries' with fishermen, and pitched tents and rolled beds on its accessible beaches (Urban Development Corporation and Design Collaborative 1974). This idyllic setting changed after Negril's 1968 zoning as a commercial area. Fishermen who could not afford the levies on their 'piece of the swamp' sold their land to Jamaican and foreign investors and retreated into Negril Hills (Urban Development Corporation and Design Collaborative 1974).<sup>59</sup> Negril's commercial zoning facilitated the more structured and large-scale tourism development envisioned by the national government (see Urban Development Corporation and Design Collaborative 1974).

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<sup>58</sup> As observed on the sugar cane survey population list.

<sup>59</sup> Most fisher families move to Red Ground, a relatively new community in Negril Hills (Urban Development Corporation and Design Collaborative 1982)

## The Operations

Negril's tourism development took two distinct directions. From the Hanover-Westmoreland boundary heading further west and southwest, Negril's tourism development reflects the traditional aspects of the area's industry (see Figure 3.4: The Hanover–Westmoreland boundary lies horizontally approximately along the now 'buried' *Middle Negril River*). Accommodations in this section of Negril is understated, and consist primarily of small hotels, villas and guest houses that are owned and managed by former fishermen, and/or other early relatively small investors. From the Hanover-Westmoreland parish boundary heading east and north east, tourism development is primarily in the form of large hotels, expansive villas, and super clubs. This latter type of tourism development significantly changed the culture of Negril's tourism from a 'mom and pop' atmosphere with few workers to one that planned every aspect of visitors' time, and thus uses extensive labor and utilities. With this latter change in the area's tourism development model, and the arriving clientele, Negril is now Jamaica's third largest tourism region (Jamaica Tourist Board 2005).

## The Management

The Jamaica Hotel and Tourist Association (JHTA), the Negril Resort Board (NRB), and the Tourism Product Development Corporation (TPDCo) are the primary groups that are associated with Negril's tourism industry.<sup>60</sup> The JHTA and TPDCo operate nationally while the Negril Resort Board is primarily concerned with Negril's tourism development. The JHTA has existed since the 1970s and represents primarily large hotel owners/managers, duty free shop operators, and tour company owners. In contrast,

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<sup>60</sup> The Negril Chamber of Commerce operates under a much broader charter since it is also concerned with Negril's broader social and economic development.

TPDCo is a quasi government agency (attached to the Ministry of Tourism) that is primarily concerned with improving the national tourism ‘product’ through training programs and seminars for industry workers. However, the Negril Resort Board focuses solely on the improvement of Negril’s tourism and its membership is inclusive of all businesses that are part Negril’s tourism industry.

### The Population

Wealthy Jamaicans own much of the tourism structures in Negril. The industry experiences a high worker turnover rate. Most seasonal workers are young women age 35 and under who travel from villages within as well as external to the protected area (Bolles 2002, 2004, 2006). These women are primarily kitchen and housekeeping staff. Other workers include cab drivers, ‘street cooks,’ hair-braiders, craft vendors and non-hotel affiliated water sports’ operators (Planning Institute of Jamaica 2005). In general, employers terminate workers for the slightest infraction against tourists (Haughton 2005, Lockhart 2005).<sup>61</sup> However, a ratio of one and a half worker per room is usually maintained to provide guests with the level of personal service that Negril advertises (The Jamaica Hotel and Tourists Association 1990, 1993, 1997, 2001, 2005). Workers, in general, serve tourists arriving primarily from the United States (71 %), Canada (15 %), Europe (10 %) and Asia (3 %) (Jamaica Tourist Board 2005).

In summary, the fishing, tourism and sugar groups’ natural resource use reflect their varied histories and use of Negril’s physiography. Since their economic operations are labor-intensive, they have influenced the number and type of jobs that are available to Negril’s population. However, since they are said to have significantly contributed to the

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<sup>61</sup> Celia Haughton and Sandra Lockhart are pseudonyms for two women that have each worked at two different hotels in Negril for almost thirteen years.



degradation of the watersheds, industry-specific conservation policies that influence their natural resource use are likely to affect the number and type of jobs that are available to Negril's population.

#### THE CONSERVATION OF NEGRIL

The idea to conserve Negril and its environs emerged from the Negril Chamber of Commerce Environmental Committee's concern that the immense changes in the area's land use in the 1980s are likely to have negatively impacted the area's coral reefs (Negril Chamber of Commerce 1987). Internationally funded watershed studies show relatively high levels of phosphorus and nitrogen in the area's rivers and sink holes (Lapointe 1992, Goreau 1992, Goreau and Goreau 1996). Extensive field work conducted throughout the Negril and Green Island watersheds show that local populations bathing and clothes laundering in the area's rivers and sink holes, and fertilizer runoff from the area's sugar cane fields are major phosphorous and nitrogen sources (Lapointe 1992, Goreau 1992, Goreau and Goreau 1996). Additionally, these studies find relatively high levels of nitrogen in the coastal waters bordering resort development (Lapointe 1992, Goreau and Goreau 1996).

To guide future land use, a Negril Coral Reef Preservation Society steering group held town hall meetings at primary/all-age schools throughout the proposed protection area (The Negril Coral Reef Preservation Society 1991, 1992, 1993). The committee announced meetings thru loudspeaker public announcements throughout the proposed protected area's villages (The Negril Coral Reef Preservation Society 1991, 1992, 1993). These meetings gave residents the opportunity to voice their concerns about the proposed conservation of Negril and to identify issues that they think should be addressed (The Negril Coral Reef Preservation Society 1991, 1992, 1993).

In general, an audit of 30 of the 92 randomly selected question and answer recorded sessions showed that Negril's population does welcome conservation. The audit finds that meeting attendees generally believe that what is best for Negril is also best for them. In fact, the statement '...we are one with Negril, so what is good for Negril is good for me...' was commonly reiterated at the meetings (Negril Coral Reef Preservation Society 1991, 1992, 1993). In 76% of the meetings audited, most residents want conservation since they see it as the 'best' way of reclaiming 'the environment.' In particular, these residents want to prevent the further 'deterioration' of Negril's environment since they expect that with the policies in place, water quality in sink holes, and sea life, in general, will 'improve.' Further, they want the conservation policies to block further hotel construction since the existing hotels already block their view of the sea and access to the area's beaches.

#### The Management of the Protected Area

The National Environmental and Planning Agency transferred daily management of the protection area on its 1995 gazetting to the Negril Environmental Protection Trust.<sup>62</sup> The Negril Coral Reef Society works in conjunction with the Trust but is primarily concerned with the management of the Negril Marine Park. The United States Agency for International Development, the European Union and the World Conservation Union provide much of the local agencies' total operating funds (The Negril Coral Reef Preservation Society 1995, 1997, 1999, 2001, 2005; The Negril Environmental Protection Trust 1996, 1997, 2001, 2003, 2005).

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<sup>62</sup> Jamaica's laws and regulations become active on the day that notification is published in *The Jamaica Gazette*.

Overall, the local populations wish for the conservation of Negril's natural resources underpins the fishing, sugar and tourism industry-specific policies. However, these changes are occurring while Negril is experiencing significant demographic changes.

#### THE MAJOR DEMOGRAPHIC CHARACTERISTICS OF NEGRIL

Based on the 2001 Population Census, about 30,000 persons reside permanently in the protected area (Statistical Institute of Jamaica (STATIN) 2001a). This number represents an astounding 21% increase over the 1991 population total (Table 3.1). This description of Negril's demographic characteristics focuses primarily on *age, gender, and education level*. *Landownership* (a non-demographic variable) is also included in the examination since Negril's landownership structure is likely to condition the implementation of the protected area's management policies.

##### Age and Gender

In 2001, about 40% of the population was age nineteen and under (Table 3.1). At 26%, the largest percentage of the population was between ages 20 and 29. Of the remaining 33%, 15% were between ages 30 and 39, and about 5% were ages 60 or more (Table 3.1). When the 2001 data is compared to 1991, the largest increase in the population occurred in the 20-29 and 30-39 age groups. All other age groups showed relative declines. Females accounted for the majority of the population in 1991 and 2001. In fact, females exceed males in the 20-29 and 30-39 age groups in 2001 (Table 3.1).

**Table 3.1**

The Population's Age and Gender Distribution The Negril Environmental Protection Area 1991 and 2001												
Age Group	1991 Male		1991 Female		1991 Total	1991 % Total	2001 Male		2001 Female		2001 Total	2001 % Total
	Num	%	Num	%			Num	%	Num	%		
≤9	3,351	26.61	3,261	26.33	6,612	26.47	3,485	26.61	3,344	24.56	6,829	22.57
10-19	2,876	22.83	2,647	21.38	5,523	22.11	2,991	22.84	2,719	19.97	5,710	18.87
20-29	2,613	20.74	2,561	20.68	5,174	20.72	3,311	20.75	4,673	23.35	7,984	26.39
30-39	1,211	9.61	1,361	10.99	2,572	10.30	1,758	9.61	2,674	12.61	4,432	14.65
40-49	921	7.31	951	7.68	1,872	7.50	957	7.31	989	7.27	1,946	6.43
50-60	865	6.87	821	6.63	1,686	6.75	900	6.89	854	6.27	1,754	5.80
≥60	756	5.92	781	6.31	1,537	6.15	786	6.0	812	5.96	1,598	5.28
Total	12,593		12,383		24,976		14,188		16,065		30,253	

**Sources:**

The Population Census, 1991, Volume 1, Part 9, Parish of Hanover (Statistical Institute of Jamaica 1991a).

The Population Census, 1991, Volume 1, Part 10, Parish of Westmoreland (Statistical Institute of Jamaica 1991a).

The Population Census, 2001, Volume 1, part 9, Parish of Hanover (Statistical Institute of Jamaica 2001a).

The Population Census, 2001, Volume 1, Part 10, Parish of Westmoreland (Statistical Institute of Jamaica 2001a).

Enumeration Map of western Jamaica (Statistical Institute of Jamaica 2005).

**Note:**

Total percentage may be off due to rounding.

**Gender and Education**

With a relatively young and growing population, there is increased access to primary (elementary) and secondary (high) school education. Between 2001 and 2004, the national government built three high schools and six primary schools in the protected area (Thompson 2005). Thus, although only about 60% of the population age 60 and over attended or graduated primary school, 93% of the population that is age 59 and under have graduated or completed some years of primary school (Statistical Institute of Jamaica 2001a). Indeed, in 2000, the total number of high school graduates almost doubled the 1980 count (see Table 3.2). Further, the 2001 to 2004 number of high school graduates already exceeds 75% of the 1991 to 2000 number of graduates (see Table 3.2). Of note, for each decade since 1980, females account for more than half the number of

**Table 3.2**

The Population's High School Graduates and Gender Distribution The Negril Environmental Protection Area 1980, 1990, 2000 & 2001- 2004					
DECADE <sup>1</sup>	High School Graduates Male		High School Graduates Female		TOTAL
	Number	%	Number	%	
1980	3,670	46.3	4,256	53.70	7,926
1990	5,120	46.20	5,963	53.80	11,083
2000	6211	45.71	7376	54.29	13,587
2001- 2004	4,563	44.40	5,712	55.59	10,275

Sources:

Hanover: High/Secondary School Graduates, 1971-1980 (Government of Jamaica 1980a).

Hanover: High/Secondary School Graduates, 1981-1990 (Government of Jamaica 1990a).

Hanover: High School Graduates, 1991-2000 (Government of Jamaica 2000a).

Hanover: High School Graduates, 2001-2004 (Government of Jamaica 2005a).

Westmoreland: High/Secondary School Graduates, 1971-1980 (Government of Jamaica 1980c).

Westmoreland: High/Secondary School Graduates, 1981-1990 (Government of Jamaica 1990b).

Westmoreland: High School Graduates, 1991-2000 (Government of Jamaica 2000b).

Westmoreland: High School Graduates, 2001-2004 (Government of Jamaica 2005c).

Enumeration Map of western Jamaica (Statistical Institute of Jamaica 2005).

Notes:

1. Except for 2001-2004.

2. Each count is based on the number of students from the protection area.

3. The Ministry of Education disbanded the secondary school designation in favor of a two-tiered high school system in 1999 (The Government of Jamaica 1999).

high school graduates (see Table 3.2). Thus, in relatively younger households, females are likely to contribute a significant portion of the household income (Statistical Institute of Jamaica 2001).

### Landownership

Approximately 11% of the protected area's families own 80% of the freehold land that lies within the protected area (Hanover Parish Council 1992, 2001; Westmoreland Parish Council 1990, 2001).<sup>63</sup> Families with claim to the remaining freehold land do not hold title to these lands. Rather, they claim land use rights based on familial decent

<sup>63</sup> Land is held as Crown (government) land, freehold (private), or leasehold. Crown land accounts for almost 20% of Negril's terrestrial area. Local governments such as Parish Councils (similar to county governments in the United States but with a lot less autonomy) do not own land. Jamaican nationals have equal access to but must get legal permission to use crown land (Government of Jamaica 1994).

(Government of Jamaica 1994, Hanover Parish Council 2001, Westmoreland Parish Council 2001). These lands are rarely subdivided not only due to their lack of original title, but also due to the fear of restricted access to public services such as water and electricity (Government of Jamaica 1994). Thus, except for planned housing developments, most of the protected area's population resides on 'family land' measuring two hectares or less.<sup>64</sup>

#### SUMMARY

Negril's distinct physiographic features and its socioeconomic history have influenced its natural resource use. The fishing, sugar and tourism groups are each strategically positioned to make use of these resources. To date, their operations have provided jobs for Negril's changing populations. However, as the literature review suggests, on the implementation of industry-specific participatory-developed conservation policies, each group's natural resource use is likely to change and with that, changes in the available jobs.

Yet, Negril's demographic structure may very well be the conditioning factor of the implemented policies. First, the 21% increase in total population from 1991 to 2001 suggests that there is a significant number of people now living in the protected area. Much of this increase has occurred in the 20-29 and 30-39 age groups. Further, most are women. Second, the relative difference in the age structure and the education level of Negril's population are distinct from that which existed prior to the protected area designation.

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<sup>64</sup> Those that do not own land usually squat on public or Crown land or lease/rent 'house spots' from those that do (Government of Jamaica 1994).

Next, chapter four reviews the research questions, data and methodologies that are used in this dissertation. The chapter also examines the significance of the temporal and spatial scales that the research uses.

## **CHAPTER 4 THE METHODOLOGY**

This chapter introduces the research questions, and methodologies that underpin this dissertation. It has two major sections. The first reviews the research questions and examines the significance of applying multiple temporal and spatial scales to the research.<sup>65</sup> The second reintroduces each research question and identifies the data and methodologies that were used in the analysis. The chapter concludes with a summary of how the data and methodologies will answer the research question.

### THE RESEARCH QUESTIONS

This dissertation sought to determine the extent to which the participatory-planned conservation policies influenced changes in the Negril Environmental Protection Area's natural resource use from 1995 to 2005. According to much of the social science critique of protected areas, local populations' natural resource use changes once an area has been so designated. Critics find that these changes occur because the participatory-planned conservation policy framework increases the differentiation between social classes, and incorrectly assumes that local populations are homogeneous in their desire for conservation and development projects.

However, the political and socioeconomic conditions encountered in Negril suggested that the current participatory-planning conservation policy framework may

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<sup>65</sup> In geographic research, scale refers to the dimensions in time and space that a phenomenon or process is taking place (see Goodchild and Proctor 1997). Scale is critical to geographic research since a phenomenon or process that is observed in a particular time and/or space may be nonexistent at other such scales. To illustrate, Evans, Ostrom and Gibson (2003) research on the commons show significant disparities in the results of works conducted at multiple temporal and spatial scales in comparison to those conducted at static scales. Also, see Gibson, Ostrom, and Ahn (2000), Hudson (1992), Kremen et al. (2000) and McConnel (2002).



have very little influence on changes in natural resource use in protected areas that are dominated by colonial and postcolonial political and socioeconomic landscapes. Indeed, the interplay observed among the fishing, sugar and tourism groups suggested that socioeconomic policies and the relative power of groups were more likely to influence changes in natural resource use. Further, based on the differences and similarities observed among the fishing, sugar and tourism groups, group membership and demography are likely to influence the perception of conservation and of changes in natural resource in Negril.

One way of determining the extent to which the participatory-planned conservation policies could influence changes in the protected area's natural resource use was to examine the impact of the policies on the fishing, sugar and tourism groups' natural resource use. The fishing, sugar and tourism groups were ideal for this research because each offered a unique set of characteristics that distinguished it from the others with whom the conservation policies were likely to have had varying interaction(s). An examination of the three should therefore offer a more informed discussion on the primary research question.

In conducting this research, two major questions were asked:

#### Research Question 1

From 1995 to 2005, in what ways did the participatory-planned conservation policies influence changes in the fishing, sugar and tourism groups' natural resource use?

#### Research Question 2

How does group membership and demography influence the perception of the conservation policies and of changes in natural resource use?

## The Scale of the Research

As an open system, the protected area's policy environment shapes and is shaped by its interactions with historical or even more recent regional, national, and international political, and socioeconomic events. Thus, in answering the research questions, the geographic scales at which the analysis takes place are significant to one's understanding of the processes that are likely to have influenced changes in the protected area's natural resource use.

The use of multiple temporal and spatial scales is essential to the analysis of changes in the fishing, sugar and tourism groups' job availability since the research extended beyond Negril's geographic boundary to regional and national groups who were likely to have influenced the outcome of broadly conceived national and international conservation and development policies. Conducting the research at these scales allowed one to examine some of the more obvious indirect drivers of change (such as demographic changes and conservation and development policies) as well as the more subtle yet equally powerful ones (such as the relative power of industry-affiliated groups). The research spans the period 1990 to 2005.

### DATA AND METHODOLOGY

This section restates the research questions and describes the data and methodologies that were used as well as any significant limitations.

#### Research Question 1

From 1995 to 2005, in what ways did the participatory-planned conservation policies influence changes in the fishing, sugar and tourism groups' natural resource use? Since each group's operations were labor intensive, changes in natural resource use were measured in terms of changes in job availability.

## *Data and Methodology*

To answer this first question, the trends of key industry-specific operating ratios were analyzed. A content analysis was conducted to understand better the observed trends.

### Trend Analysis

For the fishing group, changes in the *number of canoes to the number of commercial fishermen ratio* were analyzed. Recall that canoes were major investments for fisher families. In general, one canoe served two fishermen.

The fishing group's data were acquired from the Negril Fishermen's Cooperative (NFC), and the Ministry of Agriculture, Fisheries Division in Kingston and Lances Bay, Hanover. While recognizing that there were limitations to this approach, to gather the most complete data set, the Negril Fishermen's Cooperative membership register and sales receipt books as well as each fishing village's 'headman's' list were used to determine the *number of commercial fishermen* and the *number of boats/canoes*. Whenever there were differences between the Fisheries Division's records and those of fishing villages, the more conservative data set was used.

Next, for the sugar group, changes in the number of 'regular' workers to hectares harvested were analyzed. Recall that, due to the labor-intensive nature of sugar cane farming, in general, farmers employed one 'regular' worker for every three hectares harvested. *Number of 'regular' workers* and the *number of hectares* were the total of those employed by large sugar cane farmers.<sup>66</sup> The variable *number of 'regular' workers*

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<sup>66</sup> The Sugar Company of Jamaica used the yearly amount of sugar cane production to distinguish between large and small farmers. For this research, large farmers were those that produce equal to or greater than 1,000 tonnes of sugar cane annually during the study period.

was used rather than ‘*number of workers*’ since most farmers preferred a permanent staffing structure to that of ‘temporary workers’ or ‘day laborers’ who were deemed to have less invested in a farm’s long term success.<sup>67</sup> The *number of ‘regular’ workers* was defined by the geographic location of affiliated sugar cane farms, and not each individual’s residential address. The sugar group’s data sets were acquired from the Sugar Company of Jamaica (Frome Division), the Sugar Industry Research Institute (Mandeville), and large sugar cane estates’ records.<sup>68</sup>

Lastly, changes in *number of hotel rooms* to the ‘*minimum’ number of workers ratio* were analyzed for the tourism group.<sup>69</sup> Recall that in general, the tourism group maintained a one room to one and a half workers ratio. Changes in this ratio then is indicative of overall changes in the level of job availability. The ‘*minimum’ number of workers* excluded non-accommodation workers such as cab drivers and non-hotel affiliated craft vendors.<sup>70</sup> This omission understated the tourism industry’s number of workers but did not affect the overall analysis. Both data sets were acquired from the Jamaica Tourist Board (JTB).

### The Content Analysis

To understand the likely causes of observed trends, a content analysis of the conservation and socioeconomic policies that were implemented during the study period was also conducted. Documents examined included laws, White Papers, Parliamentary

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<sup>67</sup> Recall that due to the general physiography of the protection area, from planting/replanting to harvesting, precise timed steps govern successful sugar cane farming. Reliable field workers are very important to the success of sugar cane farming in this region.

<sup>68</sup> Sugar farms that are included in the analysis are listed in the notes (Chapter 5).

<sup>69</sup> Recall that the ‘minimum’ number of workers is a conservative count of the number of people employed by the tourism group.

<sup>70</sup> The Planning Institute of Jamaica (PIOJ) estimates that an estimated three times the number of people reported as employed in the industry actually work in the industry. Most people that are omitted in national counts are employed as ‘unofficial’ tour guides, cab drivers, and ‘street side’ craft vendors (Planning Institute of Jamaica 2005).

Debates, Memorandums of Understandings between relevant government and non-government agencies, and conservation and fishing, sugar and tourism groups' annual reports, and the minutes of their Board of Directors' meetings.<sup>71</sup> In analyzing these documents, emphasis was placed on *the policies that were drafted, the rhetoric that underpinned those policies and the relative power of affiliated groups* that were charged with their implementation.<sup>72</sup> These documents were acquired from the Jamaica Information Service (JIS), the Planning Institute of Jamaica (PIOJ), the Urban Development Corporation (UDC), the Sugar Company of Jamaica (Frome) (SCJ), the Sugar Industry Research Institute (SIRI), the National Environment and Planning Agency (NEPA), the Negril Chamber of Commerce (NCC), the Negril Coral Reef Preservation Society (NCRPS), the Negril Environmental Protection Trust (NEPT), and the Negril-Green Island Area Local Planning Authority (NGIALPA).<sup>73</sup> The trend and content analyses are presented in Chapter 5.

### Research Question 2

How does demography or group membership influence the perception of conservation and changes in each group's job availability? Based on what is known about the fishing, sugar and tourism groups, the variables selected for analysis are *age, years of residency, family landownership, education, income, and gender*.

The null hypotheses are:

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<sup>71</sup> White papers are tabled proposals in various stages for procedural changes in industry or policy operations. Memorandums of Understandings are agreements between government and/or non governmental agencies on whose policies will guide particular projects.

<sup>72</sup> See Ley and Mountz.(2001) on infusing neutrality in content analysis.

<sup>73</sup> The National Environment and Planning Agency (NEPA) is the result of the 2001 merger between the Natural Resources Conservation Authority (NRCA), the Town and Planning Department (TPD) and the Land Development and Utilization Commission (LDUC). The National Environment and Planning Agency (NEPA) is a quasi government agency in the Ministry of Land and Environment and Jamaica's representative agency on conservation issues. In contrast, the Forestry Division in the Ministry of Agriculture is the definitive group and Jamaica's representative on land use/land cover issues.

1. Within each group, the perception of conservation does not vary according to age, years of residency, landownership, education, income, and/or gender (Question 3, Appendix A).
2. Among groups, the perception of conservation does not vary according to years of residency, landownership, education, income, and/or gender (Question 3, Appendix A).
3. Within each group, the perception of changes in each group's available jobs does not vary according to age, years of residency, landownership, education, income, and/or gender (Questions 20, 21, and 22, Appendix A).
4. Among groups, the perception of changes in each group's available jobs does not vary according to years of residency, landownership, education, income, and/or gender (Questions 20, 21, and 22, Appendix A).

### *Data and Methodology*

To test the hypotheses, a survey of the fishing, sugar and tourism groups' populations was conducted from June 2005 to August 2005, and the responses subjected to stepwise discriminant analysis. In addition, some survey respondents were subjected to follow up semi-structured interviews to provide additional clarification on the survey findings.

### The Sample Population

The most representative sample was selected from the fishing, tourism and sugar populations' edited lists.<sup>74</sup> For this research, Negril's fishing, tourism and sugar groups'

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<sup>74</sup> See Robinson (2001) on picking a quality sample population. See Bradburn, Sudman, and Wansick (2004) on mitigating problems involving population lists.

populations were defined as individuals who were closely associated with Negril's physical environment during the course of their work. Thus, the fishing population was defined as licensed and unlicensed commercial fishermen, as well as women that worked in village cook-shops. The list of licensed fishermen was from the Negril Fishermen's Cooperative, and the Ministry of Agriculture, Fisheries Division. Village fish catch log entries and village 'big men' were the primary source of unlicensed fishermen's names. As defined, the fishing group's population totaled 375 men and 31 women, and represented seven fishing villages.<sup>75</sup>

The sugar population was defined as independent sugar cane farmers, hoist and field workers that owned, operated and/or maintained farms within the protected area. The sugar cane farmers' population list was adjusted to eliminate farmers whose sugar cane fields were outside of the protected area's geographic boundary. Hoist workers from the Mint and Prospect Hoists and field workers from the large sugar estates within the protected area were added to the adjusted list.<sup>76</sup> As defined, the sugar group's population totaled 860 farmers and 899 field and hoist workers from the parishes of Hanover and Westmoreland. Of the total defined sugar population, 103 were women.<sup>77</sup>

Lastly, the tourism population was defined as tour bus operators, taxi drivers, hair braiders, craft vendors, water sports operators, housekeeping, and kitchen staff. The population list was derived from a national government worker population-location list received with significant use and reference restrictions. The list was amended to include

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<sup>75</sup> Recall that there are relatively very few women in the fishing industry.

<sup>76</sup> Mint and Prospect are the two hoists in the protected area that serves the Sugar Company of Jamaica (Frome Division). A hoist is a central weighing and batching station that prepares small farmers' sugar cane for receipt at the Frome Sugar Factory.

<sup>77</sup> Recall that there are relatively very few women in the protected area's sugar industry.

licensed taxi operators who serviced the Negril to Lucea, and Negril to Savanna-la-mar transportation routes; the Negril Chamber of Commerce Village Shoppes' craft vendors; the Negril Community Center's craft vendors; the Urban Development Corporation's (UDC) Rutland Point craft vendors; and 'independent' water sports' operators. As defined, the tourism population totaled 1,507 persons, of which 1,321 were women.

Based on the cost and the time available to complete the survey, a population sample size of 150 persons, with 50 each representing the fishing, sugar and tourism groups, was selected. Since the populations were not normally distributed, and the goal of the survey was to get the most accurate representative view of each population, disproportionate stratified random sampling based on group and then subgroup (gender, job classification, and geographic location in the protected area) representation was applied.

#### The Partially Closed-Ended Questionnaire (Appendix A)

Three primary goals were weighed in designing the appropriate questionnaire for the fishing, tourism and sugar populations. The first was to increase the survey response rate by minimizing the demand on respondents' time and efforts. The second was to minimize the time and expense of writing, conducting, and coding the survey questionnaire. Finally, the third was to write survey questions that were clear and concise. To satisfy these three goals, a partially closed-ended questionnaire was designed.<sup>78</sup> In designing this questionnaire, answer choices were provided but respondents could add the alternative 'Don't Know.'<sup>79</sup> Respondents also had the option of adding unlisted answer preferences

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<sup>78</sup> See Salant and Dillman (1994) for a complete review of partially closed-ended questionnaires.

<sup>79</sup> See Bradburn, Sudman, and Wansick (2004), Krosnick (1999), and Schuman and Presser (1996) on the use of 'Don't Know' as opinion filters in population survey questionnaires. Salant and Dillman (1994) note that when given this option, most respondents still select an answer from the other answer choices. Various reasons are given for this observation but one of the most prominent is heavily debated issues (such as



under ‘Other.’ A Likert scale was used to rank each answer choice. The survey questions were asked to first elicit the populations’ perception of conservation before introducing questions on the fishing, sugar and tourism groups. This approach to the question ordering aimed to minimize the populations’ transfer of their views of each group to their perception of the conservation policies.<sup>80</sup> Thirty-five questions, including six personal questions, were asked (see Appendix A).<sup>81</sup>

To test hypotheses one and two, question three asked, *how much do you think that the protected area’s policies have changed Negril’s environment?*<sup>82</sup> To test hypotheses three and four, questions 20, 21, and 22 asked, *what do you think about the changes in the [fishing, sugar or tourism] industry?* From the town hall meetings and the survey pretest, it was clear that one way in which the local population measured changes in Negril was in terms of changes in available jobs. The six personal questions asked determined each respondent’s *age, years of residency* in the protected area, *family landownership, education level, average monthly income, and gender.*

### The Completion of the Survey<sup>83</sup>

The population survey was conducted through personal interviews to increase the response rate, and to note potential candidates for follow up semi-structured interviews.<sup>84</sup>

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discussions on protected areas) is respondents’ desire to give a socially desirable answer or to satisfice. See Krosnick (1999) for discussions on social desirability and satisficing.

<sup>80</sup> Respondents completed the questionnaire in ink, and only eleven had changes in answer choices. Respondents made changes primarily on questions regarding the sugar group.

<sup>81</sup> Some of the survey questions asked will inform future research in Negril.

<sup>82</sup> Recall from the town hall meetings that, in general, the local population had a holistic view of Negril.

<sup>83</sup> A population survey pretest was conducted in March 2005 to test questionnaire and interview format.

<sup>84</sup> See Fowler (2001) for further discussion on the significance of response rates. Surveys by mail, telephone or in person yield varying response rates (see Fowler 2001, Frey 1989, Lavrakas 1993, Salant and Dillman 1994). Of the three considered, in-person interviews yield the best response rates. In person interviews usually cost more than mail or telephone surveys, however, the interviewer is on hand if there is need for

The risk of influencing answer choices through facial expression, body language or in just simply rereading or explaining a question or possible answer choice was minimized greatly with clear, concise questions.<sup>85</sup> With the help of Ornette Blair, an English Language lecturer at the University of the West Indies, the full survey was conducted between June 1 and August 10, 2005.<sup>86</sup>

### The Stepwise Discriminant Analyses

To test the hypotheses, Stepwise Discriminant Analyses were conducted on the responses to questions 3, 20, 21, and 22 (Appendix A). This use of Discriminant Analysis was limited to the *Tests of Equality of Group Means (The Analysis of Variance [ANOVA] Table)* and *The Classification Table* since both provided the information necessary to answer the research questions.

Discriminant analysis assumes a normal distribution that takes the form:

$$Z = b_1X_1+b_2X_2+b_3X_3\dots b_nX_n+c^{87}$$

Where  $Z$  = discriminant score

$b$  = discriminant weights

$X$  = predictor (independent) variables

$c$  = constant

(See Aaker, Kumar and Day 2001).

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question clarification (Fowler 2001). Further, in Jamaica, very few people would have responded to a phone survey, and virtually none would to a mailed survey.

<sup>85</sup> See Fowler (2001) for further discussion on minimizing interviewer influence on interviewees' responses.

<sup>86</sup> Mrs. Blair is an experienced interviewer with academic training in survey methodology, and experience conducting surveys on behalf of the Ministry of Education, Kingston, Jamaica. Like the researcher, Mrs. Blair, is from the protected area.

<sup>87</sup> However, violations of the normality assumption are not necessarily fatal to the analysis since several cross check methods are built into the discriminant model (see McLachlan 2004). SPSS automatically computes the discriminant score.

While discriminant analysis assumes a normal distribution, recall that the fishing, sugar and tourism populations are not normally distributed. However, discriminant analysis is not particularly sensitive to minor violations of the normality assumption (see Lachenbruch 1997). The best guide to the extent of data distortion is the percentage of correct classifications (*The Classification Table*). If the classification percentages are high for *a priori* group membership, the violations of assumption were not very harmful (Lachenbruch 1997).<sup>88</sup>

For research question 2, the discriminant analyses tested the hypotheses that based on the selected independent variables, group means are equal ( $H_o: \mu_A = \mu_B$ ) (see Aaker, Kumar and Day 2001). If group means are equal for hypotheses 1 and 3, then no independent variable significantly influenced differences within any group in their members' perception of conservation and of changes in the fishing, sugar and tourism groups' available jobs. If group means are equal for hypotheses 2 and 4, then regardless of group membership, no independent variable significantly influenced the perception of conservation and of changes in the fishing, sugar and tourism groups' available jobs.

Each discriminant analysis involved a two-step process. The first involved an F test (Wilks' lambda) which assessed if the discriminant model was significant. That is, it examined if there were differences within the groups (hypotheses 1 and 3) or among the groups (hypotheses 2 and 4), and which independent variable(s) was significant (see Aaker, Kumar and Day 2001, and Tabachnick and Fidell 2001). Second, if the F test showed significance, each independent variable was assessed to see which differed

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<sup>88</sup> Efforts to improve the data or use alternative formulas give only marginal improvements (Klecka 1980). For further discussion on the robustness of discriminant analysis, the built in methods of countering minor violations, and the use of alternative formulas, see Fung (1995), Klecka (1980) and Lachenbruch (1997)

significantly in mean within the groups (hypotheses 1 and 3) or among the groups (hypotheses 2 and 4).

For this research, variables with Wilks' lambda ( $\lambda$ ) greater than .50 were accepted as an indicator that groups were homogenous for the particular hypothesis.<sup>89</sup> Variables with Wilks' lambda ( $\lambda$ ) of .50 or less were accepted as evidence of significant differences within the groups (hypotheses 1 and 3) or among the groups (hypotheses 2 and 4) on the hypothesis being tested.

In the Statistical Package for the Social Sciences (SPSS) Version 14.0, this use of Wilks' lambda ( $\lambda$ ) is displayed in the *Tests of Equality of Group Means* or *ANOVA* table in the Discriminant Analysis output. The *ANOVA* table also included an F test, where a "Sig." p value < .05 meant that the discriminant model scores differentiated among the groups significantly better than chance (than a model with just the constant) (see McLachlan 2004).<sup>90</sup>

*The Classification Table* was used to assess the performance of the Discriminant Analysis (see McLachlan 2004). It is based on the deriving of classification scores for each observation (respondent), and the use of Mahalanobis distances and derived group centroids to assign observations. Each respondent's score is based on the significance of that respondent's independent variables (see McLachlan 2004).<sup>91</sup> In *The Classification Table*, the rows are the observed categories of the dependents and the columns are the predicted categories of the dependents (see McLachlan 2004). If the *a priori* group

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<sup>89</sup> Recall that Wilks' lambda ( $\lambda$ ) varies from zero to one for each independent variable, with zero meaning that group means differ significantly based on that variable, and one meaning that all group means are the same for that variable (Tabachnick and Fidell 2001).

<sup>90</sup>This latter test minimizes the probability of erroneously rejecting  $H_0$  (see McLachlan 2004).

<sup>91</sup> SPSS automatically computes these values.

members are correctly classified (that is if the prediction is perfect), all cases will lie on the diagonal. The percentage of cases on the diagonal is the percentage of correct classifications or the hit ratio (see McLachlan 2004). Note that the hit ratio should be compared not to zero but to the percent that would have been correctly classified by chance alone (see McLachlan 2004). Each classification result is cross-validated by using ‘leave-one-out classification.’ With ‘leave-one-out classification,’ the classification of each case is tested using a discriminant function based on all observations except the tested observation (see McLachlan 2004). This cross-validation method is thought to be representative of the classification results for the entire fishing, sugar, and tourism populations (see McLachlan 2004).

#### The Semi Structured Interviews

To understand better the results of the discriminant analyses, semi-structured interviews were conducted primarily on thirty-one randomly selected survey respondents. These thirty-one respondents were selected from the 94 survey interviewees who expressed an interest in participating in follow-up interviews. Snowball sampling was used to identify industry-specific interviewees whose knowledge was pertinent to the study but who were external to the sample population.<sup>92</sup> These interviews were conducted primarily to get clarification on sensitive issues. The semi-structured method of interviewing was used since one could control the direction of the interview while allowing interviewees to introduce potentially significant information that may not have

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<sup>92</sup>See Aaker, Kumar and Day’s (2001) theoretical discussion on the use and applicability of snowball sampling. Also, see Bolles (2006) on her use of snowball sampling in researching women’s work in Negril’s tourism industry.

been covered elsewhere.<sup>93</sup> The *basic* semi-structured interview questions were drawn from the population survey questionnaire. Additional questions were added during the interviews to clarify issues or to get respondents to elaborate on particular points that were raised.<sup>94</sup> Like the survey population, the semi-structured interview population spoke on the condition of anonymity.

#### THE LIMITATIONS OF THE DATA AND METHODOLOGY

Though extensive, the data and methodology have one major limitation. It is likely that records kept at the local level may not have been rigorously maintained. However, the survey and the semi-structured interviews should satisfy this limitation.

#### SUMMARY

This dissertation sought to determine the extent to which the participatory-planned conservation policies influenced changes in the Negril Environmental Protection Area's natural resource use from 1995 to 2005. One way of answering the research question was to examine the impact of the policies on the fishing, sugar and tourism group's natural resource use.<sup>95</sup> The fishing, sugar and tourism groups were ideal for this research because each offered a unique set of characteristics with which the conservation policies were likely to have had varying interaction(s). To conduct this research, two major questions were asked.

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<sup>93</sup>See Berg (2006) for a full discussion on the advantages and disadvantages of structured, semi structured and unstructured interviews. See Mohammad (2001) on how to minimize the researcher's influence on interviewee's position on issues.

<sup>94</sup> See Stonch (1998) for a discussion on using semi-structured interviews in her research on fishing and tourism in Hudson Bay, Honduras.

<sup>95</sup> Recall that while sugar cane farming is land extensive, the tourism and fishing groups require the use of the protected area's coastline.

First, from 1995 to 2005, in what ways did the participatory-developed conservation policies influence changes in the fishing, sugar and tourism groups' natural resource use? Since each group's operations were labor intensive, changes in natural resource use were measured in terms of changes in job availability.

To answer this first question, changes in *the canoe to fishermen* (the fishing group), *the number of 'regular' workers to hectares harvested* (the sugar group), and *the number of rooms to 'minimum' number of workers* (the tourism group) ratios were analyzed. To understand the likely causes of observed trends, a content analysis of the policies that were implemented during the study period was also conducted. Combined, these data and methodologies will show the changes in each group's available jobs during the study period and the policies that influenced them.

Second, how does demography or group membership influence the perception of conservation and of changes in each group's job availability? The independent variables selected for analysis were *age, years of residency, family landownership, education, income, and gender*. Based on the research question, four hypotheses were tested. A survey was conducted on a 150 randomly picked sample population with equal representation from the fishing, sugar and tourism groups and questions 3, 20, 21, and 22 were subjected to Stepwise Discriminant Analyses. In addition, semi-structured interviews of 31 randomly picked survey respondents were conducted to better understand the findings of each hypothesis tested.

Combined, the findings of both secondary research questions not only show the extent to which the participatory-developed conservation policies influenced changes in the protected area's natural resource use, but also they provide an insight into some of the

other systematic changes that have taken place that do influence the outcome of the participatory-planned conservation policy framework.

Next, Chapter 5 answers research question one by analyzing the findings of the trend and content analyses on changes in the fishing, sugar and tourism groups' available jobs. To answer research question 2, Chapter 6, analyses the results of the hypotheses tested. Chapter 7 summarizes the research and combines the findings of Chapters 5 and 6 to answer the overall dissertation research question.



**CHAPTER 5**  
**THE CHANGES IN THE FISHING, SUGAR AND TOURISM GROUPS’**  
**NATURAL RESOURCE USE**

This chapter analyzes the changes in the fishing, sugar and tourism groups’ natural resource use. Since the groups’ operations were labor intensive, changes in their natural resource use were measured in terms of changes in their available jobs. The chapter is divided into two major sections. The first analyses the changes in the fishing, sugar and tourism groups’ available jobs by analyzing changes in industry-specific operating ratios. The second analyzes the role that institutional capacity has played in influencing each group’s natural resource use. The two major factors that are discussed in this second section are the relative power of groups and the development of a strategic workforce. The chapter concludes with a summary of the findings.

**THE CHANGES IN THE FISHING, SUGAR AND TOURISM GROUPS’**  
**AVAILABLE JOBS**

To measure changes in the fishing, sugar and tourism groups’ available jobs, key industry-specific operating ratios were analyzed. For the fishing group, changes in the *number of canoes to number of commercial fishermen* ratio were analyzed. Recall that in general, the ratio is one canoe to two fishermen (1:2). Next, for the sugar group, changes in the *number of ‘regular’ workers to number of hectares harvested* ratio were analyzed. Recall that due to the labor-intensive nature of sugar cane farming, farmers generally employed one ‘regular’ worker for every three hectares harvested (1:3). The *number of ‘regular’ workers* and the *number of hectares* were the total of those employed by large sugar cane farmers. The Sugar Company of Jamaica (Frome Division) defined large sugar cane farmers as those that produced an average of over 1,000 metric tonnes of

sugar cane annually. During the study period, although eighteen farmers/estates satisfied that criterion, only twelve were located within the protected area's geographic boundary.<sup>96</sup> The *number of 'regular' workers* was defined as those that were employed by the twelve sugar cane farms/estates irrespective of each worker's residential address.<sup>97</sup> Finally, for the tourism group, changes in the *number of rooms to the 'minimum' number of workers* ratio were analyzed. Recall that in general, the tourism group maintained a one room to one and a half worker ratio (1: 1.5) to satisfy its goal of providing exemplary service to its clientele. The *'minimum' number of workers* excluded non-accommodation workers such as cab drivers and non-hotel affiliated craft vendors.<sup>98</sup> This omission understated the tourism group's 'minimum' number of workers but did not affect the overall analysis.

In addition, to understand the likely causes of observed trends, a content analysis of the policies that were implemented in the protected area during the study period was conducted. The documents analyzed included social, economic and environmental laws that governed operations within the protected area, Ministry Papers, Parliamentary Debates, Memorandum of Understandings, and conservation, fishing, sugar and tourism groups' Annual Reports and the minutes of their Board of Directors' meetings.

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<sup>96</sup> The twelve farms/estates are Barham Farm, Cleveland Bedassie, Buchanan Brothers, Ltd., Bull Head Farms, Frederick Miller, Mint, Orange Bay Sugar Estate/Sankar, Peggy Barry Farms, Ltd., Prospect Sugar Estate, Retreat, Ltd., John Salabie, and Daphne & Clement Tomlinson

<sup>97</sup> However, in general, workers lived on the sugar estates/farms or in very close proximity to individual farms (Harrison 1998).

<sup>98</sup> The Planning Institute of Jamaica (PIOJ) estimated that the tourism industry employed at least three times the number of people reported. The people that are omitted from the national count are usually employed as 'unofficial' tour guides, cab drivers, and 'street side' craft vendors (Planning Institute of Jamaica 2005).

## The Findings of the Trend and Content Analyses

Overall, the research found that from 1995 to 2005, although the fishing, sugar and tourism groups' available jobs changed, very little of these changes were due to the participatory-planned conservation policies. The content analysis finds that institutional capacity was the primary indirect driver of the changes observed. This analysis of the findings begins with the fishing group, and continues with the tourism, and finally, the sugar group. This discussion order best suits the interconnectedness of the policies that influenced changes in each group's available jobs.

### The Fishing Group

Overall, although the number of canoes and fishermen changed significantly, the trend analysis shows that these changes actually began prior to Negril's protected area designation.

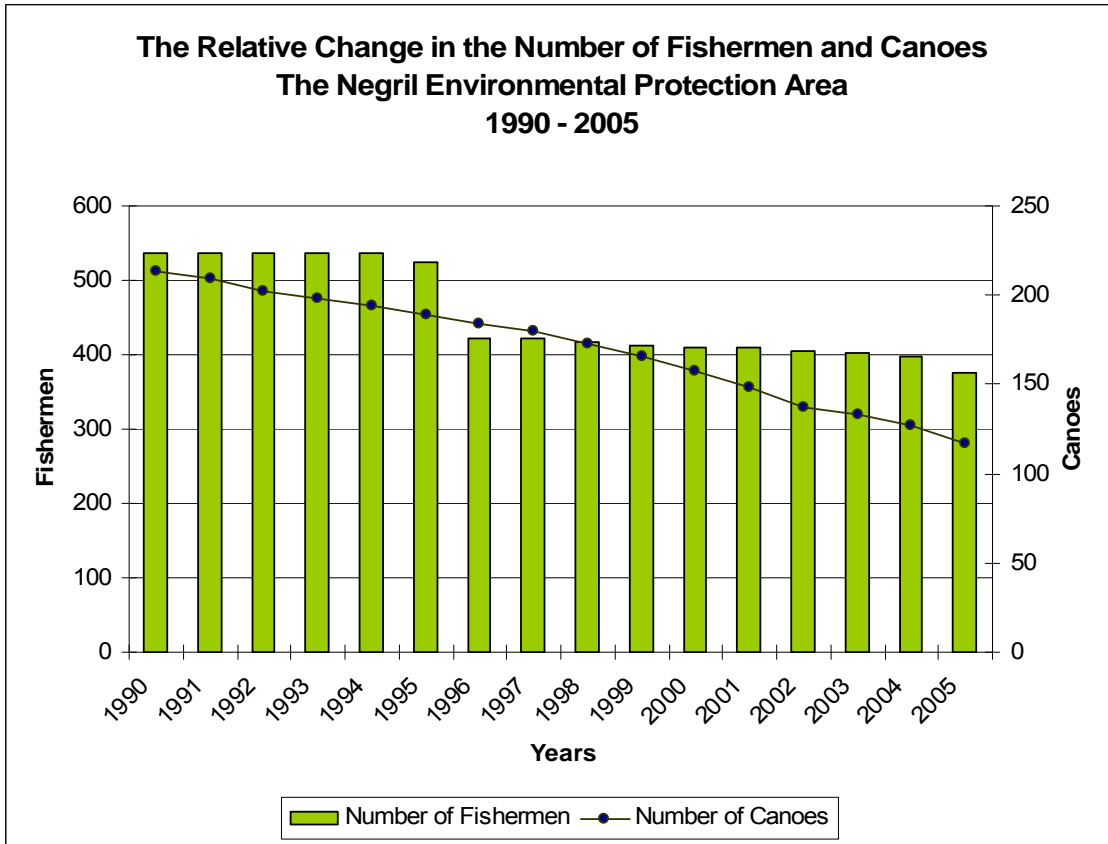
Between 1990 and 2005, *number of canoes* declined 42% from 210 to 120. However, Figure 5.1 shows that although the change began prior to 1995, the majority of the decline occurred after 1995. Similarly, between 1990 and 2005, the *number of fishermen* declined 23% from 510 to 390 with the majority of this change in number of fishermen occurring before 1995.<sup>99</sup> However, the relative decline in the number of canoes to the number of fishermen significantly altered the canoe to fishermen ratio from 1:2 to 1:3.5.

The relative change in the *canoe to fishermen ratio* is important because it not only suggests that fewer fisher families were investing in canoes, but also, and probably more

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<sup>99</sup> Although, some fishermen may have left the protected area's beaches independent of the protected area's policies, this tremendous decline is inconsistent with Negril's fishing culture of extended families (see Chapter 3). Also, see Christopherson, Homer and Grant (1997) for a detailed examination of the fisher culture in Negril.

Figure 5.1



Sources:  
The Ministry of Agriculture, Fisheries Division's Fishing Village Reports: 1990, 1993, 1995, 1997, 1999, 2002, 2003, and 2005.  
The Negril Fishermen's Cooperative Register, Annual Meeting: 1993 to 2005.  
Haughton, Orange Bay, South Negril River and Homer's Cove Fishing Village Records: 1990 to 2005.

importantly, it suggests that fewer families expected a long term family affiliation with the fishing industry.

The content analysis shows that the fishing industry-specific conservation policies were not the principal drivers of change in the canoe to fishermen ratio. While the conservation policies regulated the fishing equipment and fishing methods used in the

protected area, they did not restructure the fishing group's berthing rights or their access to the sea (see Government of Jamaica 1997b).<sup>100</sup>

From 1991 to 2001, the decline in the canoe to fishermen ratio mirrored the decline in the fishing group's access to the protected area's beaches as tourism development severely limited berthing access from Bloody Bay to West End (see Figures 5.2 and 5.3). In fact, throughout the study period, government approved construction notices and construction plans showed that the tourism group expanded along Negril's coast into areas that historically housed fishing villages (see the Commonwealth Secretariat 2000, the Urban Development Corporation 1994, the Urban Development Corporation and Design Collaborative 1982). Complaints filed with the Negril Chamber of Commerce, the Negril Coral Reef Preservation Society and the Negril Environmental Protection Trust noted that although tourism developers were not granted ownership of the beaches, many prevented the fishermen from coming ashore or berthing their canoes (The Negril Chamber of Commerce 1996, 1998, 2002; Negril Coral Reef Preservation Society, 2004, 2005; The Negril Environmental Protection Trust 1997, 1999, 2001, 2004).<sup>101</sup>

### The Tourism Group

Overall, in contrast to the decline in the fishing groups' available jobs, that of the tourism group increased significantly. The content analysis shows that tourism-oriented development policies influenced the number of available tourism jobs (see Urban Development Corporation 1994, Commonwealth Secretariat 2000).<sup>102</sup>

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<sup>100</sup> The fishing group's industry-specific policies incorporated the *Fisheries Act (1976)*, the *Wild Life Protection Act (1945)*, the *Watersheds Protection Act (1976)* and the *Beach Control Act (1956)* that stipulated approved fishing methods and equipment (see Government of Jamaica 1997b).

<sup>101</sup> These complaints underpinned the White Paper Document, *Towards a Beach Policy* (Government of Jamaica 1997c).

<sup>102</sup> Also, see Tulloch (1997, 1998), Simpson-Miller (2001, 2002), JAMPRESS (1990a, b), Phillip (1994), and the Organization of American States (1994).

Figure 5.2

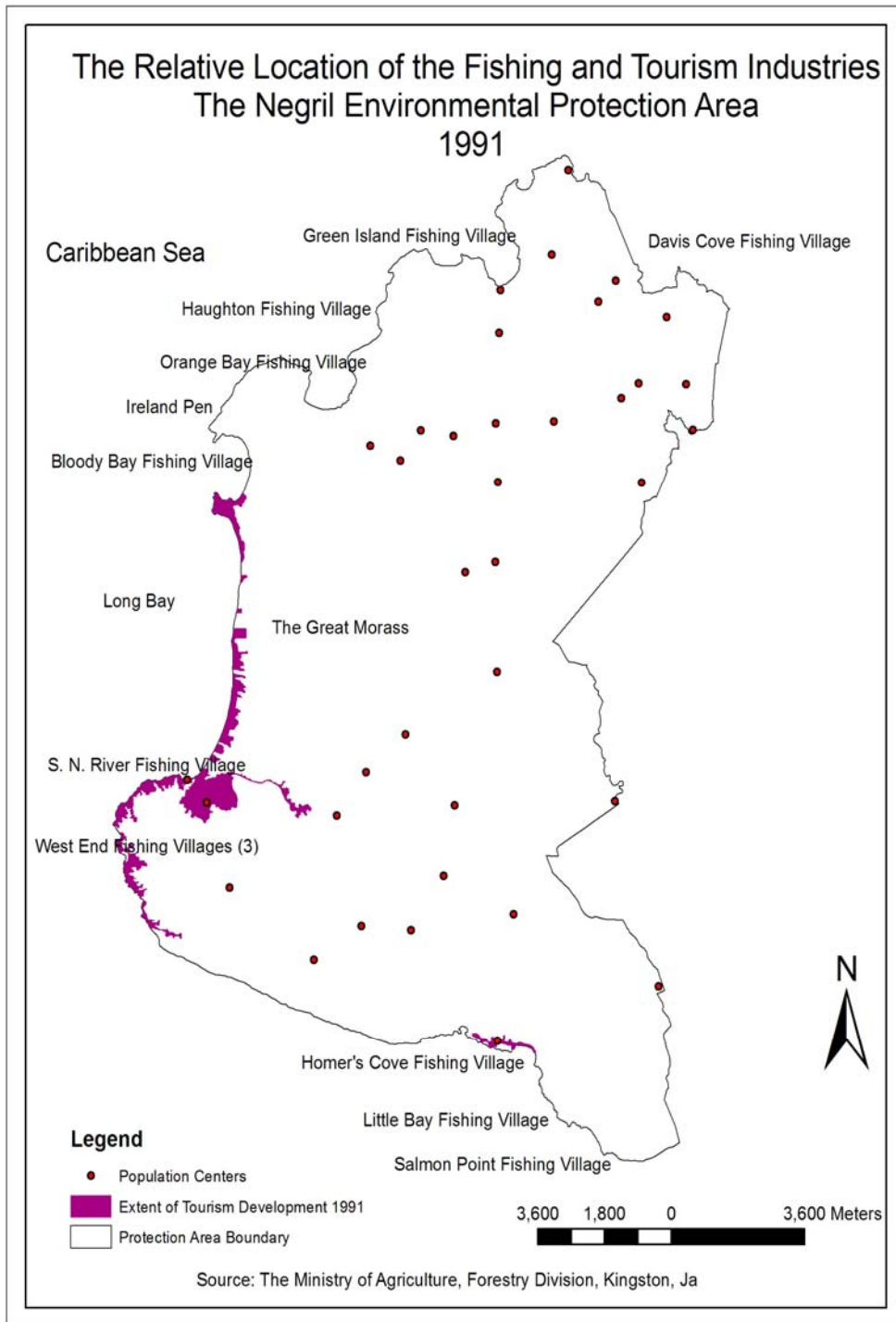
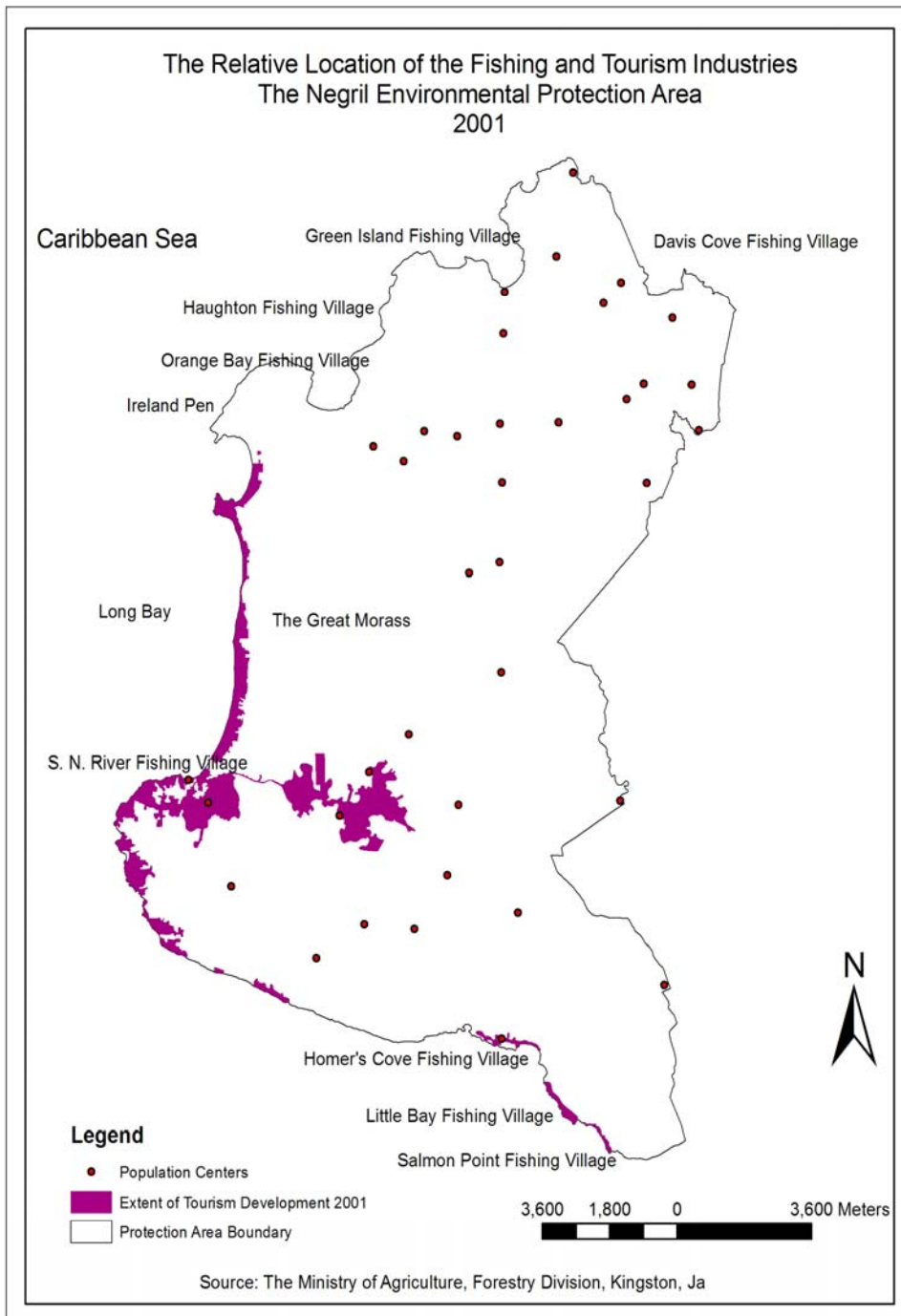


Figure 5.3



To illustrate, although the tourism industry-specific conservation policies implemented a moratorium on tourism related construction, from 1990 to 2005, number of rooms more than doubled from 2,300 to 6,200 with most of this increase occurring after 1995 (see Government of Jamaica 1997b). Further, much of the new rooms were built within 150 feet of high tide in clear violation of the second of the two major industry-specific conservation policies.<sup>103</sup>

Like the phenomenal increase in *number of rooms*, from 1990 to 2005, Negril's '*minimum*' *number of workers* increased from 4,113 to 11,475, with the majority of this increase occurring after 1995. More importantly, though, as number of rooms increased, the number of workers employed increased significantly, and thus throughout the study period, the room to worker ratio ranged from one room to 1.7 workers to one room to 1.8 workers (Figure 5.4). The tourism group's ability to exceed its one room to one and a half worker ratio is significant in that it suggests that throughout the study period, the group had access to a steady supply of qualified workers.

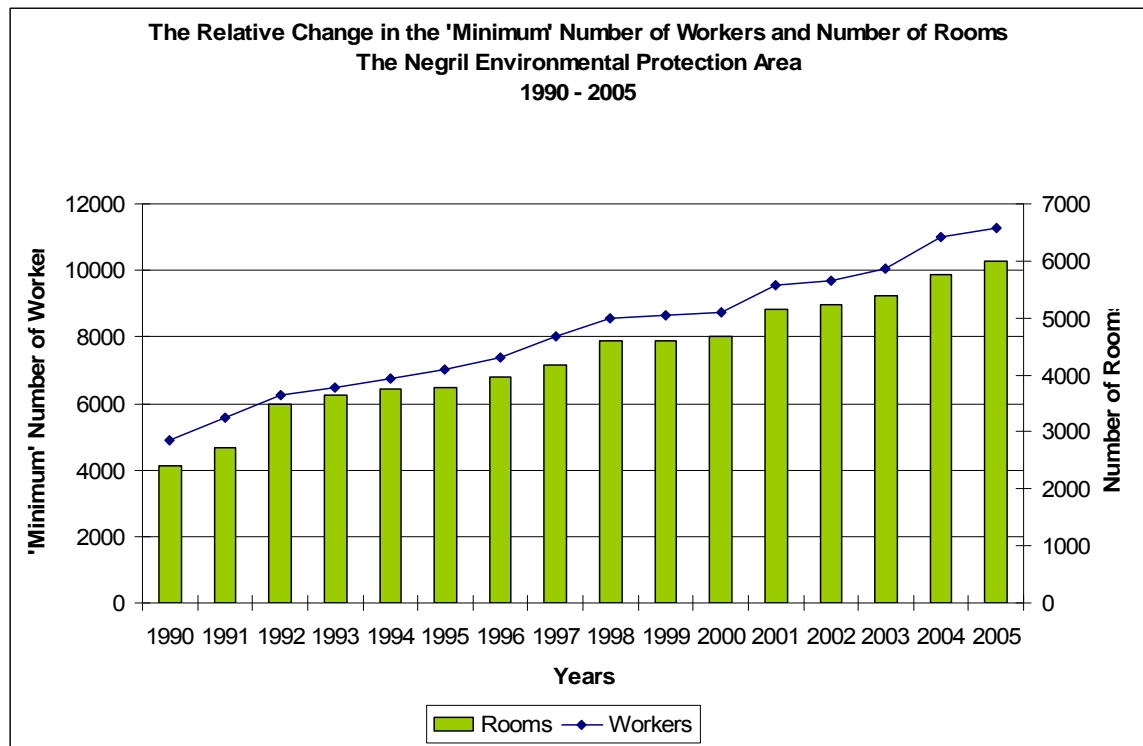
The content analysis finds that while the tourism industry-specific conservation policies were negated, two pre-existing socioeconomic/tourism development policies fueled much of Negril's tourism growth. For example, as part of a broader national tourism development plan, *The Hotel (Incentives) Act (1968)* and *The Resort (Incentives) Act (1971)* granted the protected area's hotel investors tax-exempt status on profit or gain

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<sup>103</sup> Under the *Beach Control Act (1956)*, and the *Negril Development Order (1984)*, the tourism industry-specific conservation policies blocked all construction within 150 feet of high tide and 100 feet from the main road. Second, they blocked the construction of any building that exceeded 15 habitable rooms per acre (Government of Jamaica 1956, 1997b; Negril Green Island Area Local Planning Authority 1984). Also, see Anonymous (2002a), Clarke (2003), C.L. Environment Company Limited (2001), Forest (1999), Haynes-Sutton (1999), Morris (1999) and Development International (UK) Limited (1999).



Figure 5.4



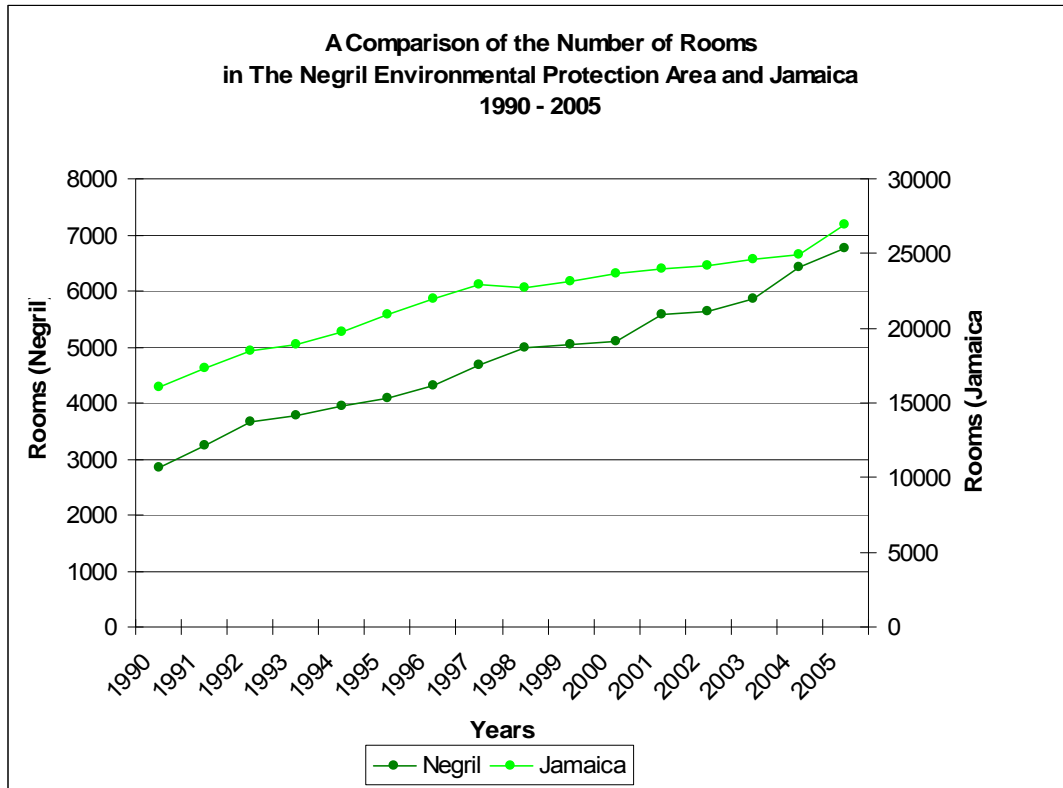
Source: The Jamaica Tourist Board Annual Reports, 1990 – 2005.

as well as duty free import of any equipment and materials necessary to operate a hotel for up to 10 years.<sup>104</sup> Further, to create a more accommodating environment for foreign investment, the national government guaranteed foreign investors a ‘one stop shop’ mechanism for acquiring land and securing the approval of all *Environmental Impact Assessments* necessary to build in Negril. This ‘one stop shop’ mechanism rested with Jamaica Promotions (the national government’s international marketing group), **the Urban Development Corporation** and the Ministry of Finance rather than the National

<sup>104</sup> In addition, for each exemption, the Minister of Tourism, at his or her discretion, could extend the exempt period from ten to fifteen years. Resort developers were granted similar concessions but with a seven year limitation on each. These Acts were even more powerful when grouped with the various versions of the *Caribbean Basin Initiative*. [The *Caribbean Basin Initiative* is the United States response to the impact of its declining sugar imports from Caribbean economies. The *Caribbean Basin Initiative* has the distinction of being the first broad based political, economic and social policy *ascribed* to the Caribbean Basin nations. Excluding Venezuela, Cuba and Mexico, it includes all countries bordering and within the Caribbean Sea. Countries remain a part of this pact if certain conditions are met (see Appendix C) (The *Caribbean Basin Economic Recovery Act of 1983*)].

Resources and Conservation Authority as required by law (see Commonwealth Secretariat 2001, Government of Jamaica 1991). The number of rooms and ‘minimum number of workers’ consistently equaling 20% or more of the national count is evidence of the success of these two major socioeconomic policies in Negril (see Figures 5.5 and 5.6).<sup>105</sup>

**Figure 5.5**



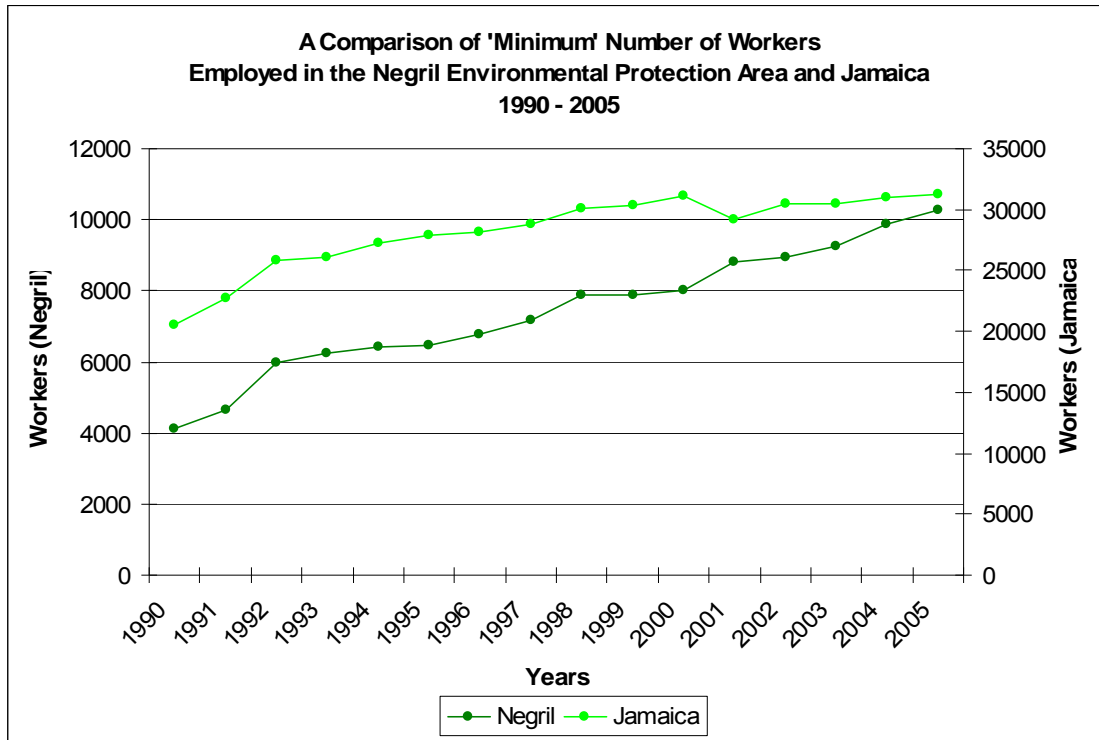
Source: The Jamaica Tourist Board Annual Reports 1990 – 2005.

### The Sugar Group

Overall, like the tourism group, between 1990 and 2005, the sugar group’s available jobs significantly increased. Again, the content analysis shows that this change was not due to the sugar industry-specific conservation policies but to changes in Negril’s

<sup>105</sup> Much of this change occurred in former fishing villages that were classified as fish nurseries (see Haynes-Sutton 1999, National Resource Conservation Authority, 1996, 1999 and Boyken Caribbean, LLC., 2003).

Figure 5.6

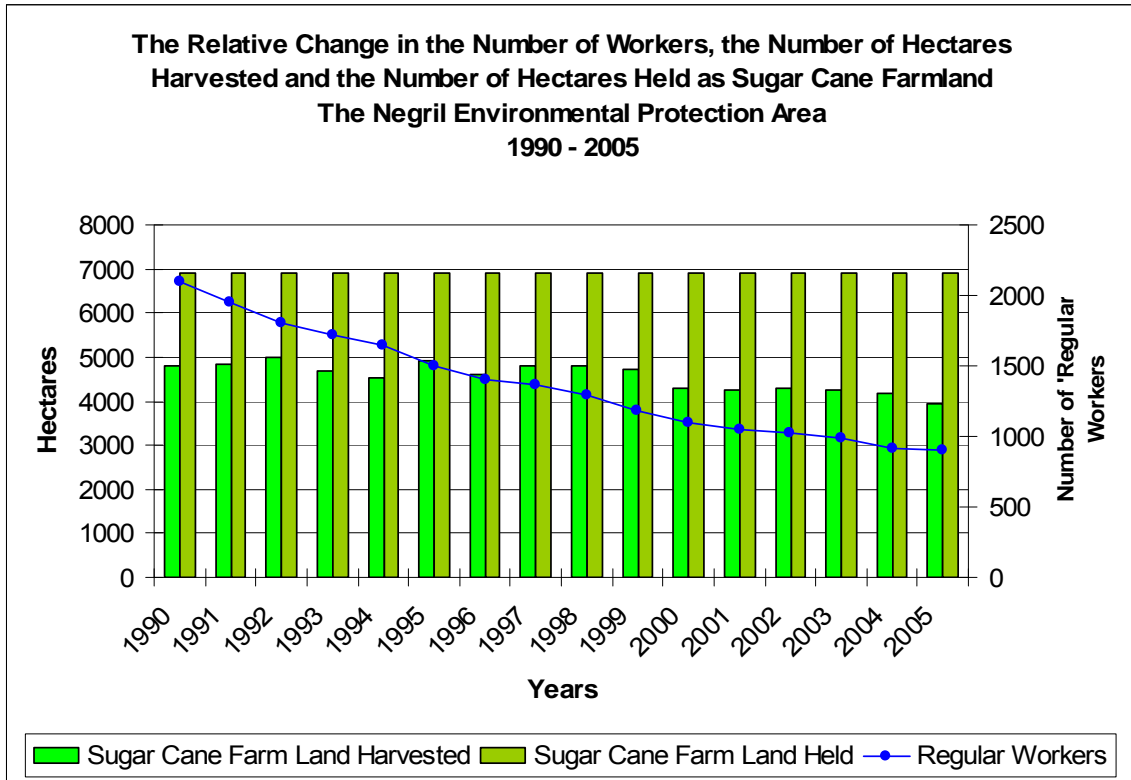


Source: The Jamaica Tourist Board Annual Reports 1990 – 2005.

demographic structure and the socioeconomic development policies that favored the tourism industry.

In general, from 1990 to 2005, the *number of hectares harvested* declined by 18% from 4,750 to 4,000 (Figure 5.7). In contrast, between 1990 and 2005, the *number of 'regular' workers* declined 60% from 2,250 to 901. Figure 5.7 shows that the decline in the number of 'regular' workers occurred at a much faster rate than that of hectares harvested. From 1990 to 2005, the number of 'regular' workers to number of hectares harvested ratio increased from one 'regular' worker to three hectares harvested (1:3) to one 'regular' worker to 6.1 hectares harvested (1:6.1).

Figure 5.7



Sources:

Barham Farm, Cleveland Bedassie, Buchanan Brothers, Ltd., Bull Head Farms, Frederick Miller, Mint, Orange Bay Sugar Estate/Sankar, Peggy Barry Farms, Ltd., Prospect Sugar Estate, Retreat, Ltd., John Salabie, and Daphne & Clement Tomlinson.

The Sugar Company of Jamaica (SCJ) (Frome) Cane Farmers' Register (1990 to 2005).

The Sugar Industry Research Institute (SIRI) Annual Reports (1990 to 2005).

Note:

1. A map of the protection area's enumeration districts and the Sugar Company of Jamaica's (Frome) Farmer' Payee Register were used to determine farm boundaries.
2. One hectare = 2.471 acres (US).

The All Island Sugar Cane Farmers' Annual Reports as well as the sugar cane estates' monthly reports chronicled the decline in the number of 'regular' workers to hectares harvested ratio. In general, each set of reports highlighted a significant increase in sugar cane spoilage due to insufficient 'regular' labor.<sup>106</sup> Each noted the difficulty in

<sup>106</sup> Recall that the use of temporary labor was extremely undesirable in the sugar industry since success was predicated on farm-specific sugar workers who were familiar with each farm's timed schedules, and whose family's economic future was intimately tied to that particular farm's economic success.

employing ‘regular’ workers since few people wanted to work in the sugar cane fields.<sup>107</sup> Thus, although the temporary workers’ records were relatively sparse, an examination of each estate’s employment list shows that their numbers and times employed more than tripled during the study period.<sup>108</sup>

The content analysis shows that although the conservation policies stipulated a 50% reduction in the amount of fertilizer, spectracide and herbicide used in sugar cane fields, the introduction of ‘natural’ fertilizers and pest control methods and crop types that were less susceptible to diseases, these policies were negated when principal leaders in the sugar group tabled alternative management approaches (see Government of Jamaica 1997b, Sugar Industry Research Institute 1996b). Further, during the study period, the national government maintained a two-pronged economic approach to protect the sugar group. The first of these two approaches ensured that the classification of sugar cane farmlands within the protected area remained inviolate, and the second guaranteed the sugar group an export market for its raw sugar at guaranteed prices.

To illustrate, in 1996, the national government passed the *National Land Policy* that made the protected area’s sugar cane farmlands relatively sacrosanct (see Government of Jamaica 1996).<sup>109</sup> Thus, though not solely intended for this purpose, under this policy, the protected area’s sugar cane farmers cannot be forced to convert sugar cane land to other uses (see Mullings 1994a, 1994b; H. Clarke 1996, Phillips 1994). To support this stipulation, the national government continued to grant sugar cane farmers subsidized

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<sup>107</sup> See the All Island Cane Farmers Association (1992, 1994, 1996, 1998, 2003, 2005), Prospect Sugar Holdings’ Field Reports (1995, 1998), and Winchester Sugar Estate Field Reports (2001, 2004).

<sup>108</sup>This audit was conducted on the twelve large sugar cane farms/estates in the protected area: Barham Farm, Cleveland Bedassie, Buchanan Brothers, Ltd., Bull Head Farms, Frederick Miller, Mint, Orange Bay Sugar Estate/Sankar, Peggy Barry Farms, Ltd., Prospect Sugar Estate, Retreat, Ltd., John Salabie, and Daphne & Clement Tomlinson.

<sup>109</sup> The *National Land Policy (1996)* structured the identification and titling of all land (Government of Jamaica 1996).

loans and unfettered access to the Sugar Industry Research Institute's reports on fertilizer, herbicide, and spectracide use as well as soil specific sugar cane varieties (R. Clarke 1998, Falloon 2004, Government of Jamaica 1996).<sup>110</sup>

The second economic approach that supported sugar in the protected area stemmed from the African, Caribbean, and Pacific Countries (ACP) Sugar Protocol (1974).<sup>111</sup> This protocol guaranteed the protected area's raw sugar duty free access to the European Union at guaranteed prices. From 1990 to 2005, this guaranteed price was the *intervention* (minimum) price paid to European Union sugar beet farmers (African, Caribbean, and Pacific Countries Sugar Protocol 1990, 1995, 2000; Official Journal C50 2.15.2001).<sup>112</sup> More importantly, though, during the study period, the guaranteed price for the protected area's raw sugar exceeded the World market price for refined sugar (Figure 5.8).

To understand the significance of this protocol to the protected area's sugar group, and to the nation, in general, consider that from 1990 to 2005, the protected area's raw sugar production, which averaged about one-third of the national total, earned 200% or more pounds sterling from the European Union that it would have earned if it was refined

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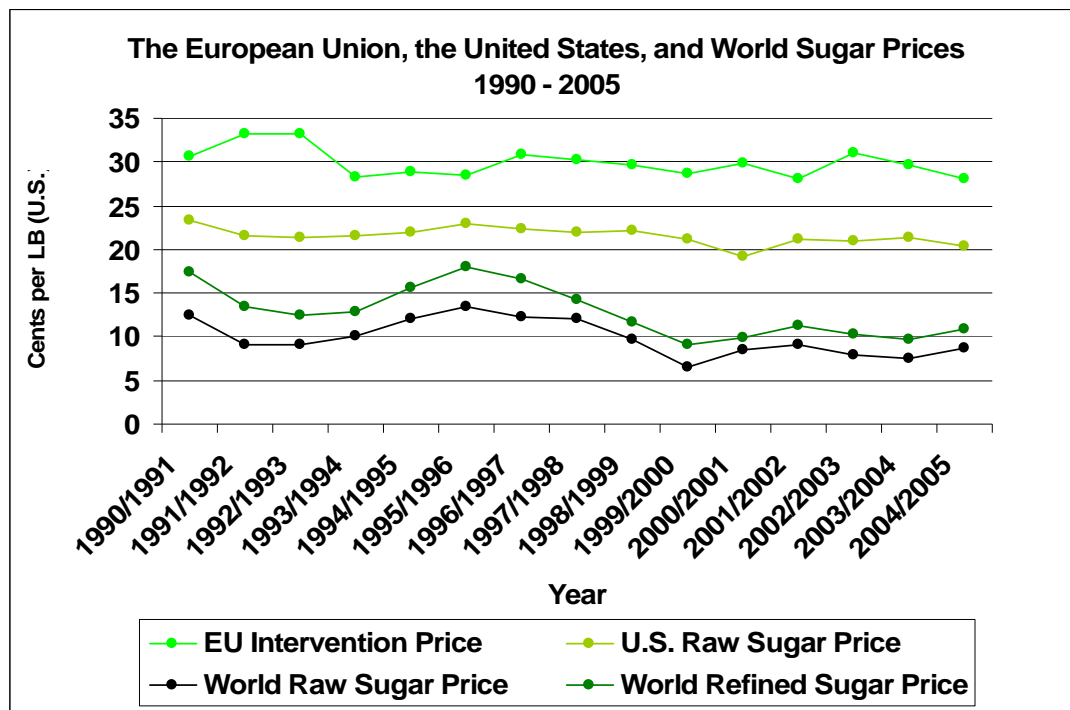
<sup>110</sup> Also, see Ferguson (2000), Gillette (1997), Reynolds (1991), C. Clarke (2004), H. Clarke (1995, 1996), R. Clarke (2001, 2002, 2003, 2004), O. Davis (1998, 1999, 2000, 2003, 2004, 2005), Clunis (2000), Hylton 1996, Laing (2005), Morals (2002), Mullings (1994a, b), Stair (1992, 2004), the All Island Cane Farmers Association 1990 to 2005 Annual Reports, and the Sugar Industry Research Institute 1990 to 2005 Annual Reports for detailed analysis and/or discussions on plans, distribution schedules, cane farmer responses, and the national government's policies.

<sup>111</sup> In acceding to the European Union, Great Britain negotiated a transfer of a percentage of its Common Organization of Markets (COM) approved sugar quota to its former sugar producing colonies. This side agreement between Britain, the rest of the EU and Britain's former sugar producing colonies is known as the *African, Caribbean, and Pacific (ACP) Countries Sugar Protocol (ACP 1974)*. The ACP Sugar Protocol is not a trade agreement (Official Journal L 308, 1967, Official Journal L 177, 1.7.1981). The subsequent renegotiated clauses that occur almost every five years require each ACP country's approval.

<sup>112</sup> The European Union's *intervention price* is the minimum price paid to European sugar beet farmers if the *basic* commissioned price falls below the sugar beet factory gate price in member countries. However, the factory gate prices in member states usually exceed the European Union's *intervention price*; thus, the *intervention price* is rarely triggered (Official Journal C 290, 7.11.1991; Official Journal C 50, 2.15.2001).

in Jamaica, and sold on the World Market (London Futures Market) (Figure 5.8, Appendices D, E and F).

**Figure 5.8**



Sources:

Eurostat – Basic Statistics of the European Union (various issues).

International Sugar Organization (ISO) Yearbook (various issues).

London Daily Price, Futures and Options Exchange, f.o.b. European ports, Contract No. 5.

New York Coffee, Sugar & Cocoa Exchange, Inc., Contract No. 11, f.o.b. Caribbean ports. New York

Coffee, Sugar & Cocoa Exchange, Inc., Contract No. 14, (before 1986, Contract

No. 12) c.i.f. duty/fee paid.

United States Department of Agriculture, Economic Research Services, Sugar and Sweetener Outlook and Situation Reports (various issues).

Notes:

1. The European Union price used is the intervention price since this is the price that the protected area's sugar earned during the study period. The Intervention price is set by the European Union's Common Organization of Markets for Sugar (COM). This price has been frozen at €631.90 (US\$792.21) per tonne for refined sugar, and €523.70 (approx US\$656.56) per tonne for raw sugar since 1993/1994.
2. European Union prices that are quoted in ecu/100kg and Euro/tonne were converted to U.S. cents per lb to conform to U.S. and World prices. Conversion rates: Eurostat – Basic Statistics of the European Union (various issues) & The Bank of Canada: *10 Year Rates Look Up*.
3. 1 tonne of sugar = 1,000 kg = 2,205 lbs of sugar.

Thus, in summary, the research finds that the changes in the fishing, sugar and tourism groups' available jobs were primarily due to the national socioeconomic policies

that were in place prior to the protected area designation as well as those that were implemented during the study period. However, as the social science critique finds, the ability of the sugar and tourism groups to gain or retain control of the protected area's natural resources depended on the extent to which they each had institutional capacity. Thus, the second major section of this chapter analyzes two ways in which the tourism group was able to build and maintain the institutional capacity necessary to dominate the use of the protected area's natural resources while the sugar group could not.

#### THE INTERPLAY AMONG THE FISHING, SUGAR AND TOURISM GROUPS

Between 1990 and 2005, rhetoric that emphasized the tourism group's relative importance to Jamaica's foreign debt obligations underpinned significant changes in the protected area's natural resource use (see Davis 2001, JAMPRESS 1990a, b; Simpson-Miller 2001, 2002). Two major factors facilitated these changes. The first, the relative power of the Urban Development Corporation, facilitated the tourism group's use of Negril's natural resources, and the second, the strategic development of the protected area's workforce, provided the tourism group with skilled labor. To understand the significance of these two factors to the tourism group's institutional capacity, each section includes a comparison of the similarities and differences of the tourism, sugar and fishing groups in this endeavor.

##### The Relative Power of the Urban Development Corporation

During the study period, the Urban Development Corporation successfully negated the tourism industry-specific conservation policies and facilitated the tourism group's expansion along Negril's seacoast by *acquiring* and parceling land for long-term tourism leases (the Urban Development Corporation 1994, the Commonwealth Secretariat



2000).<sup>113</sup> The Urban Development Corporation is a quasi national government agency that was designed to plan and implement structured urban growth primarily in urban areas of Jamaica. Its relative power is underpinned by the *Urban Development Act (1968)*, and successive opposing national governments' upholding of that law. Under this Act, the Urban Development Corporation could “*without prejudice, acquire, manage and dispose of land ...within or outside any designated area (Government of Jamaica 1968b, 2).*” Further, under this Act, it had the right to “carry on *any* business or undertaking for the development of *any* designated area... [and]...engage in *any* other activity designed to promote the development of *any* designated area (Government of Jamaica 1968b, 2).” Essentially, the *Urban Development Act (1968)* could negate any industry-specific conservation policy that countered any development plan that it proposed for Negril.

In contrast to the tourism group, the fishing group was unable to build similar institutional capacity. The Negril Fishermen's Cooperative and its diverse but dwindling constituents had no legal standing with which to challenge the infringement of tourism development into traditional fishing villages. The groups that were associated with the fishing group were primarily regulatory and not development focused.

However, like tourism, the sugar group had institutional capacity through its forward and backward linkages to the two major political parties, trade unions, rum distillers, food processors, and British refineries.<sup>114</sup> For example, when faced with closure during the

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<sup>113</sup> Long-term leases were for 99 years (The Urban Development Corporation 1982, 2004).

<sup>114</sup>The sugar group's backward and forward linkages are probably most telling in the following observances: 1) Although most Ministers of Parliament are reshuffled within the Jamaican Parliamentary Cabinet every two or three years, those that command the Ministry of Agriculture usually go unchanged for much longer periods. During the study period, all Ministers of Agriculture were directly affiliated with various aspects of the national sugar industry (Jamaica Information Service 1992, 1996, 2000, 2004), 2) From 1993 to 1999, J. Wray and Nephew, Limited, renowned distiller of Jamaica's international award winning rums, and Tate and Lyle, British sugarcane refiner and the former two-time owner/manager of Frome Sugar Estates, joined with Manufacturers Investments to assume temporary management of Frome

study period, various consortium of ownerships, comprised of national distillers, refiners and bankers, alternatively invested millions of dollars in the protected area's sugar group (Davis, O. 1998).<sup>115</sup> Yet, unlike tourism, the sugar group could not capitalize on this capacity to maintain or increase its natural resource use. The availability of an appropriate workforce was one major factor that influenced this difference between these two groups.

### The Strategic Development of the Protected Area's Workforce

The introduction of tourism at all levels of the education curricula created a workforce that satisfied two significant demands of the tourism group. The first was the creation of a mentally conditioned tourism workforce, and the other was a guaranteed supply of tourism workers. Training for work in the tourism industry followed two approaches. The first focused on the development of a workforce from infancy and was thus a part of the primary, secondary and trade school curricula. This approach emphasized the importance of tourism to Jamaica, and Jamaicans' obligation to be accommodating to foreigners "who are the lifeblood of the tourism industry (JAMPRESS LTD., 1990)." The second approach seek to counter negative feelings that 'the tourist is always right' as well as 'skin teeth,' one major form of resistance encountered in Negril's tourism industry. To achieve this latter goal, the Tourism Product Development Company

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Sugar Estates within the protected area. This act prevented the demise of the protected area's sugar base, and allowed the national government time to re-organize the government-controlled portion of the industry as a quasi government corporation (Davis 1998). Of equal importance, this temporary partnership gave the national government leverage in its meeting with the World Trade Organization, the United States, Brazil and Australia on the language of the African, Caribbean, and Pacific Countries Sugar Protocol in 1999 (see also, Tortello 2002 and Walker 2004).

held various mandatory workshops before issuing licenses or work permits to various categories of workers (see Simpson-Miller 2001).

In contrast to the tourism group, there was no targeted workforce development for the fishing and sugar groups. In fact, while fishing was not a part of schools' curricula, elementary schools' discussions on work in sugar cane fields centered on its historical ties to slavery and colonialism, and the success of Jamaica's national heroes in rebelling against those institutions. At higher levels of education, the foci were on management studies in soil conservation, and crop yield improvements. None of these foci prepared students to be field workers.

#### SUMMARY AND CONCLUSIONS

Between 1990 and 2005, the fishing, sugar and tourism groups' available jobs changed as their natural resource use changed. These changes were primarily due to the groups' ability to create and maintain institutional capacity. The trend analysis shows that while the fishing group's available jobs declined, those of the sugar and tourism groups increased significantly. However, in contrast to the tourism group, the increase in the sugar group's available jobs was due to fewer people wanting to work in the sugar cane fields. For tourism, the phenomenal growth in the number of new rooms increased its available jobs as it maintained a 1 room to 1.8 workers ratio for much of the study period. Figures 5.9 and 5.10 show the relative difference in geographic space that each group occupied in 1991 and in 2001, respectively.<sup>116</sup> It is clear from both maps that from 1991

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<sup>116</sup> Note the explanation on each map for the sugar group since the geographic areas occupied by sugar cane fields are distorted due to the time of year that the original images were taken. The geographic area occupied by sugar cane fields was unchanged during the study period.

The 1991 Geographic Information System (GIS) shape files and accompanying attribute tables were from the 1991 classified aerial photograph series, *Negril and its environs*, and those of 2001 from the 2001 IKONOS image of the protection area. Jamaica's existing land use classification was used to label the

to 2001, the fishermen's coastal access declined significantly. In 1991, Negril's fishermen could access five sixth of the protected area's coastline, and two third of its seven miles of beaches (Figure 5.9). Recall that since Negril's southwest coast is primarily coral cliffs and its northern coast consists of marshes and mangrove forests, berthing areas are predominantly in Davis Cove, Green Island, from Haughton (excluding the outcropping of coral cliffs at Ireland Pen) to the beginning of West End, Homer's Cove, Little Bay and Salmon Point (Figures 5.9 and 5.10). By 2001, the fishing group's 1991 access declined to just one-half the coastline and one-third the extent of the beaches

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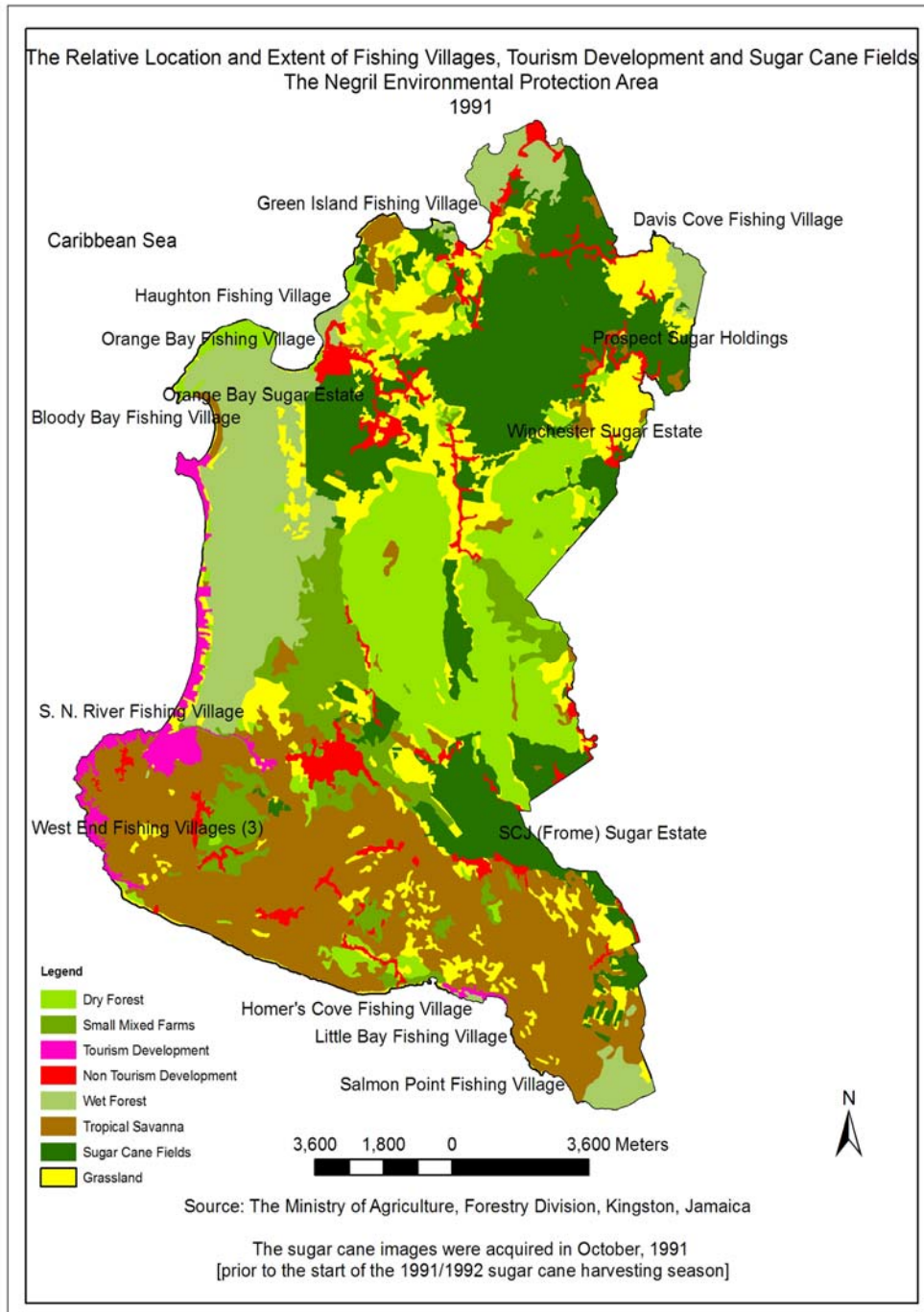
derived shape files. Jamaica's current land use classification builds on that which existed prior to its 1962 independence from Great Britain. Thus, pre-independence land use codes (such as sugar cane farms: 21) are kept, and newer codes were added as land use became more diverse. The protected area's geographic boundary, soils, and watersheds' shape files were from the Ministry of Agriculture, Forestry Division. The derived 1991 and 2001 shape files were clipped to the protected area's legal boundary to delimit the spatial analysis of changes in each group's geographic area.

The aerial photographs are taken at a scale of 1:15,000 while the IKONOS image is done at a scale of 1:5,000. The Ministry of Agriculture, Forestry Division made both sets of images available for use in this research. The Forestry Division is the Food and Agriculture Organization's (FAO) source for country (Jamaica) data as well as that for the United Nations Environment Programme (UNEP) and the World Conservation Union or International Union for Conservation of Nature (IUCN). In fact, the FAO corrected its country assessment for the Caribbean nations based on the Forestry Division's critique of its methods (see Evelyn and Camirand. 2000). The FAO has now adopted Evelyn and Camirand's (2000) proposed method for assessing land cover in the Caribbean.

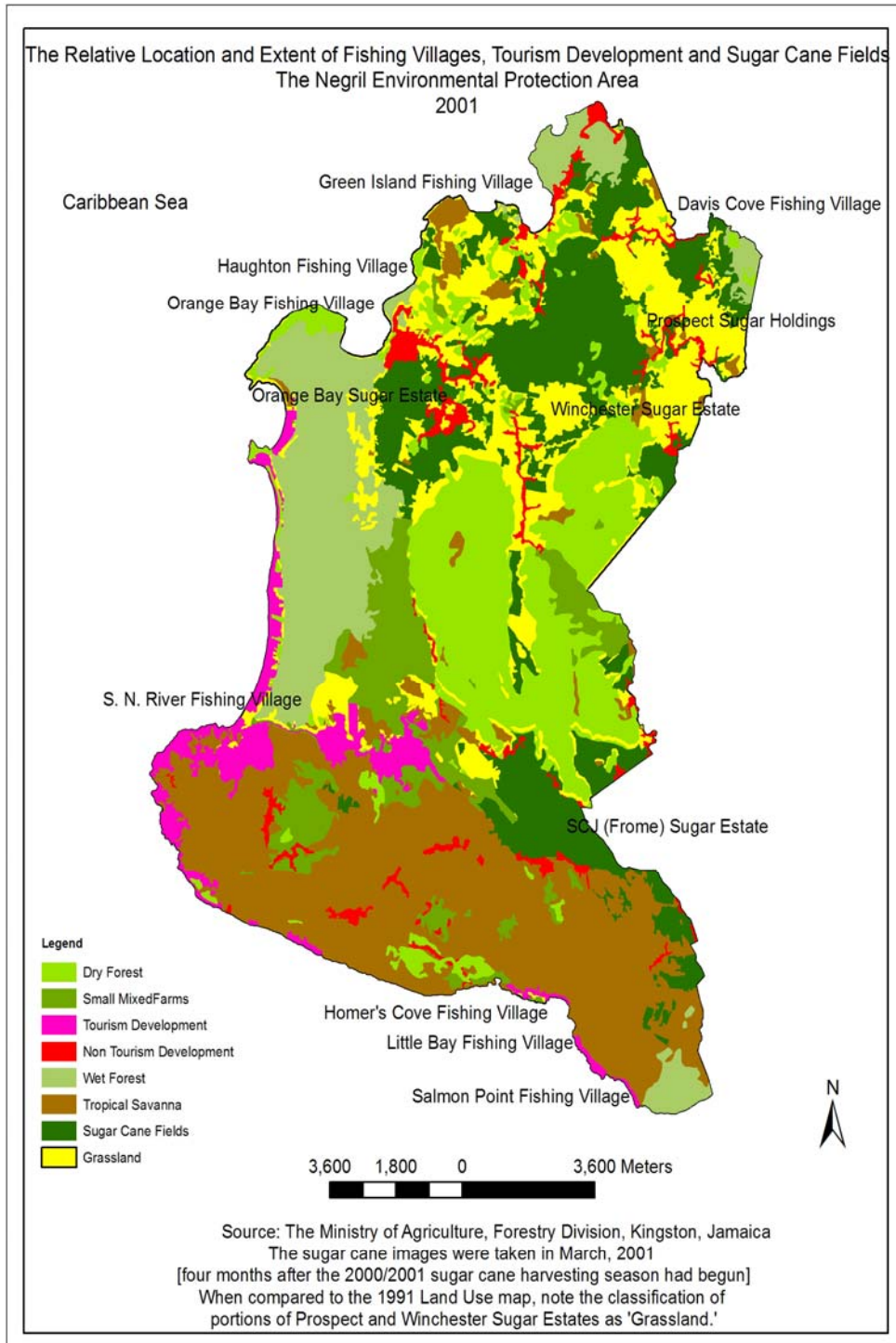
Prior to classification, the digitized aerial photographs and the IKONOS image were re-projected using Lambert Conformal Conic Projection (based on WGS84). [The Lambert Conformal Conic Projection is the most widely used by Caribbean countries in areal measurement or representation because it minimizes area and distance distortions. Traditionally, each Caribbean country uses locally developed datums based on Clarke 1866 and later, Clarke 1880. In general, each now uses local datums based on WGS84 or WGS84 itself.] The interpretation of the aerial photographs is based on the Canadian International Development Agency's *Trees for Tomorrow Project*. [The Trees for Tomorrow Project is a joint project between the Jamaican and Canadian Governments. The principal activities of this project include the Canadians providing the Forestry Division with technical assistance in staff training, and the drafting of a new forest policy.]

I elected to create Geographic Information System shape files from the 1991 images rather than those that could have been derived from the 1990 available Landsat image because there is significant cloud cover on the latter. Free Landsat images on western Jamaica for 1970, 1990, and 2000 were available at Landsat.org.

Figure 5.9



**Figure 5.10**



(Figure 5.10). Much of the decline occurred in Bloody Bay, Long Bay, and West End (Figures 5.9 and 5.10).

In contrast, in 1991, resort development occupied one sixth of the protected area's coastline, and about one-third of its seven miles of beaches (Figure 5.9). By 2001, tourism development dominated one-half the coastline, and two-thirds of the total extent of the beaches. Further, it now replaced residences inland along the Negril-Sheffield Main Road, and the interior of West End (Figure 5.10). Due to the relatively low-keyed style of bungalows in Negril Hills, Figure 5.10 does not fully capture the resort development that existed along the south west coast from West End midway to Homer's Cove. Overall, from 1991 to 2001, the Hanover and Westmoreland Parish Councils' tax records showed that resort development tripled to almost 40% percent of Negril's most valuable lands (Hanover Parish Council 1991, 2001; Westmoreland Parish Council 1991, 2001) (Figures 5.9 and 5.10).

In closing, institutional capacity and demographic changes have not only influenced the protected area's natural resource use, but also they have solidified the tourism group's interest in terms of natural resource use and labor. Chapter six presents the results of the population survey that was conducted on the fishing, sugar and tourism populations from June 2005 to August 2005. The research sought to determine how *age, years of residency, average monthly income, education level, family landownership, and gender* influenced the perception of conservation and of changes in the protected area's natural resource use.

**CHAPTER 6**  
**THE PERCEPTION OF CONSERVATION AND OF CHANGES**  
**IN THE FISHING, SUGAR AND TOURISM GROUPS' AVAILABLE JOBS**

This chapter answers the second research question that asks how demography or group membership influences the perception of changes in the fishing, sugar and tourism groups' natural resource use. Again, because each group's economic operations are labor intensive, changes in each group's natural resource use are measured in terms of changes in the available jobs.

The chapter has one major section that presents the fishing, sugar and tourism groups' population survey results. The section has two subsections. The first analyzes the perception of conservation and the second, the perception of the changes in each group's available jobs. *Age, years of residency, family landownership, education level, average monthly income, and gender* are the independent variables used in each subsection. Each subsection concludes with summary discussions that are informed by the semi-structured interviews. The chapter concludes with a summary of the findings and their implications for the conservation of the protected area's natural resources.

THE FISHING, SUGAR AND TOURISM POPULATIONS' SURVEY RESULTS

Overall, 134 of the 150 respondents (89%) completed the survey. Of the 134 respondents, 46, 45, and 43 represented the fishing, sugar, and tourism groups, respectively. Surveys were completed in pen as requested. Nine questionnaires had corrections in reference to respondents' perception of changes in the sugar industry (Q 21, Appendix A). Each change involved a one-point difference on the Likert scale. For example, question 21 asked how respondents perceived changes in the sugar industry. One respondent changed the answer to this question from *somewhat declined* to *declined*.



## The Perception of Conservation

Hypotheses one and two tested the *within* and *among* groups' perception of conservation, respectively. A combined discussion of the results follows the findings of hypothesis two.

Hypothesis 1: Within each group, the perception of conservation does not vary according to age, years of residency, landownership, education, income, and/or gender (Question 3, Appendix A). Based on the survey responses, a group is homogenous if 90% or more of its members' responses are within the boundaries of the group centroid (that is, if based on each independent variable, 90% or more are correctly classified to their *a priori* group based on that group's centroid for an independent variable) (see Question 3, Appendix A). One discriminant analysis was conducted for each group.

### *The Findings*

With a confidence interval of over 90%, the discriminant analyses found that unlike the tourism group, the fishing and sugar groups were homogeneous on the perception of conservation. For example, although the fishing group's members differed in their perception of conservation, none of the independent variables *significantly* explained the differences among members who indicated that the conservation polices had initiated *no change* in Negril to those who indicated that they had *somewhat improved* Negril (see Table 6.1, Figure 6.1, and Appendix H, Tables A1 to A2).<sup>117</sup>

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<sup>117</sup> Recall from the Town Hall Meetings that the population has a holistic perception of Negril. Thus with reference to 'Negril' respondents are usually referring to the physical and human environment.

**Table 6.1**

THE PERCEPTION OF CONSERVATION THE TEST OF EQUALITY OF GROUP MEANS FOR TOURISM RESPONDENTS ONLY					
	Wilks' Lambda	F	df1 <sup>1</sup>	df2 <sup>2</sup>	Sig.
YRSRES	.375	48.267	1	41	.000
EDUC	.589	15.376	1	41	.134
LAND	.638	14.258	1	41	.178
INCOME	.660	13.160	1	41	.183
AGE	.781	8.026	1	41	.238
GENDER	.966	.913	1	41	.475

Source:

The SPSS Stepwise Discriminant Analysis on Question 3's Tourism respondents' answers (Appendix A: The Conservation and Development Population Survey).

Notes:

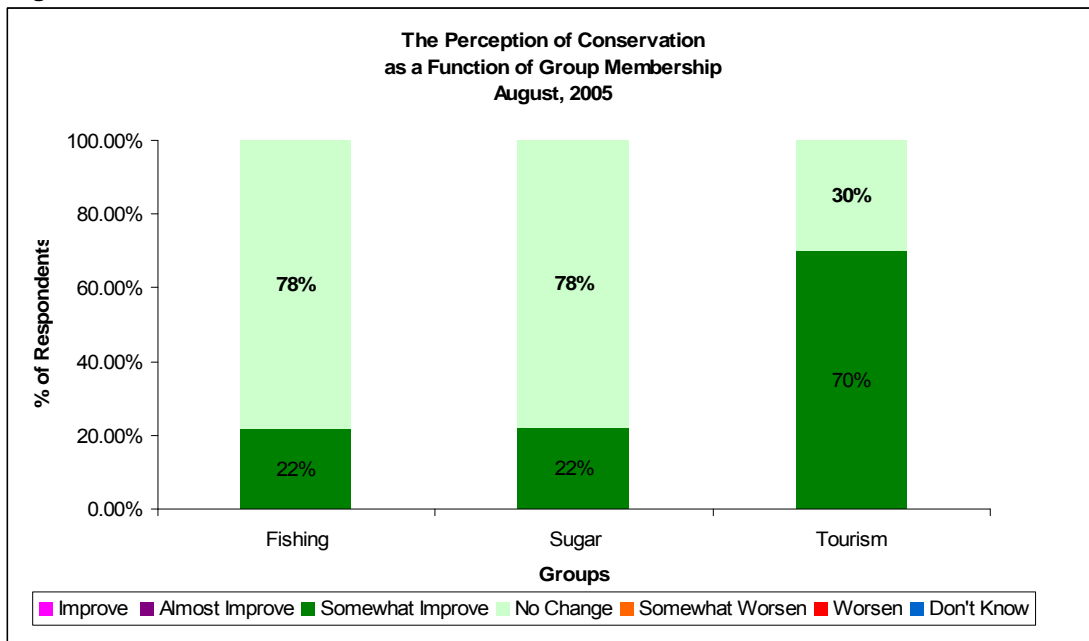
The maximum significance of F to enter for each variable is .05.

The maximum significance of F to remove for each variable is .10.

1 Recall that  $df1 = m - 1$ , where  $m$  is the number of groups, or in this case, sub groups.

2. Recall that  $df2 = p - m$ , where  $p$  is the number of predictor variables and  $m$  is the number of groups (or sub-groups).

**Figure 6.1**



Source: The Conservation and Development Population Survey (Question 3, Appendix A).

Note: The results are accurate to within a 94% confidence interval.

**Table 6.2**

THE PERCEPTION OF CONSERVATION THE RECLASSIFICATION OF <i>a priori</i> TOURISM RESPONDENTS BASED ON YEARS OF RESIDENCY					
GROUPS			PREDICTED GROUP MEMBERSHIP BASED ON ANSWER CHOICE		
			NO CHANGE	SOMEWHAT IMPROVED	TOTAL
ORIGINAL <sup>1</sup>	COUNT	NO CHANGE	38	1	39
		SOMEWHAT IMPROVED	0	4	4
	PERCENT	NO CHANGE	97	3	100
		SOMEWHAT IMPROVED	0	100	100
CROSS- VALIDATED <sup>2</sup>	COUNT	NO CHANGE	38	1	39
		SOMEWHAT IMPROVED	0	4	4
	PERCENT	NO CHANGE	97	3	100
		SOMEWHAT IMPROVED	0	100	100

Source:

The SPSS Stepwise Discriminant Analysis of **Tourism Respondents'** answers to Question 3 (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 97% of original grouped cases correctly classified.
2. 97% of cross-validated cases correctly classified.

In contrast, based on the F test, and Wilks' lambda of .375, *years of residency* was a significant difference *within* the tourism group on the perception of conservation (Table 6.1). Table 6.2 shows that based on the relative strength of *years of residency* as a discriminator *within* the tourism group, 97% of those members who thought that the policies had made *no change* in Negril were correctly classified, and of those who thought that it had *somewhat improved* Negril, 100% were correctly classified.

Hypothesis 2: Among groups, the perception of conservation does not vary according to years of residency, landownership, education, income, and/or gender. One discriminant analysis was conducted to test this hypothesis.

### *The Findings*

With a confidence interval of over 90%, the discriminant analysis found that regardless of group membership, *years of residency*, and to a lesser extent, *education*, significantly influenced the perception of conservation in Negril (Table 6.3).

With Wilks' lambda of .442, *years of residency* triggered entrenched classification of the sugar (96%) and fishing (94%) groups (Table 6.4). In contrast, only 88% of the tourism group was correctly classified. Figure 6.2 shows that, in general, respondents who have lived 15 years or more in the protected area had a negative perception of conservation while those who have lived less than 15 years had a positive perception of conservation.

**Table 6.3**

THE PERCEPTION OF CONSERVATION THE TEST OF EQUALITY OF GROUP MEANS FOR <i>a priori</i> <b>FISHING, SUGAR AND TOURISM RESPONDENTS</b>					
	Wilks' Lambda	F	df1	df2	Sig.
YRSRES	.442	32.267	2	131	.000
EDUC	.474	28.376	2	131	.000
LAND	.638	14.258	2	131	.000
INCOME	.660	13.160	2	131	.000
AGE	.781	7.196	2	131	.000
GENDER	.966	.913	2	131	.475

Source:

The SPSS Stepwise Discriminant Analysis on Question 3's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. The maximum significance of F to enter for each variable is .05.
2. The maximum significance of F to remove for each variable is .10.

**Table 6.4**

THE PERCEPTION OF CONSERVATION THE RECLASSIFICATION OF <i>a priori</i> FISHING, SUGAR AND TOURISM GROUP MEMBERS BASED ON <b>YEARS OF RESIDENCY</b>						
			PREDICTED GROUP MEMBERSHIP			TOTAL
			FISHING	SUGAR	TOURISM	
ORIGINAL <sup>1</sup>	COUNT	FISHING	43	3	0	46
		SUGAR	2	43	0	45
		TOURISM	5	0	38	43
	PERCENT	FISHING	93	7	0	100
		SUGAR	4	96	0	100
		TOURISM	12	0	88	100
CROSS- VALIDATED <sup>2</sup>	COUNT	FISHING	43	3	0	46
		SUGAR	2	43	0	45
		TOURISM	5	0	38	43
	PERCENT	FISHING	93	7	0	100
		SUGAR	4	96	0	100
		TOURISM	12	0	88	100

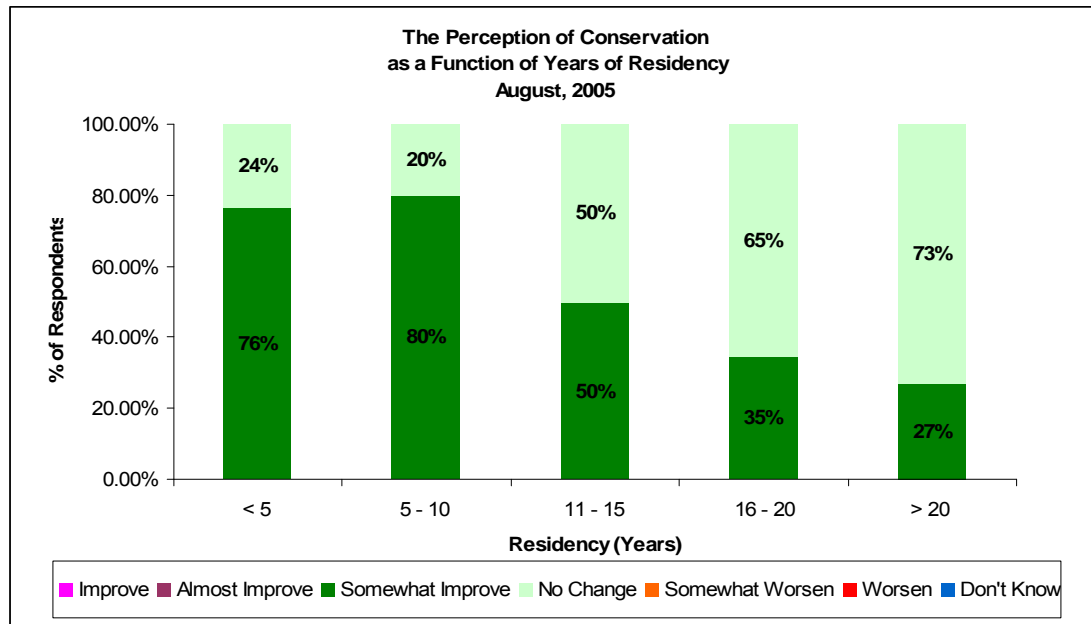
Source:

The SPSS Stepwise Discriminant Analysis on Question 3's responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 93% of original grouped cases correctly classified.
2. 93% of cross-validated cases correctly classified.

**Figure 6.2**



Source: The Conservation and Development Population Survey (Appendix A, Question 3).

Note: The results are accurate to within a 94% confidence interval.

Second, regardless of group membership, with combined Wilks' lambda of .474, based on both *years of residency* and *education level*, the fishing (98%) and sugar (98%) groups were similarly grounded in their perception of conservation (Table 6.5). However, again, the tourism group (81%) was transient in its views. Figure 6.3 shows that respondents who were secondary/trade school graduates had a positive perception of conservation while those at all other levels of education had a negative perception of conservation.

**Table 6.5**

THE PERCEPTION OF CONSERVATION THE RECLASSIFICATION OF <i>a priori</i> GROUP MEMBERS BASED ON YEARS OF RESIDENCY and <b>EDUCATION LEVEL</b>						
GROUPS			PREDICTED GROUP MEMBERSHIP			TOTAL
			FISHING	SUGAR	TOURISM	
ORIGINAL <sup>1</sup>	COUNT	FISHING	45	1	0	46
		SUGAR	1	44	0	45
		TOURISM	0	8	35	43
	PERCENT	FISHING	98	2	0	100
		SUGAR	2	98	0	100
		TOURISM	0	19	81	100
CROSS-VALIDATED <sup>2</sup>	COUNT	FISHING	44	1	1	46
		SUGAR	1	44	0	45
		TOURISM	1	7	35	43
	PERCENT	FISHING	96	2	2	100
		SUGAR	2	98	0	100
		TOURISM	2	16	81	100

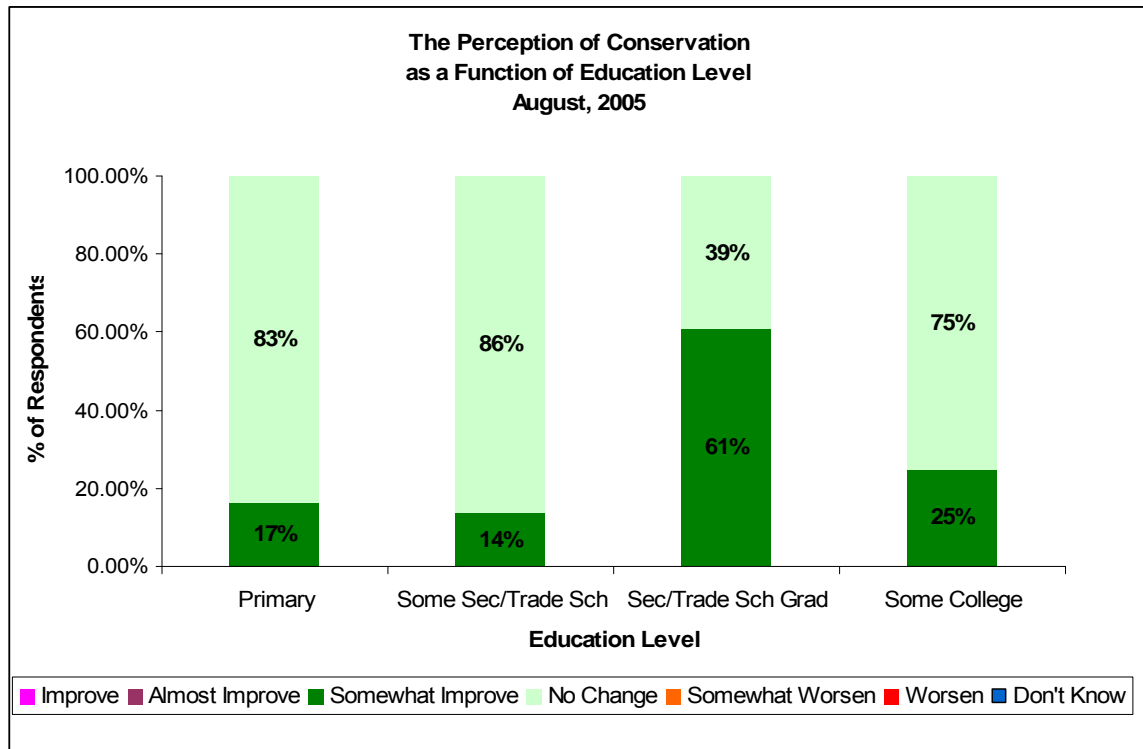
Source:

The SPSS Stepwise Discriminant Analysis on Question 3's responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 93% of original grouped cases correctly classified.
2. 92% of cross-validated cases correctly classified.

**Figure 6.3**



Source: The Conservation and Development Population Survey (Appendix A, Question 3).  
Note: The results are accurate to within a 94% confidence interval.

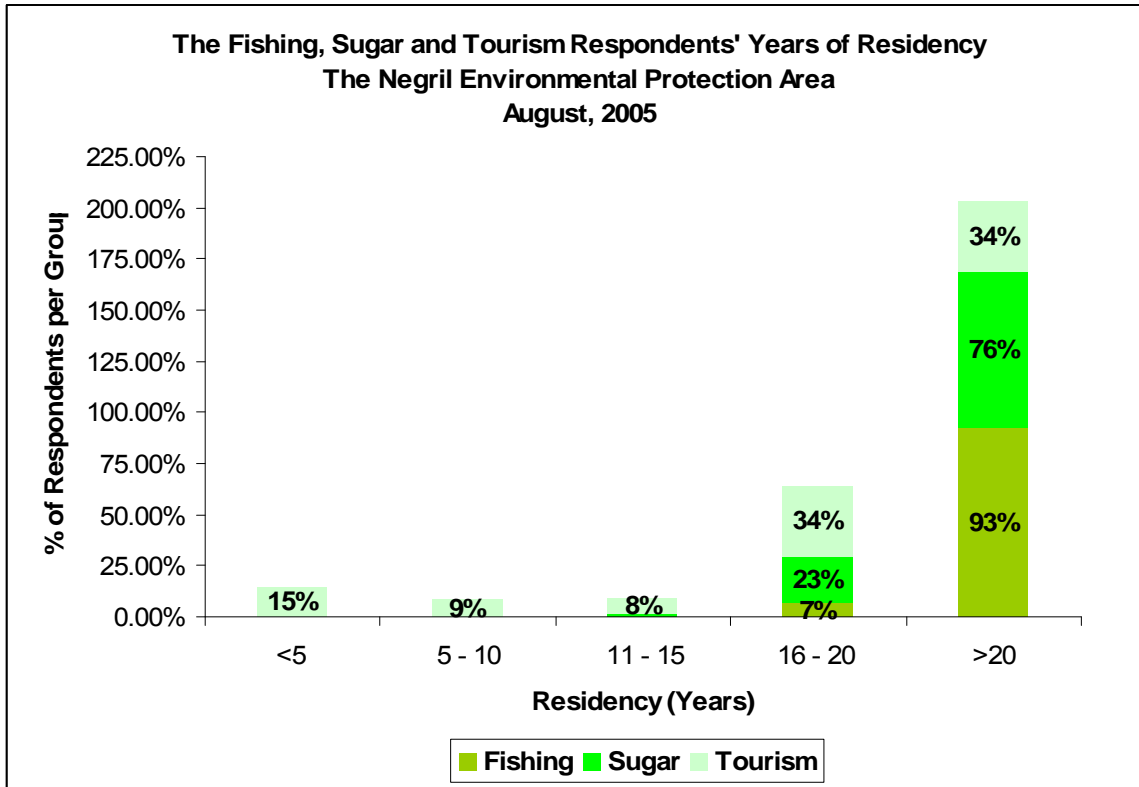
### The Perception of Conservation *Within* and *Among* Groups

With a confidence interval of more than 90%, *years of residency*, and to a lesser extent, *education*, were the most important independent variables that influenced the perception of conservation in Negril.

The research finds that, in general, respondents who have lived more than fifteen years in the protected area had a negative perception of conservation. Thus, they believed that the conservation policies had had no impact on Negril. In contrast, those who have lived fifteen years or less had a positive perception of conservation. Thus, these respondents believed that the conservation policies had somewhat improved Negril. Figure 6.4 shows that respondents who have lived more than fifteen years in the protected area were primarily from the fishing and sugar groups while the majority of those who have lived

fifteen years or less represented the tourism group. Throughout the semi-structured interviews, the significance of *years of residency* in influencing the perception of conservation was very evident.

**Figure 6.4**



Source: The Conservation and Development Population Survey (Appendix A, Personal Question 2).

In general, the fishing, sugar and tourism group members who have lived more than fifteen years in the protected area thought that the conservation policies had had *no impact* on the protected area since the sugar and tourism groups repeatedly ignored them. Some of the respondents who shared that view pointed to the continued ‘dumping’ of the coastal wetlands to facilitate tourism growth, and the continued use of spectracide and herbicide in the sugar cane fields as reasons for their opinion. Others pointed to the ‘bait-and-switch’ technique used to remove fishermen from beach areas for conservation purposes, and the almost immediate development of those areas into five star hotels.



Farmers, in general, noted that the source points for the Negril and Green Island Watersheds' environmental problems are outside of the protected area where tributaries leading to the watershed have been rerouted to drain chicken farms before being redirected towards the watersheds. In general, farmers noted that they were using less fertilizers, spectracides and herbicides because the reduction in the number of regular workers had severely limited their employment of sugar cane lands.

Like the sugar cane farmers, the fishermen viewed the conservation policies as pointless at this stage of Negril's economic development. In general, each of the ten interviewees who represented the fishing group thought that the degradation of the Negril and Green Island Watersheds was a result of the infrastructural changes made to accommodate tourism. Fishermen talked about the rerouting of rivers and the drainage of the wetlands in the 1960s and 1970s as reasons for their views.

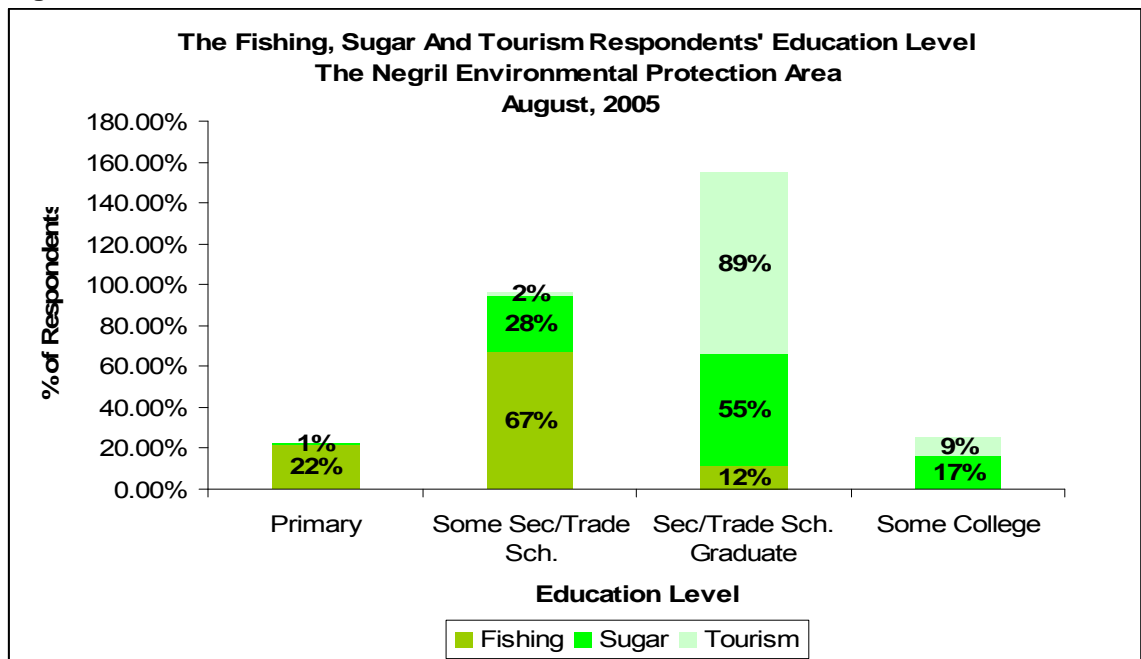
Lastly, in general, tourism respondents who have lived in the protected area fifteen years or less had a positive perception of conservation. In general, they thought that the conservation policies had somewhat improved Negril since there was increased dialogue on issues ranging from recycling to the development of a centralized sewerage system. In fact, they argued that with this foundation, Negril's conservation proponents could gain ground in the battle to conserve the watersheds.

Overall, to a lesser extent, *education's* influence on the perception of conservation was similar to *years of residency*. Most, secondary/trade school graduates positively viewed conservation in Negril while respondents at all other education levels had a negative perception of conservation. Yet, as Figure 6.5 shows, secondary/trade school graduates were primarily tourism respondents who would have been exposed to

conservation policies in the general academic curricula. In contrast, respondents with *primary, some secondary* and *some college* education were primarily associated with the fishing and sugar groups. These respondents were relatively older and would not have been exposed to the current curricula (see Chapter 3).

The homogeneity of the sugar and fishing groups on the perception of conservation was evident in their strong convictions on conservation based on *years of residency* or *education*. In contrast, long-term tourism residents who shared the fishing and sugar groups' perception of conservation provide evidence for the heterogeneity of the tourism group. One major factor that might have contributed to this commonality among sugar, fishing and long-term tourism respondents was that most long-term tourism respondents were former fishermen who capitalized on the early growth of tourism.

**Figure 6.5**



Source: The Conservation and Development Population Survey (Appendix A, Personal Question 4).

## The Perception of Changes in the Fishing, Sugar and Tourism Groups' Available Jobs

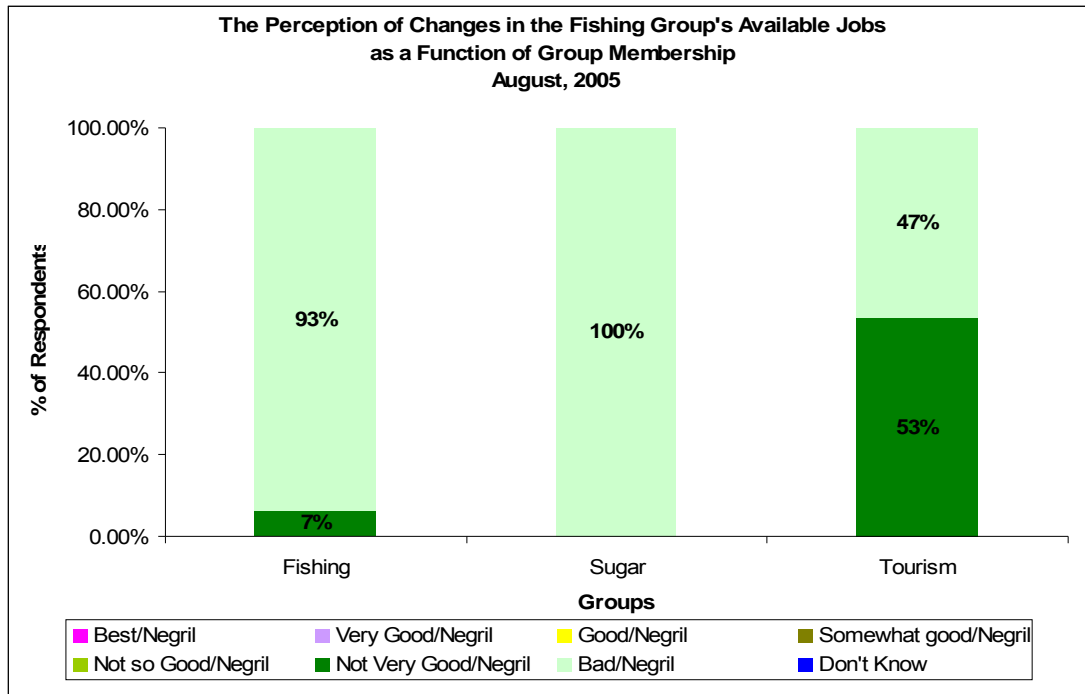
Because hypotheses three and four test the perception of changes in each group's available jobs, a combined discussion of their results follows the results of hypothesis four.

Hypothesis 3: Within each group, the perception of changes in each group's available jobs does not vary according to age, years of residency, landownership, education, income, and/or gender (Question 20, 21, 22, Appendix A). Again, based on the survey responses, a group is homogenous if 90% or more of its members' responses are within the boundaries of the group centroid (that is if 90% or more are correctly classified to their *a priori* group) (see Questions 20, 21, and 22, Appendix A). Nine discriminant analyses were conducted to test this hypothesis.

### *The Findings*

With a confidence interval of over 90%, the discriminant analyses found that no independent variable *significantly* differed within any of the groups on the perception of changes in the fishing group's available jobs (see Appendix H, Tables A3 to A4). In general, each group of respondents had a negative perception of changes in the fishing group's job availability. Figure 6.6 shows that the majority of the fishing and sugar respondents thought that the changes were *bad for Negril* while the majority of the tourism respondents thought that they were *not very good for Negril*.

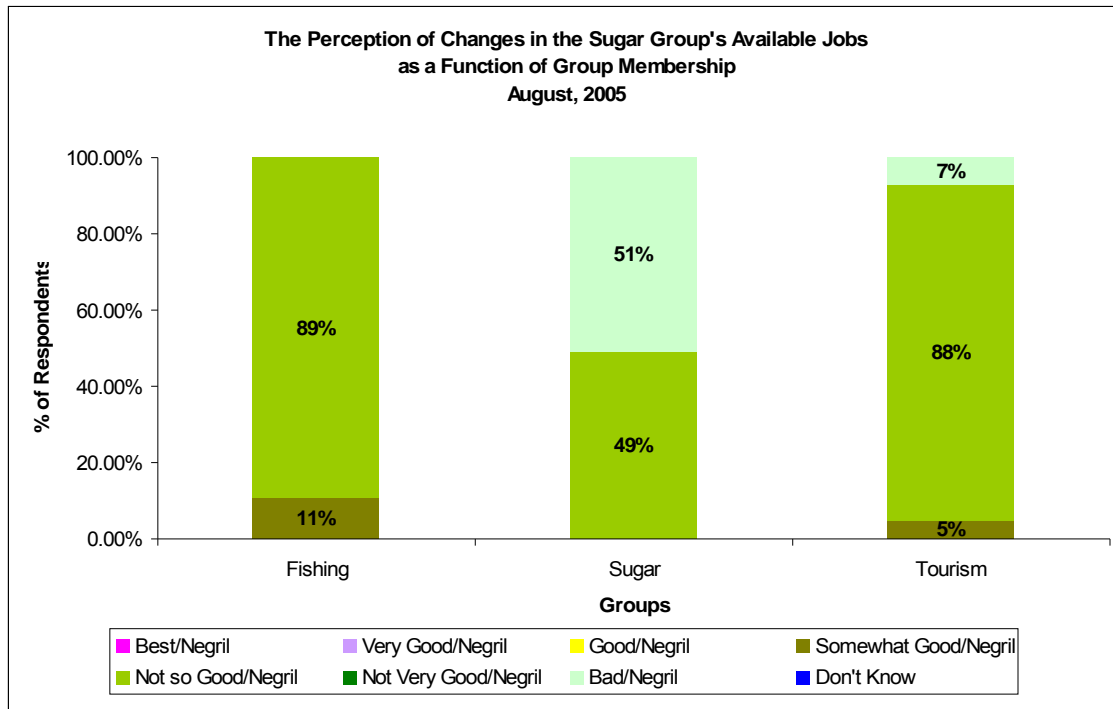
**Figure 6.6**



Source: The Conservation and Development Population Survey (Appendix A, Question 20).  
 Note: The results are accurate to within a 94% confidence interval.

Next, with a confidence interval of over 90%, the discriminant analyses found that no independent variable *significantly* influenced the within group perception of changes in the sugar group's available jobs (see Appendix H, Tables A5, A6 and A7). In general, fishing and sugar group members had a negative perception of changes in the sugar group's available jobs while the tourism group had a positive perception of the change. Figure 6.7 shows that the majority of the fishing respondents thought that the decrease in the sugar group's number of 'regular' workers was *bad for Negril*. In contrast, the majority of the tourism respondents thought that the change was *not so good for Negril*. Almost 50% of the sugar group thought that the changes were *bad for Negril*.

**Figure 6.7**



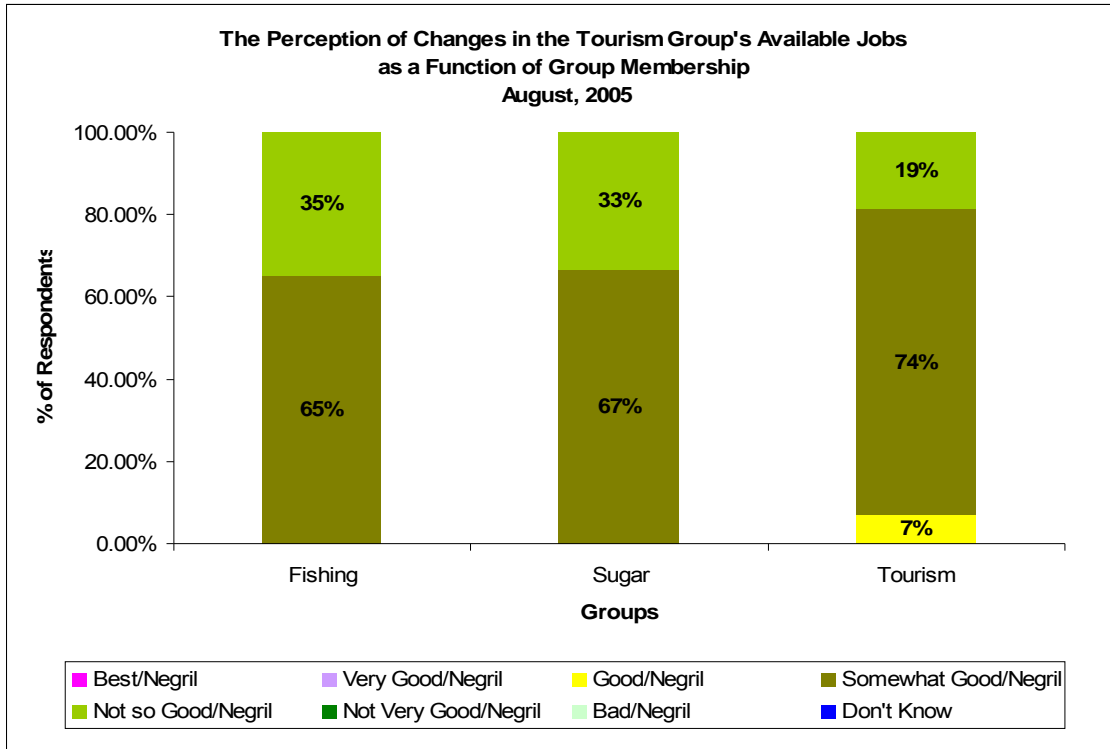
Source: The Conservation and Development Population Survey (Appendix A, Question 21).

Note: The results are accurate to within a 93% confidence interval.

Lastly, with a confidence interval of over 90%, the discriminant analyses showed that no independent variable significantly influenced the within group perception of changes in the tourism group's available jobs (See Appendix H, Tables A8, A9, and A10). Figure 6.8 shows that, in general, the majority of the fishing and sugar groups thought that the increase in the tourism group's job availability was *somewhat good* for Negril. However, almost one third of the fishing and sugar respondents thought that it was *not so good for Negril*.

Hypothesis 4: Among groups, the perception of changes in each group's available jobs does not vary according to years of residency, landownership, education, income, and/or gender. Three discriminant analyses were conducted to test this hypothesis.

**Figure 6.8**



Source: The Conservation and Development Population Survey (Appendix A, Question 22).

Note: The results are accurate to within a 92% confidence interval.

### *The Findings*

Overall, with a confidence level of over 90%, the discriminant analyses found that regardless of group membership, *education* and *years of residency* almost equally *significantly* influenced the perception of changes in the fishing, sugar and tourism groups' available jobs.

The discriminant analyses found that regardless of group membership, *years of residency*, with Wilks' lambda of .477, significantly influenced respondents' perception of changes in the fishing group's available jobs (Table 6.6). Respondents who have lived 16 or more years in the protected area generally had a negative perception of the changes while those that have lived in the protected area 16 years or less were less negative in their perceptions (see Figure 6.9). Based on *years of residency*, the discriminant analysis

**Table 6.6**

THE PERCEPTION OF CHANGES IN THE FISHING GROUP'S AVAILABLE JOBS THE TEST OF EQUALITY OF GROUP MEANS FOR <i>a priori</i> FISHING, SUGAR AND TOURISM RESPONDENTS					
	Wilks' Lambda	F	df1	df2	Sig.
YRSRES	.477	35.364	2	131	.000
EDUC	.483	34.519	2	131	.000
INCOME	.545	26.924	2	131	.000
LAND	.635	18.556	2	131	.000
AGE	.904	3.405	2	131	.011
GENDER	.949	1.735	2	131	.146

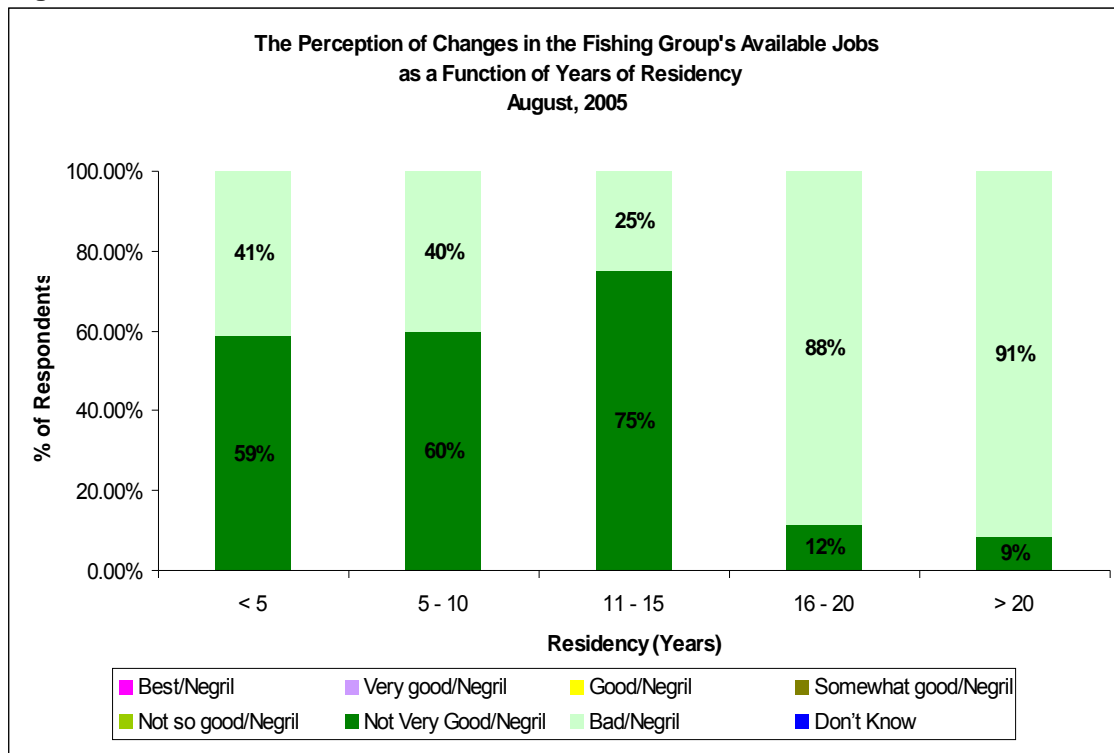
Source:

The SPSS Stepwise Discriminant Analysis on Question 20's Responses] (Appendix A: The Conservation and Development Population Survey).

Notes:

1. The maximum significance of F to enter for each variable is .05.
2. The maximum significance of F to remove for each variable is .10.

**Figure 6.9**



Source: The Conservation and Development Population Survey (Appendix A, Question 20).

Note: The results are accurate to within a 94% confidence interval.

found that 93%, 89% and 79% of the fishing, sugar and tourism respondents, respectively, were correctly classified (Table 6.7). Again, the tourism group was transient in its views.

**Table 6.7**

THE PERCEPTION OF CHANGES IN THE FISHING GROUP'S AVAILABLE JOBS THE RECLASSIFICATION OF <i>a priori</i> FISHING, SUGAR AND TOURISM GROUP MEMBERS BASED ON <b>YEARS OF RESIDENCY</b>						
GROUPS			PREDICTED GROUP MEMBERSHIP			TOTAL
			FISHING	SUGAR	TOURISM	
ORIGINAL <sup>1</sup>	COUNT	FISHING	43	2	1	46
		SUGAR	5	40	0	45
		TOURISM	8	1	34	43
	PERCENT	FISHING	93	4	3	100
		SUGAR	11	89	0	100
		TOURISM	19	2	79	100
CROSS-VALIDATED <sup>2</sup>	COUNT	FISHING	43	2	1	46
		SUGAR	5	40	0	45
		TOURISM	8	1	34	43
	PERCENT	FISHING	93	4	3	100
		SUGAR	11	89	0	100
		TOURISM	19	2	79	100

Source:

The SPSS Stepwise Discriminant Analysis on Question 20's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 87% of original grouped cases correctly classified.
2. 87% of cross-validated cases correctly classified.

Table 6.8 shows that based on *years of residency* and *education*, with combined Wilks' lambda of .483, 85%, 96% and 72% of the fishing, sugar and tourism groups, respectively, were correctly classified. Like *years of residency*, in general, education negatively influenced the perception of these changes. Thus, Figure 6.10 shows that regardless of group membership, the majority of the respondents at each education level thought that the changes in available fishing jobs were *bad for Negril*.



**Table 6. 8**

THE PERCEPTION OF CHANGES IN THE FISHING GROUP'S AVAILABLE JOBS THE RECLASSIFICATION OF <i>a priori</i> GROUP MEMBERS BASED ON <b>YEARS OF RESIDENCY</b> and <b>EDUCATION LEVEL</b>						
GROUPS			PREDICTED GROUP MEMBERSHIP			TOTAL
			FISHING	SUGAR	TOURISM	
ORIGINAL <sup>1</sup>	COUNT	FISHING	39	3	6	46
		SUGAR	2	43	0	45
		TOURISM	4	8	31	43
	PERCENT	FISHING	85	7	13	100
		SUGAR	4	96	0	100
		TOURISM	9	19	72	100
CROSS-VALIDATED <sup>2</sup>	COUNT	FISHING	39	3	6	46
		SUGAR	2	43	0	45
		TOURISM	4	8	31	43
	PERCENT	FISHING	85	7	13	100
		SUGAR	4	96	0	100
		TOURISM	9	19	72	100

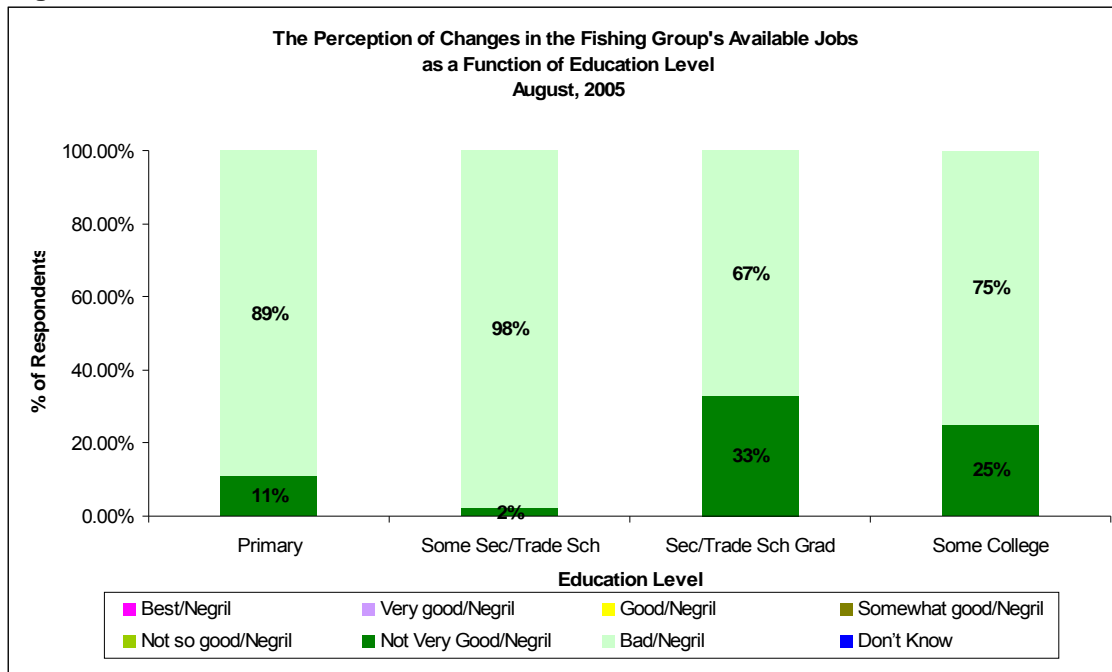
Source:

The SPSS Stepwise Discriminant Analysis on Question 20's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 84% of original grouped cases correctly classified.
2. 84% of cross-validated cases correctly classified.

**Figure 6.10**



Source: The Conservation and Development Population Survey (Appendix A, Question 20).

Note: The results are accurate to within a 94% confidence interval.

Next, regarding the perception of changes in available sugar jobs, the discriminant analyses found that regardless of group membership, *education*, with Wilks' lambda of .361, significantly influenced respondents' perceptions of changes in the sugar group's available jobs (Table 6.9). Figure 6.11 shows that the majority of respondents at all education levels generally thought that the changes in available sugar jobs were *not so good for Negril*. According to Table 6.10, based on *education* levels, the discriminant analysis found that 91%, 91% and 82% of the fishing, sugar and tourism respondents, respectively, were correctly classified. Again, the tourism group was transient in its view.

**Table 6.9**

<p style="text-align: center;">THE PERCEPTION OF CHANGES            IN THE SUGAR GROUP'S AVAILABLE JOBS            THE TEST OF EQUALITY OF GROUP MEANS            FOR <i>a priori</i> FISHING, SUGAR AND TOURISM RESPONDENTS</p>					
	Wilks' Lambda	F	df1	df2	Sig.
EDUC	.361	37.542	2	131	.000
YRSRES	.458	25.098	2	131	.000
AGE	.552	17.210	2	131	.000
LAND	.592	14.567	2	131	.000
INCOME	.653	11.229	2	131	.000
GENDER	.960	.885	2	131	.508

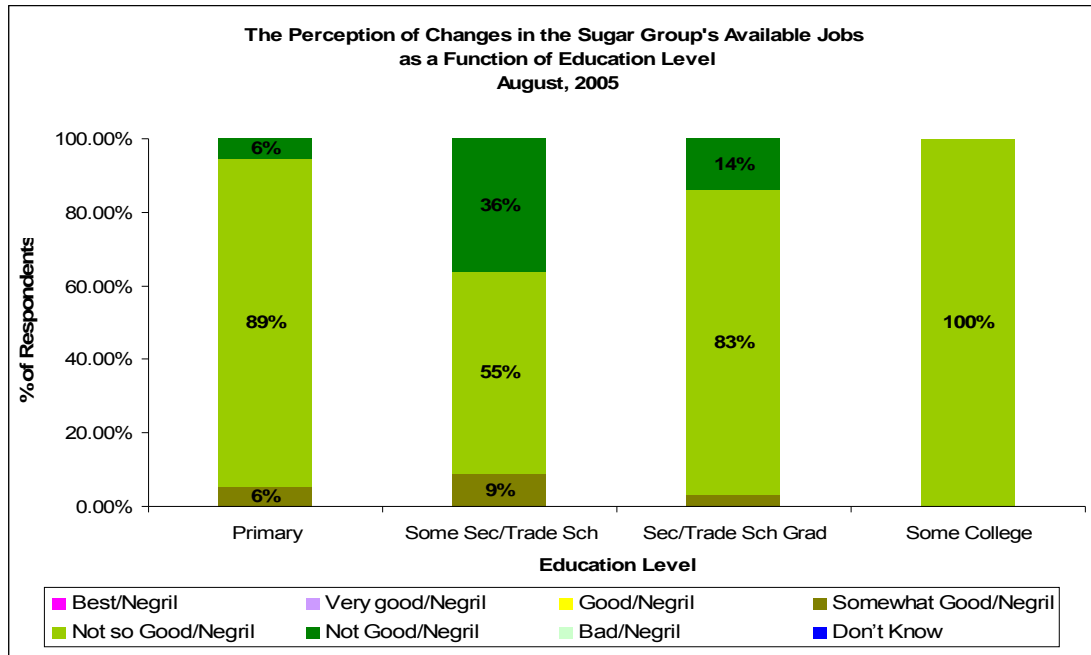
Source:

The SPSS Stepwise Discriminant Analysis on Question 21's Responses] (Appendix A: The Conservation and Development Population Survey).

Notes:

1. The maximum significance of F to enter for each variable is .05.
2. The maximum significance of F to remove for each variable is .10.

**Figure 6.11**



Source: The Conservation and Development Population Survey (Appendix A, Question 21).

Note: The results are accurate to within a 93% confidence interval.

**Table 6.10**

THE PERCEPTION OF CHANGES IN THE SUGAR GROUP'S AVAILABLE JOBS THE RECLASSIFICATION OF <i>a priori</i> FISHING, SUGAR AND TOURISM GROUP MEMBERS BASED ON <b>EDUCATION LEVEL</b>						
GROUPS			PREDICTED GROUP MEMBERSHIP			
			FISHING	SUGAR	TOURISM	TOTAL
ORIGINAL <sup>1</sup>	COUNT	FISHING	42	3	1	46
		SUGAR	1	41	3	45
		TOURISM	1	7	35	43
	PERCENT	FISHING	91	7	2	100
		SUGAR	2	91	7	100
		TOURISM	2	16	82	100
CROSS- VALIDATED <sup>2</sup>	COUNT	FISHING	42	3	1	46
		SUGAR	1	41	3	45
		TOURISM	1	7	35	43
	PERCENT	FISHING	91	7	2	100
		SUGAR	2	91	7	100
		TOURISM	2	16	82	100

Source:

The SPSS Stepwise Discriminant Analysis on Question 21's Responses] (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 88% of original grouped cases correctly classified.

2. 88% of cross-validated cases correctly classified.

Table 6.11 shows that based on *education* and *years of residency*, with combined Wilks' lambda of .458, 85%, 91% and 81% of the fishing, sugar and tourism groups, respectively, were correctly classified. Like *education*, *years of residency* negatively influenced the perception of changes in the sugar group's job availability. Thus, Figure 6.12 shows that regardless of group membership, the majority of respondents at all educational levels thought that the changes in the sugar group's available jobs were *not so good for Negril*.

**Table 6.11**

THE PERCEPTION OF CHANGES IN THE SUGAR GROUP'S AVAILABLE JOBS THE RECLASSIFICATION OF <i>a priori</i> GROUP MEMBERS BASED ON <b>EDUCATION</b> and <b>YEARS OF RESIDENCY</b>						
GROUPS			PREDICTED GROUP MEMBERSHIP			TOTAL
			FISHING	SUGAR	TOURISM	
ORIGINAL <sup>1</sup>	COUNT	FISHING	39	7	0	46
		SUGAR	4	41	0	45
		TOURISM	8	0	35	43
	PERCENT	FISHING	85	15	0	100
		SUGAR	9	91	0	100
		TOURISM	19	0	81	100
CROSS-VALIDATED <sup>2</sup>	COUNT	FISHING	39	7	0	46
		SUGAR	4	41	0	45
		TOURISM	8	0	35	43
	PERCENT	FISHING	85	15	0	100
		SUGAR	9	91	0	100
		TOURISM	19	0	81	100

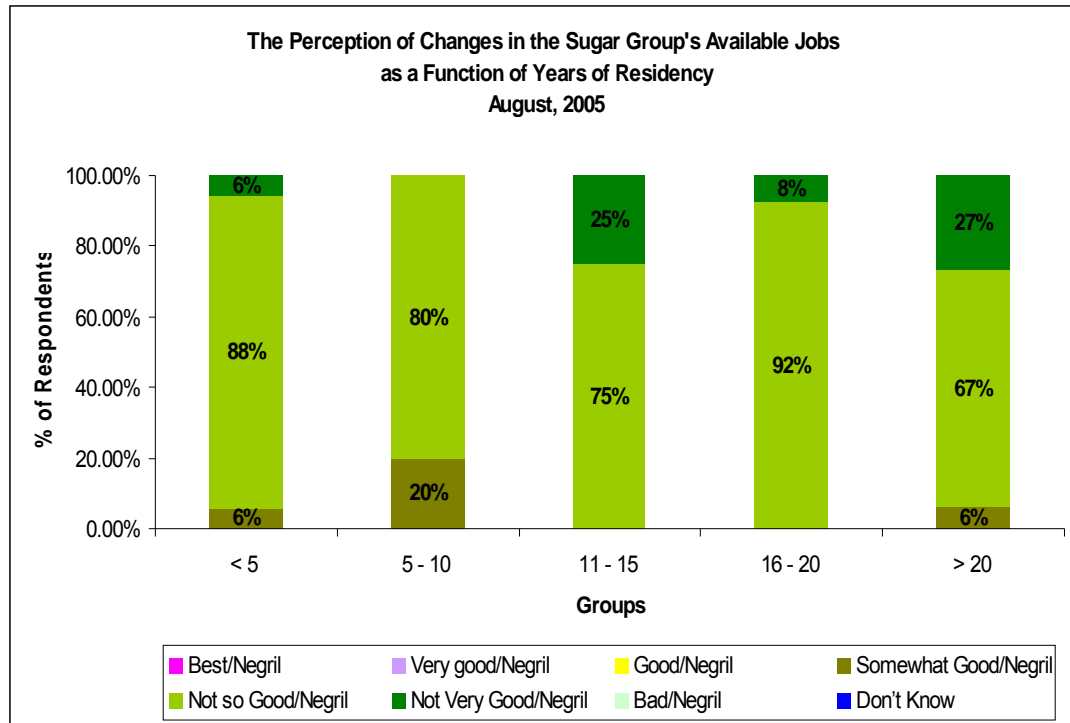
Source:

The SPSS Stepwise Discriminant Analysis on Question 21's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 86% of original grouped cases correctly classified.
2. 86% of cross-validated cases correctly classified.

**Figure 6.12**



Source: The Conservation and Development Population Survey (Appendix A, Question 21).

Note: The results are accurate to within a 93% confidence interval.

Finally, regarding the perception of changes in available tourism jobs, the discriminant analyses found that regardless of group membership, *education*, with Wilks' lambda of .394, significantly influenced respondents' perception of changes in the tourism group's available jobs (Table 6.12). Education at the *secondary/trade school graduate level* and *some college level* positively influenced the perception of changes in the tourism group's available jobs. Figure 6.13 shows that 75% or more of respondents with a secondary school education or higher thought that the changes in available tourism jobs were *somewhat good for Negril*, while almost 50% of those with primary and some secondary education thought that they were *not so good for Negril*. According to Table 6.13, the discriminant analysis found that 96%, 94% and 86% of the fishing, sugar and

**Table 6.12**

THE PERCEPTION OF CHANGES IN THE TOURISM GROUP'S AVAILABLE JOBS THE TEST OF EQUALITY OF GROUP MEANS FOR <i>a priori</i> FISHING, SUGAR AND TOURISM RESPONDENTS					
	Wilks' Lambda	F	df1	df2	Sig.
EDUC	.394	32.581	2	131	.000
YRSRES	.446	26.319	2	131	.000
AGE	.514	20.026	2	131	.000
LAND	.566	16.251	2	131	.000
INCOME	.627	12.599	2	131	.000
GENDER	.963	.806	2	131	.567

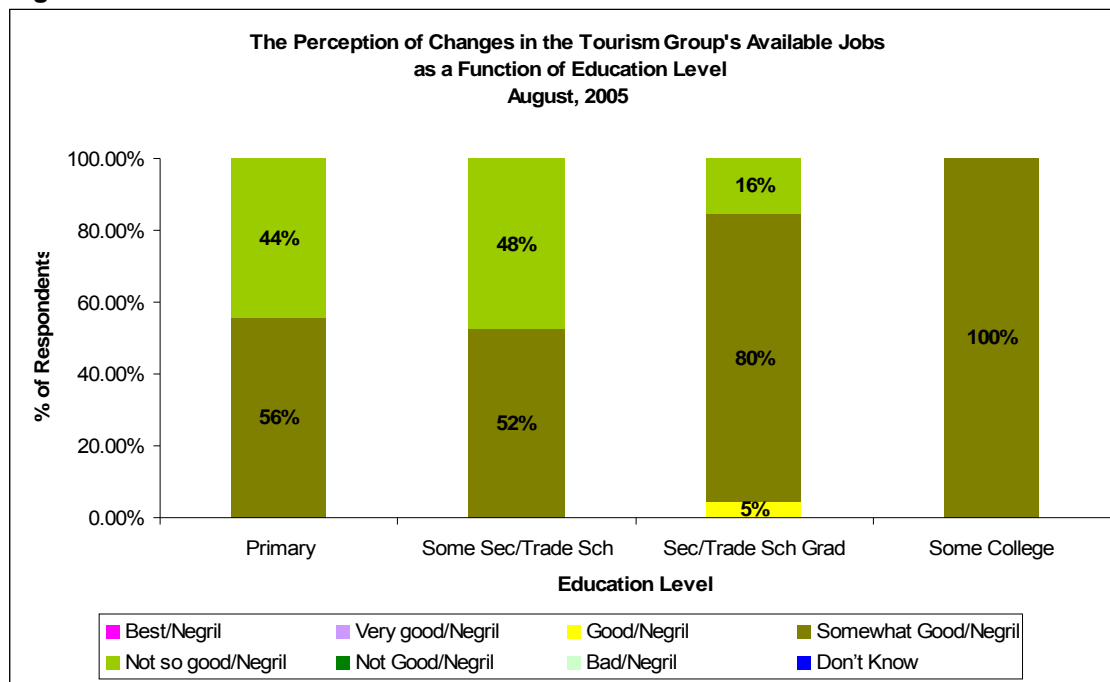
Source:

The SPSS Stepwise Discriminant Analysis on Question 22's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. The maximum significance of F to enter for each variable is .05.
2. The maximum significance of F to remove for each variable is .10.

**Figure 6.13**



Source: The Conservation and Development Population Survey (Appendix A, Question 22).

Note: The results are accurate to within a 92% confidence interval.

**Table 6.13**

THE PERCEPTION OF CHANGES IN THE TOURISM GROUP'S AVAILABLE JOBS THE RECLASSIFICATION OF <i>a priori</i> GROUP MEMBERS BASED ON <b>EDUCATION LEVEL</b>						
			PREDICTED GROUP MEMBERSHIP			
			FISHING	SUGAR	TOURISM	TOTAL
ORIGINAL <sup>1</sup>	COUNT	FISHING	44	1	1	46
		SUGAR	1	42	2	45
		TOURISM	1	5	37	43
	PERCENT	FISHING	96	2	2	100
		SUGAR	2	94	4	100
		TOURISM	2	12	86	100
CROSS- VALIDATED <sup>2</sup>	COUNT	FISHING	44	1	1	46
		SUGAR	2	42	1	45
		TOURISM	2	5	36	43
	PERCENT	FISHING	96	2	2	100
		SUGAR	4	94	2	100
		TOURISM	5	12	83	100

Source:

The SPSS Stepwise Discriminant Analysis on Question 22's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 92% of original grouped cases correctly classified.
2. 91% of cross-validated cases correctly classified.

tourism respondents, respectively, were correctly classified. Again, the tourism group was transient in its views.

Table 6.14 shows that based on *education* and *years of residency*, with combined Wilks' lambda of .446, 87%, 93% and 82% of the fishing, sugar and tourism groups, respectively, were correctly classified. Respondents with years of residency of 20 years or less had a positive perception of changes in the tourism group's job availability while those with greater than 20 years had a negative perception of the changes. Figure 6.14 shows that regardless of group membership, 75% or more of respondents who have lived less than 20 years in the protected area thought the changes in the tourism group's

**Table 6.14**

THE PERCEPTION OF CHANGES IN THE TOURISM GROUP'S AVAILABLE JOBS THE RECLASSIFICATION OF <i>a priori</i> GROUP MEMBERS BASED ON <b>EDUCATION</b> and <b>YEARS OF RESIDENCY</b>						
			PREDICTED GROUP MEMBERSHIP			
			FISHING	SUGAR	TOURISM	TOTAL
ORIGINAL <sup>1</sup>	COUNT	FISHING	40	5	1	46
		SUGAR	3	42	1	45
		TOURISM	4	4	35	43
	PERCENT	FISHING	87	11	2	100
		SUGAR	7	93	2	100
		TOURISM	9	9	82	100
CROSS-VALIDATED <sup>2</sup>	COUNT	FISHING	40	5	1	46
		SUGAR	3	42	1	45
		TOURISM	4	4	35	43
	PERCENT	FISHING	87	11	2	100
		SUGAR	7	93	2	100
		TOURISM	9	9	82	46

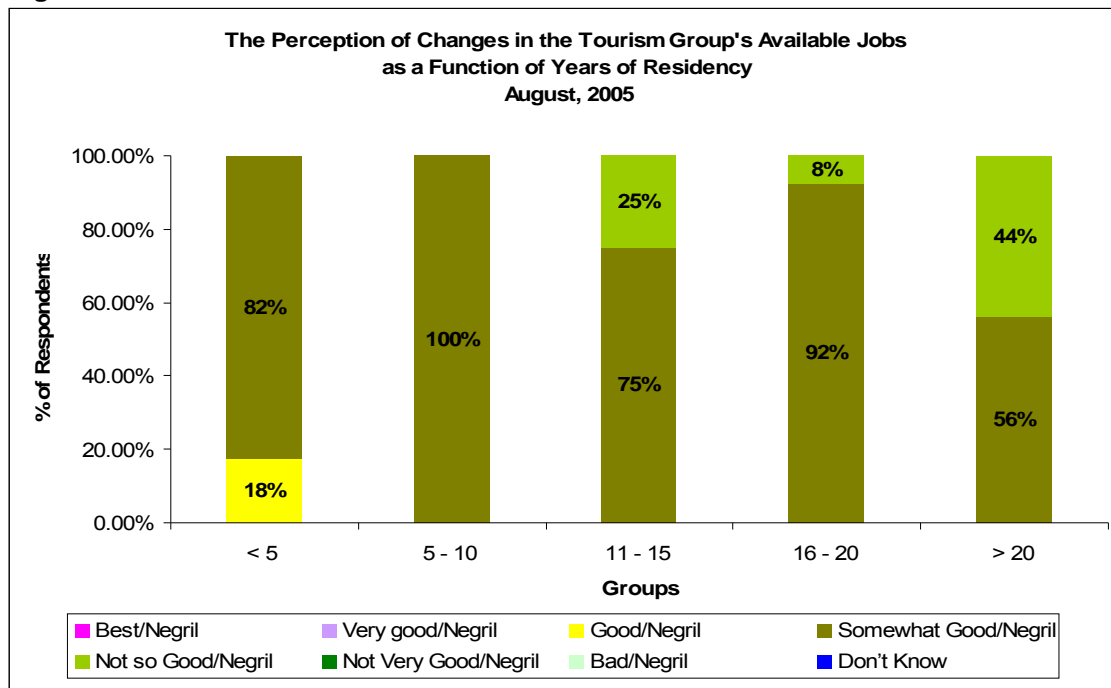
Source:

The SPSS Stepwise Discriminant Analysis on Question 22's responses (Appendix A: The Conservation and Development Population Survey).

Notes:

1. 87% of original grouped cases correctly classified.
2. 87% of cross-validated cases correctly classified.

**Figure 6.14**



Source: The Conservation and Development Population Survey (Appendix A, Question 22).

Note: The results are accurate to within a 92% confidence interval.



available jobs were *somewhat good for Negril*. In contrast, regardless of group membership, only about a half of those who have lived 20 years or more in the protected area thought that it was *somewhat good for Negril*. The balance thought that it was *not so good for Negril*.

The Perception of Changes in the Fishing, Sugar and Tourism Groups' Available Jobs *Within and Among Groups*

Overall, the fishing, sugar and tourism groups' members were homogeneous in their perception of changes in each group's available jobs. Second, regardless of group membership, *education* and *years of residency*, significantly influenced the perception of changes in each group's available jobs.

Beginning with the fishing group, regardless of group membership, respondents who lived in the protected area 16 years or less had a positive perception of the decline in fishing jobs. In general, they perceived the changes positively since these changes resulted in the decline of strewn canoes, nets, sheds and poorly clad fishermen on the protected area's beaches. Most thought that the presence of the fishing villages imparted images of a derelict landscape that was unsuitable for Negril's tourism image.

In contrast, respondents who have lived in the protected area for 20 years or more saw the decline as the destruction of a significant part of the cultural landscape, and thus an intangible loss to the greater population. Others noted that fishermen had primarily an elementary education, and thus were not formally trained to work outside of the industry. Others noted that the increased roles of fishermen in illicit activities that seemed to have accompanied the decline in the fishing industry were not the type of jobs that maintained social and economic stability in Negril.

Next, regardless of group membership, *education* negatively influenced the perception of changes in the sugar group's available jobs. Most interviewees explained that their family's current employment in the industry was simply to earn "enough money to send their children to school so that they have better employment choices." While admitting that the income earned in the sugar industry had been central to their household economics, interviewees in general pointed out that "sugar jobs were for unlearned people." In general, they observed that after graduating high school and having the opportunity for 'better' jobs in the tourism industry or elsewhere, working in the sugar cane fields was not an option.

Lastly, regardless of group membership, *education* positively influenced the perception of changes in the tourism group's available jobs. The majority of the interviewees thought that they were *good for Negril* since, with education, their children "now had better alternative employment to the sugar cane fields." However, many interviewees were not very positive on the shift in employment from sugar to tourism. They found that with that switch, fewer families had a stable source of income because employment in the tourism industry was dependent on the weather and the goodwill of foreign news reports on Jamaica.

A significant number (21/30) of the interviewees cited the local population's reduced access to beaches, the relative increase in the number of 'squatters' in the urban center, and the relative increase in illegal activities as significant negatives that have accompanied the tourism industry's growth. Tourism interviewees, in general, noted that though the growth in the industry provided more employment opportunities for secondary/trade school graduates, the idea of constantly being accommodating to rude

‘foreigners’ was particularly ‘galling.’ Thus, each of the ten tourism interviewees spoke of ‘putting on a plastic smile or skinning my teeth’ when he or she is around ‘them’ [tourists]. Lena<sup>118</sup>, a craft vendor, noted that “plastic smile (or *skin teeth* as it is often referred to in Negril) covers a multitude of evil thoughts when they [tourists] are being particularly rude and you have to be nice or they won’t come back to your country.”

In summary, the fishing, sugar and tourism groups were homogeneous in their perception of changes in available jobs. *Education level*, and to a lesser extent, *years of residency* significantly influenced respondents’ perceptions of the changes. However, the semi-structured interviews showed the conflicting decisions that play a part in respondents’ perceptions. In particular, although respondents somewhat welcomed the jobs associated with the tourism industry they disliked the images that they must portray to keep those jobs. One of the reasons that the majority of the survey responses regarding the tourism group were conditional was the limitation that interviewees thought that it had imposed on the local populations’ freedom of movement and expression.

#### CONCLUSION

According to the social science critique of protected areas, one reason that participatory-planned conservation policies have not prevented changes in local populations’ natural resource use is the incorrect assumption that groups are primarily homogeneous in their desire for conservation and development when they are not. However, with respect to the fishing and sugar groups, the research finds that, in general, groups that have shared histories are homogeneous in their perception of conservation and development. In contrast, like the tourism group, newer entrants to the protected area are likely to be extremely heterogeneous in their views of conservation and/or

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<sup>118</sup> Pseudonym.

development. Second, the research finds that in Negril, changes in the demographic characteristics of the local populations significantly influenced the perception of conservation and development.

The significance of years of residency and education to the perception of conservation and of changes in the protected area's natural resource use is complex. As Negril's population changes, the survey findings and the semi-structured interviews suggest that while the decline of commercial fishing seems likely, and that of sugar is unclear, it is likely that the tourism group will continue to increase its use of the protected area's natural resources. Negril's relatively newer residents' positive perception of conservation and of the increase in the tourism group's natural resource use underscore the complex issues that underpin the management of protected areas' natural resource use.

## CHAPTER 7 SUMMARY AND CONCLUSION

This chapter has three sections. The first summarizes the research by reviewing the background to the study, the research questions asked, the methodologies used, and the findings. The second reviews the need for additional research. Lastly, the third section concludes the dissertation with an examination of its contribution to the academic literature.

### THE RESEARCH

This dissertation research took place in the Negril Environmental Protection Area, western Jamaica from June 2003 to December 2005. The research sought to determine the extent to which participatory-planned conservation policies influenced changes in the local populations' natural resource use between 1990 and 2005. According to much of the social science critique of protected areas, local populations' natural resource use changes once an area has been so designated. Critics find that the current participatory-planned conservation policy framework has failed because the policies developed are infused with meanings of *a nature* that is fragile, and thus, unable to withstand particular uses.

Yet, the colonial and non-colonial socioeconomic and political systems encountered in Negril suggest that the current conservation policy framework may have very little influence on changes in natural resource use. Rather, they suggest that socioeconomic policies and the relative power of groups are likely to have a greater influence on the protected area's natural resources. Further, the interplay observed among Negril's three major economic groups suggests that group membership and demography are likely to influence the perception of conservation as well as of changes in each group's natural resource use.

The Negril Environmental Protection Area was selected for this research because it encompasses the complexities of balancing conservation and development projects within protected areas that are replete with colonial and non-colonial influenced cultural, political and socioeconomic systems. The research focused in particular on the fishing, sugar and tourism groups because their similarities and differences offer the opportunity for one to examine the challenges of implementing participatory-planned conservation policies within these systems.

Two major questions are asked. First, in what ways did the participatory-planned conservation policies influence changes in the protected area's natural resource use? Second, how does group membership and demography influence the perception of the conservation policies and of changes in natural resource use? The recent significant growth in developing countries' protected areas makes the research findings particularly important to other developing countries that are currently designating similar landscapes as protected areas.

### The Negril Environmental Protection Area

Negril's declaration as a protected area in 1995, with boundaries extending to the outer limits of the Negril and Green Island Watersheds, brought, for the first time, all its natural resources under one management plan. The protected area's boundary cuts across the western tip of the parishes of Hanover and Westmoreland, and is bounded in the north, south and west, by the Caribbean Sea. Representatives from identified stakeholder groups participated in the identification of Negril's environmental issues and the development of policies to mitigate them. In general, participants had a holistic view of Negril's environment. Thus, most viewed the conservation of Negril's natural resources

as ‘good’ for the local population. Further, they concurred with the national government’s studies that cite the fishing, sugar and tourism groups as primary contributors to Negril’s environmental problems. Thus, for each group, industry-specific conservation policies were developed. However, their similarities and differences suggest that their implementation of the policies is likely to be negotiated differently, and thus have differing impact on their natural resource use.

#### The Fishing, Sugar and Tourism Groups

The fishing, sugar and tourism groups have played pivotal roles in Negril’s geographic landscape. Yet, while the fishing and sugar groups have operated in Negril since the 1700s, the tourism group is relatively new. In many ways, tourism’s arrival in the mid to late 1960’s reiterated the economic importance of this geographic area to the national economy. The tourism group’s operations are capital intensive. The five-star hotels, glass bottom boats, and jet skis that frame the protected area’s beaches not only reflect Negril’s current public persona, but also tourism’s very concentrated power base.

In contrast, a diffused power base and a relatively sparse capital structure characterize the fishing group. Fishing villages, which are scattered along the protected area’s entire coastline, are typically strewn with zinc clad sheds, canoes and oars, hand-drawn fishnets, and single-shot spears. Ownership of a canoe represents a significant financial investment for a fisher family. Usually, such an investment is underpinned by that family’s expectation of a long-term commitment to the industry. Thus, not only are canoes passed on to successive generations, but also it is commonplace for fishermen to share canoes.

In contrast to both the fishing and tourism groups, the sugar group's relatively concentrated power base and capital-intensive operations are reflected in sugar farmers' control of 70% of the protected area's arable land, and processing of one-third of Jamaica's raw sugar exports. Sugar's large-scale colonial transformation of Negril's arable land not only solidified the protection area's current landownership structure and tenure, but also it dictated the location and function of early villages, towns and transportation routes.

While each group represents contrasting aspects of Negril, each has contributed to the local population's economic well being. Each employs labor-intensive operations that have been the primary source of income for the local populations. However, if the social science critique is true, on the implementation of the conservation policies, each group's natural resource use should change, and consequently, the number and types of jobs that are available to the local populations.

## THE RESEARCH QUESTIONS, METHODOLOGY AND FINDINGS

### Research Question 1

Focusing on the fishing, sugar and tourism groups, the first research question asks, from 1995 to 2005, in what ways did the participatory-planned conservation policies influence changes in their natural resource use. Since each group's operations are labor intensive, changes in their natural resource use is measured in terms of changes in available jobs.

### Data and Methodology

To answer this first question, changes in the fishermen to canoe ratio, the number of 'regular' workers to hectares harvested ratio, and the number of rooms to 'minimum'



number of workers ratio are analyzed for the fishing, sugar and tourism groups, respectively.

Second, to understand the likely causes of observed trends, a content analysis of the conservation and socioeconomic policies that were implemented during the study period was also conducted. Documents examined include laws, Ministry Papers, Parliamentary Debates, Memorandum of Understandings between relevant government and non-government agencies, and conservation and fishing, sugar and tourism groups' Annual Reports, and the minutes of their Board of Directors' meetings.

### *The Findings*

In general, the research finds that though job availability in the fishing, sugar and tourism groups changed, very little of these changes were due to the participatory-planned conservation policies. Further, as the social science critique finds, the ability of the groups to gain or retain control of the protected area's natural resources depended on the extent to which each had institutional capacity.

To illustrate, in *the fishing industry*, though the number of fishermen and canoes declined significantly, the fishing records show that these changes actually began prior to Negril's protected area designation. More importantly, though, the significant change in the canoe to fishermen ratio from one canoe for two fishermen to one canoe for three and a half fishermen (1:2 to 1:3.5) indicated that fewer fisher families were investing in canoes, and therefore did not expect future generations to have a long-term association with the industry.

The content analysis finds that while the conservation policies regulated the fishing equipment and methods, the tourism group's immediate occupancy of the vacated fishing

areas stemmed from tourism-driven socioeconomic policies. Thus, as the fishing group's use of the coastline and the protected area's beaches declined, the tourism group's number of rooms and 'minimum' number of workers employed increased significantly. In essence, the conservation policies simply smoothed the way for the tourism group to expand.

During the study period, although a moratorium on tourism-related construction was implemented as part of the protected area's management plan. Negril's number of rooms more than doubled from 2,300 to 4,700. More importantly, though, as number of rooms increased, the number of workers employed increased significantly. Thus, throughout the study period, the worker to rooms ratio ranged from one and a half workers to one room (1.5 workers to 1 room), to 1.8 workers to one room.

Lastly, for *the sugar group*, the number of 'regular' workers and number of hectares harvested declined. However, in contrast to the fishing and tourism groups, the sugar group had an abundance of jobs but increasingly less 'regular' workers. The trend analysis shows that during the study period, the number of 'regular' worker to hectares harvested ratio declined from one 'regular' worker to two hectares to one 'regular' worker to more than six hectares. The All Island Cane Farmers Association's annual operations' records as well as large sugar cane farmers' annual field reports showed an immense increase in the employment of temporary workers.

In summary, changes in the fishing, sugar and tourism groups' available jobs were primarily due to the national socioeconomic policies that were in place prior to the protected area designation as well as those that were implemented during the study period. However, as the social science critique finds, the ability of the groups to gain or

retain control of the protected area's natural resources depended on the extent to which each had institutional capacity. Unlike the sugar and fishing groups, the tourism group's institutional capacity stemmed from the relative power of the Urban Development Corporation, which facilitated its use of Negril's natural resources, and the strategic development of a tourism workforce.

#### Research Question 2

The social science literature suggests that although the participatory-planned conservation policy framework assume that group members are similar in their views on conservation and development, it is likely that they are not. The second research question that asks how demography or group membership influences the perception of changes in the fishing, sugar and tourism groups' natural resource use. The independent variables selected for analysis are *age*, *years of residency*, *family landownership*, *education level*, *average monthly income*, and *gender*. Based on what is known about the groups, any of these independent variables may influence the perception of changes in their natural resource use.

The null hypotheses are:

1. Within each group, the perception of conservation does not vary according to age, years of residency, landownership, education, income, and/or gender..(Question 3, Appendix A).
2. Among groups, the perception of conservation does not vary according to years of residency, landownership, education, income, and/or gender (Question 3, Appendix A).

3. Within each group, the perception of changes in each group's available jobs does not vary according to age, years of residency, landownership, education, income, and/or gender (Question 20, 21, 22, Appendix A).
4. Among groups, the perception of changes in each group's available jobs does not vary according to years of residency, landownership, education, income, and/or gender (Questions 20, 21, and 22, Appendix A).

### Data and Methodology

To test the hypotheses, a population survey was conducted from June 2005 to August 2005.<sup>119</sup> The survey involved the use of a partially closed-ended questionnaire. The results were first summarized using descriptive statistics and later subjected to forward stepwise discriminant analyses. Semi-structured interviews were conducted on members of the sample population.

A partially closed-ended questionnaire was selected since it best satisfied the criteria and the cultural characteristics of the target population. In designing the questionnaire for Negril's fishing, tourism and sugar populations, three primary goals were weighed. The first aimed to increase the survey response rate by minimizing the demand on respondents' time and efforts. The second, aimed to minimize the time and expense of writing, conducting, and coding the survey questionnaire. Lastly, the third, aimed to produce survey questions that were clear and concise. Thus, in designing this questionnaire, answer choices were provided but respondents could add the alternative answer choice 'Don't Know.' Respondents also had the option of adding unlisted answer preferences under 'Other.' A Likert scale was used to rank each answer choice. Questions were asked to first elicit the populations' perception of conservation before introducing

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<sup>119</sup> A population survey pretest was conducted in March 2005 to test questionnaire and interview format.

the fishing, sugar and tourism groups. This approach to the question ordering aimed to minimize the influence of the populations' views of each industry on their perception of the conservation policies. Thirty-five questions, including six personal questions, were asked (Appendix A).<sup>120</sup>

To test hypotheses one and two, question three asked, *how much do you think that the protected area's policies have changed Negril's environment?*<sup>121</sup> To test hypotheses three and four, questions 20, 21, and 22 asked, *what do you think about the changes in the [fishing, sugar or tourism] industry?* The six personal questions asked determined each respondent's age, years of residency in the protected area, family landownership, education level, average monthly income, and gender.

In selecting the sample population, the fishing, tourism and sugar group's populations were defined as individuals who worked closely with Negril's physical environment. Thus, the fishing population included licensed and unlicensed commercial fishermen, as well as women that work in fishing village cook shops. The sugar group's population was defined as independent sugar cane farmers, and hoist and field workers that maintain farms within the protected area. Lastly, for the tourism group, the population was defined as tour bus drivers, taxi drivers, hair braiders, craft vendors, water sports operators, housekeeping, and kitchen staff.

Based on the cost and the time available to complete the survey, a population sample size of 150 persons with 50 each representing Negril's fishing, sugar and tourism populations were selected. Since each group was not normally distributed, and the goal of

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<sup>120</sup> Some of the survey questions that were asked will inform future research in Negril.

<sup>121</sup> Recall from the town hall meetings that the population in general had a holistic view of Negril.

the survey was to gather the most accurate representative view, disproportional stratified random sampling based on group and then subgroup representation (gender, job classification, and geographic location within the protected area) was used to select the survey sample population. Thus, the selected fishermen represented the protected areas' seven fishing villages. The sugar population sample represented independent farmers, hoist and field workers from Hanover and Westmoreland. Lastly, the tourism sample population reflected job variability and hotel location.

The population survey was conducted through personal interviews to increase the response rate, and to note potential candidates for follow up semi-structured interviews. This survey methodology was used in recognition of the limitations that other survey methods would have encountered in Negril. The potential of influencing answer choices through facial expression and/or body language were minimized through clear, concise questions and answer choices.

To test the hypotheses, forward stepwise discriminant analyses were conducted on the responses to questions 3, 20, 21, and 22 (Appendix A). This use of discriminant analysis was limited to the *Tests of Equality of Group Means (The Analysis of Variance [ANOVA] Table)* and *The Classification Table* since both provides the information necessary to answer the research question. Wilks' lambda ( $\lambda$ ) was the statistic used to determine the ways in which demography and/or group membership influenced the perception of conservation and of changes in each group's available jobs.

Discriminant analysis assumes a normal distribution that takes the form:

$$Z = b_1X_1+b_2X_2+b_3X_3\dots b_nX_n+c$$

Where  $Z$  = discriminant score

$b$  = discriminant weights

$X$  = predictor (independent) variables

$c$  = constant

While discriminant analysis assumes a normal distribution, recall that the fishing, sugar and tourism populations are not normally distributed. However, discriminant analysis is not particularly sensitive to minor violations of the normality assumption. The best guide to the extent of data distortion is the percentage of correct classifications (*The Classification Table*). If this percentage is high for *a priori* group membership, the violations of assumption were not very harmful.

The discriminant analyses tested the hypothesis that based on the selected independent variables, group (or subgroup) means were equal ( $H_o: \mu_A = \mu_B$ ). Each discriminant analysis involved a two step process. The first involved an F test (Wilks' lambda) which assessed whether the discriminant model was significant, that is, whether there were differences within the groups (hypotheses 1 and 3) or among the groups (hypotheses 2 and 4), and which independent variables were significant. Second, where the F test showed significance, each independent variable was assessed to see which differed significantly in mean within the groups (hypotheses 1 and 3) or among the groups (hypotheses 2 and 4). The independent variable that did was used to classify respondents.<sup>122</sup>

For this research, variables with Wilks' lambda ( $\lambda$ ) greater than .50 were accepted as an indicator that groups (or subgroups) were not homogenous. Variables with Wilks' lambda of .50 or less were accepted as evidence of significant differences within the

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<sup>122</sup> Recall that Wilks' Lambda ( $\lambda$ ) varies from zero to one for each independent variable, with zero meaning that group means differ significantly based on that variable, and one meaning that all group means are the same for that variable.

groups (hypotheses 1 and 3) or among groups (hypotheses 2 and 4) on the hypothesis being tested.

To understand better the results of the discriminant analyses, semi-structured interviews were conducted primarily on thirty-one randomly selected survey respondents. These respondents were selected from the 94 survey interviewees who expressed interest in participating in follow-up interviews. Additionally, snowball sampling was used to identify industry-specific interviewees whose knowledge was pertinent to the study but who were outside the sample population. These interviews were conducted primarily to get clarification on sensitive issues.

The semi-structured method of interviewing was used since one could control the direction of the interview while allowing interviewees to introduce potentially significant information that may not have been covered elsewhere. The *basic* semi-structured interview questions were drawn from the population survey questionnaire. Additional questions were added during the interviews to clarify issues or to get respondents to elaborate on particular points that were raised. Like the survey population, the semi-structured interview population spoke on the condition of anonymity.

### *The Findings*

Overall, 134 of the 150 respondents (89%) completed the survey. Of the 134 respondents, 46, 45, and 43 represented the fishing, sugar, and tourism groups, respectively. Surveys were completed in pen as requested. Nine surveys had corrections where respondents made changes in reference to their perception of changes in the sugar industry (Q 21, Appendix A). Since hypotheses 1 and 2 tested the perception of conservation, their results are discussed simultaneously. Similarly, since hypotheses 3



and 4 tested the perception of changes in each group's available jobs, the results are also discussed simultaneously.

Hypothesis 1: Within each group, the perception of conservation does not vary according to age, years of residency, landownership, education, income, and/or gender (Question 3, Appendix A). Based on the survey responses, a group is homogenous if 90% or more of its members' responses were within the boundaries of that group's centroid for any independent variable. One discriminant analysis was conducted for each group.

Hypothesis 2: Among groups, the perception of conservation does not vary according to years of residency, landownership, education, income, and/or gender (Question 3, Appendix A). One discriminant analysis was conducted to test this hypothesis.

#### The Perception of Conservation

With a confidence interval of more than 90%, the research finds that within the fishing and sugar groups, no independent variable *significantly* influenced the perception of conservation. The majority of the fishing and sugar groups thought that the conservation policies had not had an impact in Negril. However, within the tourism group, *years of residency significantly* influenced the perception of conservation. Tourism respondents who have lived in the protected area for fifteen years or less thought that the conservation policies had *somewhat improved* Negril's environment while those who have lived much longer in the protected area thought that there had been *no change*. This similarity in views among tourism residents who have lived twenty years or more in the protected area, and the fishing and sugar groups is to be expected because they were primarily former fishermen who capitalized on the early growth of the tourism industry.

Next, regardless of group membership, with a confidence interval of more than 90%, *years of residency*, and to a lesser extent, *education*, was the most important independent variable that influenced the perception of conservation. In general, respondents who have lived more than fifteen years in the protected area had a negative perception of conservation. In contrast, those who have lived fifteen years or less had a positive perception of conservation.

Respondents who have lived more than fifteen years in the protected area were primarily from the fishing and sugar groups while the majority of those who have lived fifteen years or less represent the tourism group. In general, the fishing, sugar and tourism group members who have lived more than fifteen years in the protected area thought that the conservation policies had had *no impact* on the protected area since the sugar and tourism groups repeatedly ignored them. Some of these respondents pointed to the continued ‘dumping’ of the coastal wetlands to facilitate tourism growth, and the continued use of spectracide and herbicide in the sugar cane fields as reasons for their opinion. Others pointed to the ‘bait-and-switch’ technique used to remove fishermen from beach areas for conservation purposes, and the almost immediate construction of five star hotels in those areas.

Tourism respondents who have lived in the protected area for fifteen years or less had a positive perception of conservation. In general, they thought that the conservation policies had *somewhat improved* Negril’s environment since there was increased dialogue on issues ranging from recycling to the development of a centralized sewerage system. In fact, they argued that with this foundation, Negril’s conservation proponents could gain ground in the battle to conserve the watersheds.

Hypothesis 3: Within each group, the perception of changes in each group's available jobs does not vary according to age, years of residency, landownership, education, income, and/or gender (Questions 20, 21, and 22, Appendix A). Based on the survey responses, a group is homogenous if 90% or more of its members' responses are within the boundaries of that group's centroid for any independent variable. Nine discriminant analyses were conducted to test this hypothesis: Three each (one each for the fishing, sugar and tourism groups' perception) was conducted on the changes in available jobs for each of the three groups.

Hypothesis 4: Among groups, the perception of changes in each group's available jobs does not vary according to years of residency, landownership, education, income, and/or gender (Questions 20, 21, and 22, Appendix A). Three discriminant analyses were conducted to test this hypothesis. One each was conducted on the three populations' perception of changes in the fishing, sugar and tourism groups' available jobs.

#### The Perception of Changes in the Fishing, Sugar and Tourism Groups' Available Jobs

With a confidence interval of more than 90%, the research finds that within groups, no independent variable significantly influenced the perception of job availability. Second, with a confidence interval of more than 90%, regardless of group membership, *education* and *years of residency* were the most important independent variables that influenced the perception of job availability among groups.

Beginning with the fishing group, regardless of group membership, respondents who have lived in the protected area twenty years or less had a positive perception of the decline in fishing jobs. In general, they perceived the changes positively since these

changes resulted in the decline of strewn canoes, nets, sheds and poorly clad fishermen on the protected area's beaches. Most thought that the presence of the fishing villages imparted images of a derelict landscape that detracted from Negril's tourism image. In contrast, respondents who have lived in the protected area for twenty years or more saw the decline in fishing jobs as the destruction of a significant part of the cultural landscape, and thus an intangible loss to the greater population.

Next, regardless of group membership, and academic level, education negatively influenced the perception of changes in the sugar group's available jobs. Yet, most interviewees explained that their family's current employment in the industry was simply to earn "enough money to send their children to school so that they could have better employment choices." While admitting that the income earned in the sugar industry has been central to their household economics, in general, interviewees pointed out that sugar jobs were for *unlearned* peoples. They observed that after graduating high school and having the opportunity for 'better' jobs in the tourism industry or elsewhere, working in the sugar cane fields was not an option.

Lastly, regardless of group membership, education at the secondary or trade school graduate level positively influenced the perception of changes in the tourism group's available jobs. The majority of the interviewees thought that the increase in available jobs was *good for Negril* since, their children "now had alternative employment (to the sugar cane fields)." However, many interviewees were not very positive on the shift in employment from sugar to tourism. They found that with that switch, fewer families had a stable source of income since employment in the tourism industry was dependent on the weather and the goodwill of foreign news reports on Jamaica.

In summary, *years of residency* significantly influenced the perception of conservation among tourism group members. In contrast, no independent variable significantly influenced the perception of conservation in the fishing and sugar groups. Regardless of group membership, *years of residency* influenced the perception of conservation among groups. Next, within each group, no independent variable significantly influenced the perception of changes in the groups' available jobs. However, regardless of group membership, *years of residency* had the most influence on the perception of changes in the fishing group's available jobs while *education* had the most influence on the perception of changes in the sugar and tourism groups' available jobs.

Respondents who were relatively new to the protected area had a positive perception of conservation and of the decline in fishing jobs. Respondents at all academic levels had a negative perception of the decline in sugar jobs. Respondents who were secondary or trade school graduates had a positive perception of the increase in tourism jobs. The discriminant analyses showed that the tourism group members were the most transient of the three groups in their perception of conservation and of changes in each group's available jobs.

The semi-structured interviews show the conflicting decisions that played a part in respondents' perceptions. In particular, although respondents somewhat welcomed the jobs associated with the tourism industry, they disliked the images that they must portray to keep those jobs. One of the reasons that the majority of the responses regarding the tourism industry were conditional is the limitation that it has placed on the local populations' freedom of movement and cultural expression. In fact, tourism interviewees note the importance of 'skin teeth' to survive employment in the industry.

## THE NEED FOR ADDITIONAL RESEARCH

First, the growth in the tourism group's available jobs relative to those of the fishing and sugar groups marks a fundamental philosophical shift in the region from an agrarian economy (that uses male dominated labor) to one underpinned by the service industry (that uses primarily female labor). Research that examines the long-term impact of the re-gendering of Negril's workforce is necessary. Second, with the decline in available sugar labor, landowners have withdrawn significant portions of farmlands from production. In the long term, research is necessary to examine the conversion rate of farmlands to grasslands to tropical savanna, and the benefits that are likely to accrue to the protected area in terms of a relatively 'healthier' watershed.

## CONCLUSION

The social science literature notes that one major factor that underpin much of the changes in recently designated protected areas' natural resource use is the ability of groups to create and maintain institutional capacity. In Negril, the creation of institutional capacity is strongly associated with the relative power of support groups and access to labor. From 1990 to 2005, the relative difference with which the fishing, sugar and tourism groups could manipulate use of the protected area's natural resources rested within the socioeconomic policies that were implemented, and each group's ability to create and maintain institutional capacity.

Throughout the study period, the fishing, sugar and tourism groups' competition for Negril's natural resources continued. While the sugar and tourism groups maintained their roles as the dominant economic stakeholders, the fishing group's demise in the short term was increasingly obvious by the study's end. The fishing group's lack of

institutional capacity underpinned its demise. The tourism group's expansion along Negril's coast and its interior was underpinned by the relative power of the Urban Development Corporation and the creation of a tourism workforce.

In contrast, the sugar group, with its backward and forward linkages to political parties and foreign markets, struggled to capitalize on its control of more than 70% of the protected area's arable lands. Moreover, even as the *National Land Policy (1996)* made sugar cane farmlands sacrosanct, a significant shortage in field labor left the protected area's sugar estates in decline. Sugar cane farmers' inability to maintain institutional capacity is underpinned by its inability to employ and retain sugar cane field workers. This difference between the sugar and tourism groups is in many ways a reflection of the changes in Negril's demographic structure.

With increased access to high school and trade school education, fewer of Negril's population are willing to settle for sugar cane fieldwork. In general, the semi-structured interviews showed that although older members of Negril's population were closely allied with the sugar industry, they preferred alternative forms of employment for their children. In implementing broad socioeconomic policies, the national government aimed to satisfy the needs of Negril's broader population rather than those of niche populations. Thus, participatory-planned conservation policies are not given priority when they are counter to national development interest.

By examining the complexity of implementing the participatory-planned conservation policies in Negril's postcolonial and non-colonial socioeconomic and political landscape, this research extends the discourse on protected areas from large, relatively low populated areas to the complex geographic landscapes that currently

describe some newer protected areas. Most importantly, building on geographer Piers Blaikie's work, this research shows that in some developing countries, institutional capacity that is characterized by the relative power of groups and demographic changes is the primary factor that influences protected areas' natural resource use.



**APPENDIX A**

**THE CONSERVATION AND DEVELOPMENT POPULATION SURVEY**  
THE NEGRIL ENVIRONMENTAL PROTECTION AREA, WESTERN JAMAICA

**PLEASE USE A PEN TO COMPLETE THIS SURVEY**

**PART I: CONSERVATION**

1. What do you think is Negril's **MOST** significant environmental problem? **Please circle one answer.**

- |                   |                  |                              |
|-------------------|------------------|------------------------------|
| 1. Drought        | 2. Beach Erosion | 3. Damage to the Coral Reefs |
| 4. Fish Depletion | 5. Other _____   | 9. Don't Know                |

3. What do you think is the **most significant human cause** of Negril's environmental problem? **Please circle one answer.**

- |                       |                      |                   |
|-----------------------|----------------------|-------------------|
| 1. Water Sports       | 2. Fishing Equipment | 3. Fertilizer Use |
| 4. Hotel Construction | 5. Other _____       | 9. Don't Know     |

3. How much do you think that the protected area's conservation policies have changed Negril's environment? **Please circle one answer.**

- |              |                    |                     |               |
|--------------|--------------------|---------------------|---------------|
| 1. Improve   | 2. Almost improve  | 3. Somewhat improve |               |
| 4. No change | 5. Somewhat worsen | 6. Worsen           | 9. Don't Know |

**END OF PART 1**

**PART II: DEVELOPMENT**

**About how many people from your district work in the following industry...**

	All	More than half	About half	Less than half	Almost none	None	DON'T KNOW
4. Fishing?	1	2	3	4	5	6	9
5. Sugar?	1	2	3	4	5	6	9
6. Tourism?	1	2	3	4	5	6	9
<b>7. OTHER?:</b>	1	2	3	4	5	6	9

**About, how much of your FAMILY'S income is earned in the \_\_\_\_\_ industry?**

	Almost all	More than half	About half	Less than half	Almost none	None	DON'T KNOW
8. Fishing	1	2	3	4	5	6	9
9. Sugar	1	2	3	4	55 5	6 6	8 9
10. Tourism	1	2	3	4	5	6	9
<b>11. OTHER:</b>	1	2	3	4	5	6	9

\_\_\_\_\_

**About, how often do you think of working in the \_\_\_\_\_ industry?**

	Everyday	Almost every day	At least once per week	A few times her month	At least once per month	Never	Already work in the industry
12. Fishing	1	2	3	4	5	6	8
13. Sugar	1	2	3	4	5	6	8
14. Tourism	1	2	3	4	5	6	8
<b>15. OTHER:</b>	1	2	3	4	5	6	8

\_\_\_\_\_

In the past 10 years, how much do you think that the \_\_\_\_\_ industry has changed?

	Sign Incr.	Increased	Slightly increased	No change	Slightly decreased	Decreased	Sign Decr.	DON'T KNOW
16. Fishing	1	2	3	4	5	6	7	9
17. Sugar	1	2	3	4	5	6	7	9
18 Tourism	1	2	3	4	5	6	7	9
<b>19 OTHER:</b> _____	1	2	3	4	5	6	7	<b>9</b>

What do you think about changes in the \_\_\_\_\_ industry?

	Best for Negril	Very good for Negril	Good for Negril	Somewhat good for Negril	Not so good for Negril	Not very good for Negril	Bad for Negril	Don't Know
20. Fishing	1	2	3	4	5	6	7	9
21. Sugar	1	2	3	4	5	6	7	9
22. Tourism	1	2	3	4	5	6	7	9
<b>23. OTHER:</b> _____	1	2	3	4	5	6	7	9

In the next 10 years, how much do you think that the \_\_\_\_\_ industry will change?

	Sign. Incr.	Increased	Slightly increased	No change	Slightly decreased	Decreased	Sign. Decr.	Don't Know
24. Fishing	1	2	3	4	5	6	7	9
25. Sugar	1	2	3	4	5	6	7	9
26. Tourism	1	2	3	4	5	6	7	9
<b>27 OTHER</b> _____	1	2	3	4	5	6	7	9

28. In the past 10 years, which of the following groups do you think will have the greatest influence on changes in Negril?

**Rank your answers from 1 to 7, where 1 is most influential and 7 is least influential. Use 9 for 'Don't Know'**

- \_\_\_ Conservation Agencies: NEPA, NEPT, NCRPS
- \_\_\_ The Negril Chamber of Commerce
- \_\_\_ The Negril Fishermen's Cooperative
- \_\_\_ Sugar Cane Groups: SCJ (Frome), Cane Farmers Assoc. Sugar Industry Authority
- \_\_\_ Tourism Groups: JHTA, TPDCo
- \_\_\_ The Urban Development Corporation (UDC)
- \_\_\_ Other \_\_\_\_\_
- \_\_\_ Don't Know

29. In the next 10 years, which of the following groups do you think will have the greatest influence on changes in Negril?

**Rank your answers from 1 to 7, where 1 is most influential and 7 is least influential. Use 9 for 'Don't Know'**

- \_\_\_ Conservation Agencies: NEPA, NEPT, NCRPS
- \_\_\_ The Negril Chamber of Commerce
- \_\_\_ The Negril Fishermen's Cooperative
- \_\_\_ Sugar Cane Groups: SCJ (Frome), Cane Farmers Assoc. Sugar Industry Authority
- \_\_\_ Tourism Groups: JHTA, TPDCo
- \_\_\_ The Urban Development Corporation (UDC)
- \_\_\_ Other \_\_\_\_\_
- \_\_\_ Don't Know

**END OF PART II**

**Finally, a few questions about you:**

**P1** In what year were you born? 19\_\_

**P2** About how long have you lived in the Protection Area?

1. Less than 5 years   2. 5 – 10 years   3. 11 – 15 years   4. 16 – 20 years   5. 21+ years

**P3** About how much land does your **FAMILY** own in the Protection Area?

1. Less than 5 acres   2. 5 – 10 acres   3. 11 – 15 acres   4. 16 – 20 acres

5. 21 – 25 acres   6. 26+ acres

**P4** Is your education level

1. Primary   2. Some secondary/trade schools   3. Secondary/trade school graduate

4. Some college   5. College graduate   6. Graduate school?

**P5** Is your **average** monthly income (Jamaican\$)

1. Less than or equal to \$20,000   2. \$20,100 – 25,000   3. \$25100 - 30,000

4. 30,100 – 35,000   5. \$35,000+?

**P6** 1. MALE   2. FEMALE

***These are all our questions. Thank you for your time.***

**END OF PART III**

**APPENDIX B**

**THE CONSERVATION AND DEVELOPMENT SEMI-STRUCTURED INTERVIEWS**  
THE NEGRIL ENVIRONMENTAL PROTECTION AREA, WESTERN JAMAICA

**PART I: CONSERVATION**

1. What do you think is Negril's **MOST** significant environmental problem? ....you said .....

.....How did you decide?

2. What do you think is the **most significant human cause** of Negril's environmental problem? .....you said.....

....Why?

**3** How much do you think that the protected area's conservation policies have changed Negril's environment?

PART II: DEVELOPMENT

4. Roughly, in which of the following industries do the people from your district work?

4. Roughly, how much of your FAMILY'S income is earned in the fishing, sugar or tourism industry?...any other industry?

6. How often do you think of working in the fishing industry?...why?

Sugar?...why?

Tourism?.....why?

7. In the past 10 years, how much do you think that the fishing industry has changed?

How?

Why?



Sugar?...how? why?

Tourism?...why?

8. What do you think about the change in the fishing industry?...why?

Sugar industry?...why?

Tourism industry?...why?

9. In the past 10 years, which group do you think had the greatest influence on changes in Negril? .....why?

10. In the next 10 years, which group do you think will have the greatest influence on changes in Negril? ...why?

*These are all our questions. Thank you for your time.*

**APPENDIX C**

<p align="center"><b>THE NEGRIL ENVIRONMENTAL PROTECTION AREA</b>  <b>THE MAJOR ECONOMIC DEVELOPMENT POLICIES/AGREEMENTS/LAWS/INCENTIVES</b>  <b>1990 - 2005</b></p>			
<b>INDUSTRY</b>	<b>POLICY/AGREEMENT</b>	<b>PERIOD</b>	<b>GENERAL PURPOSE</b>
Sugar	The African, Caribbean and Pacific Countries/Lomé IV Agreement	1990 - 1995	Export and price guarantees
	The African, Caribbean and Pacific Countries/Lomé IV Agreement, Part 1	1995 - 2000	Renewal of the above
	The African, Caribbean and Pacific Countries/Lomé IV Agreement, Part 2	2000 - 2020	Renewal of the above
	The National Land Policy	Indefinitely	The non-conversion of agricultural land for other types of development
Tourism	<i>The Hotels (Incentives) Act (1968)</i> <sup>123</sup>	Indefinitely	To stimulate foreign investment through concessions
	<i>The Resort Cottages (Incentives) Act (1971)</i>	Indefinitely	To stimulate national investment through concessions
	The Negril Development Plan, 1994	1994 - 2000	Primarily to increase the number of rooms
	The Master Plan for Tourism, 2000	2000 - 2010	Same as above
	<i>Caribbean Basin Economic Recovery Expansion Act of 1990, Title II: The Customs and Trade Act of 1990</i>	1990-2000	To promote economic stability and growth by encouraging foreign investment in the tourism industry
	<i>The Caribbean Basin Trade Partnership Act (CBPTA), 2000</i>	2000-2010	Renewal of the above

Sources:

African Caribbean and Pacific Countries (ACP) Sugar Protocol (1974).  
 Commonwealth Secretariat (2000).  
 Government of Jamaica (1968a).  
 Government of Jamaica (1971).  
 Government of Jamaica (1996).  
 The Urban Development Corporation (1994).  
 Caribbean Basin Economic Recovery Act of 1983, P.L. 98-67, 97 Stat. 384.  
 Caribbean Basin Economic Recovery Expansion Act of 1990, Title II: The Customs and Trade Act of 1990, P.L. 101-382, 104 Stat 629.  
*Caribbean Basin Trade Partnership Act (CBPTA), 2000*. P.L. 111-382, 107 Stat 741.

Note:

Revisions to the ACP Sugar Protocol began in 2005 due to protests from the United States, Australia and Brazil regarding the structure of the European Union's Common Organization of Markets (COM) for sugar. It is feared that changes in this protocol will negatively impact the protected area's sugar industry (R. Clarke 2003, 2004).

<sup>123</sup> The Minister of Tourism may extend the concession period for any or all to 15 years.

## APPENDIX D

Frome Sugar Factory's <b>Raw Sugar</b> (96°) Production in relation to Jamaica's <b>Raw Sugar</b> (96°) Production & Export 1990/1991-2004/2005 ( <sup>000</sup> metric tonnes)								
Year	Frome Sugar Factory	Jamaica	Total Exports	EU Protection	Britain*	U.S.** Protection	Total Protected Exports	Total Unprot. Exports
1990/1991	93	241	183	126	21	12	159	24
1991/1992	86	232	179	126	21	11	158	21
1992/1993	84	230	179	126	21	10	157	22
1994/1995	76	221	168	126	21	9	146	22
1995/1996	73	242	181	126	21	12	159	22
1996/1997	71	243	171	126	21	12	159	12
1997/1998	68	196	168	126	21	12	159	9
1998/1999	69	204	178	126	21	11	159	19
1999/2000	65	226	169	126	21	12	159	10
2000/2001	63	203	179	126	21	11	158	21
2001/2002	62	187	167	126	21	10	158	9
2002/2003	59	163	161	126	21	9	156	5
2003/2004	63	171	162	126	21	11	158	4
2004/2005	62	168	162	126	21	11	158	4

Sources:

ACP: Text for Lomé IV (1990-1995): Part 1

ACP: Text for Lomé IV (1995-2000): Part 2

ACP: Cotonou Agreement (2000-2020).

Statistics Institute of Jamaica (STATIN), External Trade Bulletin (various issues)

Sugar and Sweetener Outlook and Situation Report (various issues).

The Sugar Industry Authority: The Sugar Industry Research Institute

United States Department of Agriculture: Foreign Agricultural Service

Notes:

\*The 21,000 tonnes listed separately for Great Britain is not a part of the EU quota.

\*\* US sugar quota is subject to a tariff-rate quota. A tariff-rate quota is an import policy that allows countries to ship specified quantities of a product to the United States at a relatively low tariff, but subjects all other imports of that product to a higher tariff. Jamaica receives an additional in-tariff quota of 3, 018 tonnes.

**APPENDIX E**

The European Union Basic Intervention Price and the United States & World Raw and Refined Sugar Prices 1990/1991-2004/2005 (U.S. cents/lb)					
Marketing Years	EU Intervention	U.S. Raw	U.S. Refined	World Raw	World Refined
1990/1991	30.67	23.26	29.97	12.55	17.32
1991/1992	33.24	21.57	25.65	9.04	13.41
1992/1993	33.16	21.31	25.44	9.09	12.39
1993/1994	28.33	21.62	25.15	10.03	12.79
1994/1995	28.9	22.04	25.15	12.13	15.66
1995/1996	28.50	22.96	25.83	13.44	17.99
1996/1997	30.88	22.40	29.20	12.24	16.64
1997/1998	30.16	21.96	27.09	12.06	14.33
1998/1999	29.69	22.06	26.12	9.68	11.59
1999/2000	28.74	21.16	26.71	6.54	9.10
2000/2001	29.93	19.09	20.80	8.51	9.97
2001/2002	28.03	21.11	23.31	9.12	11.29
2002/2003	31.11	20.87	25.79	7.88	10.35
2003/2004	29.69	21.42	26.21	7.51	9.74
2004/2005	28.03	20.46	23.48	8.61	10.87

## Sources:

Eurostat – Basic Statistics of the European Union (various issues).

International Sugar Organization (ISO) Yearbook (various issues).

London Daily Price, Futures and Options Exchange, f.o.b. European ports, Contract No. 5.

New York Coffee, Sugar & Cocoa Exchange, Inc., Contract No. 11, f.o.b. Caribbean ports.

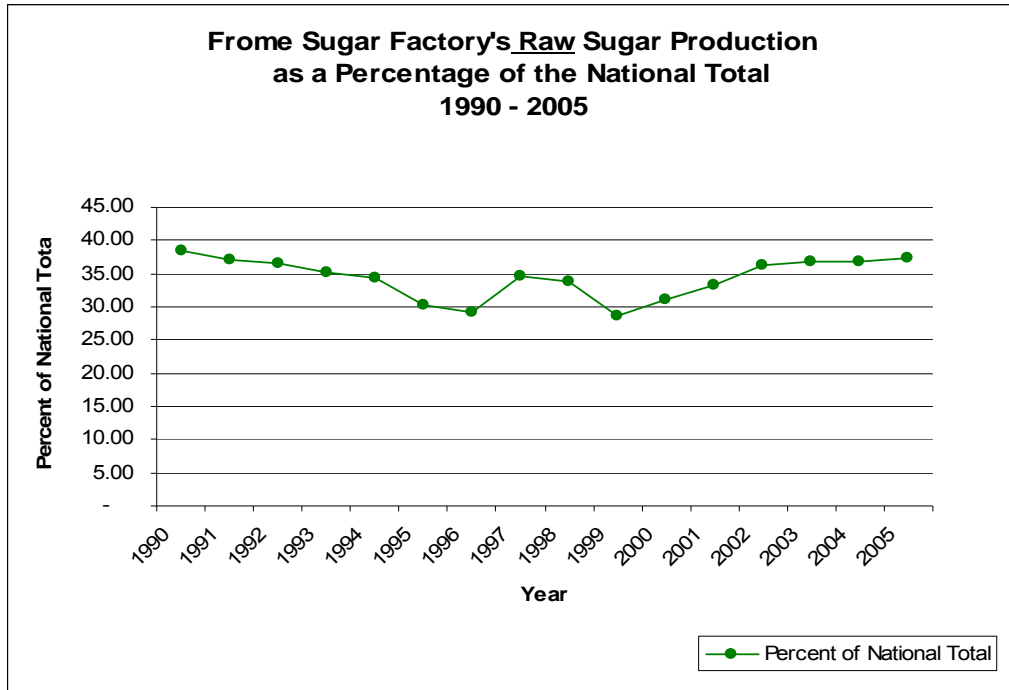
New York Coffee, Sugar & Cocoa Exchange, Inc., Contract No. 14, (before 1986, Contract No. 12) c.i.f. duty/fee paid.

USDA, Economic Research Services, Sugar and Sweetener Outlook and Situation Reports (various issues).

## Notes:

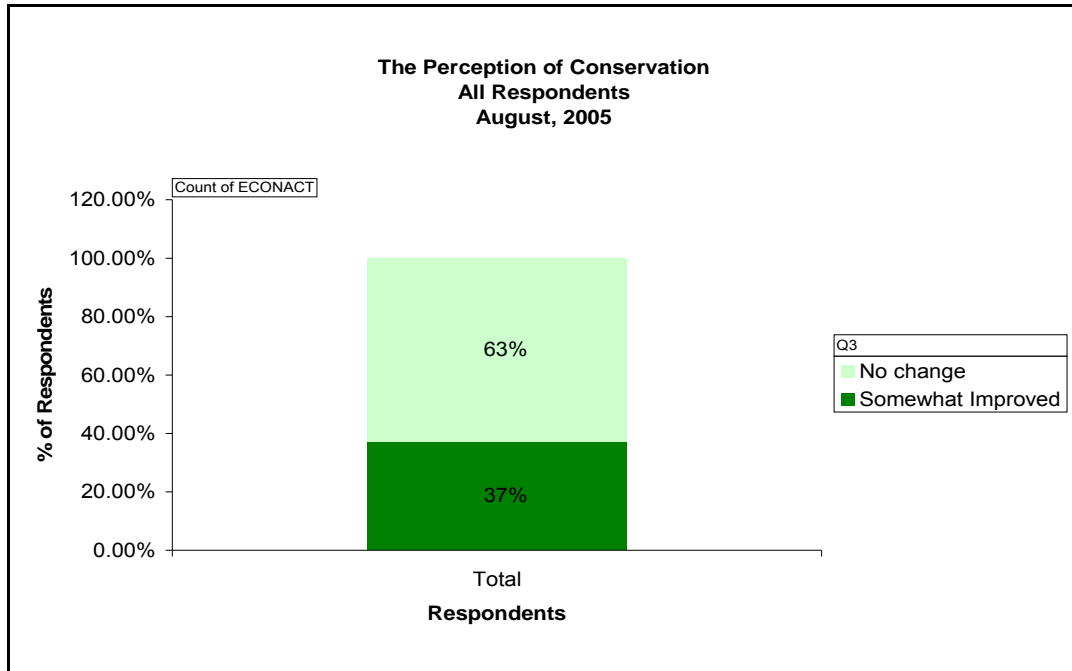
1. EU price is the basic intervention price for refined sugar. The Intervention price is the minimum price for sugar. The minimum price for sugar is that which sugar manufacturers are required to pay beet growers. It is set by the EU's Common Market for Sugar (COM). This price has been frozen at €631.90 (US\$792.21) per tonne for refined sugar, and €523.70 (approx US\$656.56) per tonne for raw sugar since 1993/1994. Signatories to the ACP Sugar Protocol received the EU's raw sugar intervention price during the study period.
2. EU prices that are quoted in ecu/100kg and Euro/tonne were converted to U.S. cents per lb to conform to U.S. and World prices. Conversion rates: Eurostat – Basic Statistics of the European Union (various issues) & The Bank of Canada: 10 Year Rates Look Up.
3. 1 tonne = 1,000kg = 2205 lbs

**APPENDIX F**



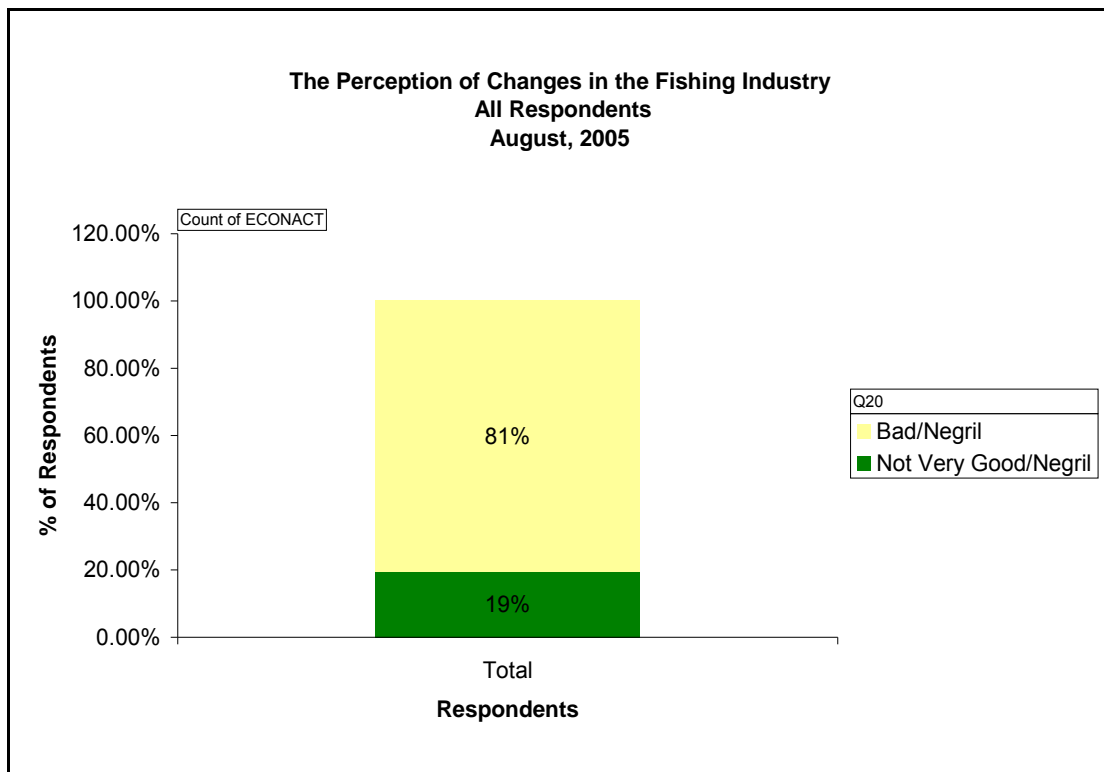
Source: The Sugar Industry Authority: The Sugar Industry Research Institute, Annual Reports (1990 to 2005). Also see Appendix D.

**APPENDIX G**



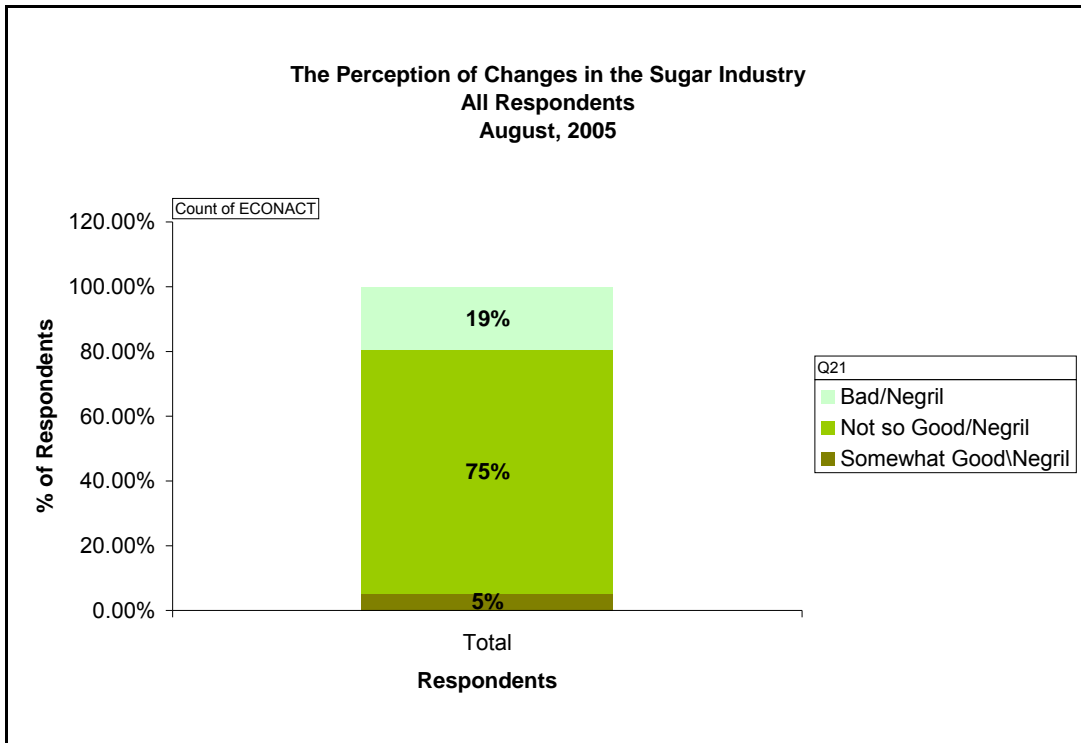
Source: The Conservation and Development Population Survey (Appendix A, Question 3).

Note: The results are accurate to within a 94% confidence interval.

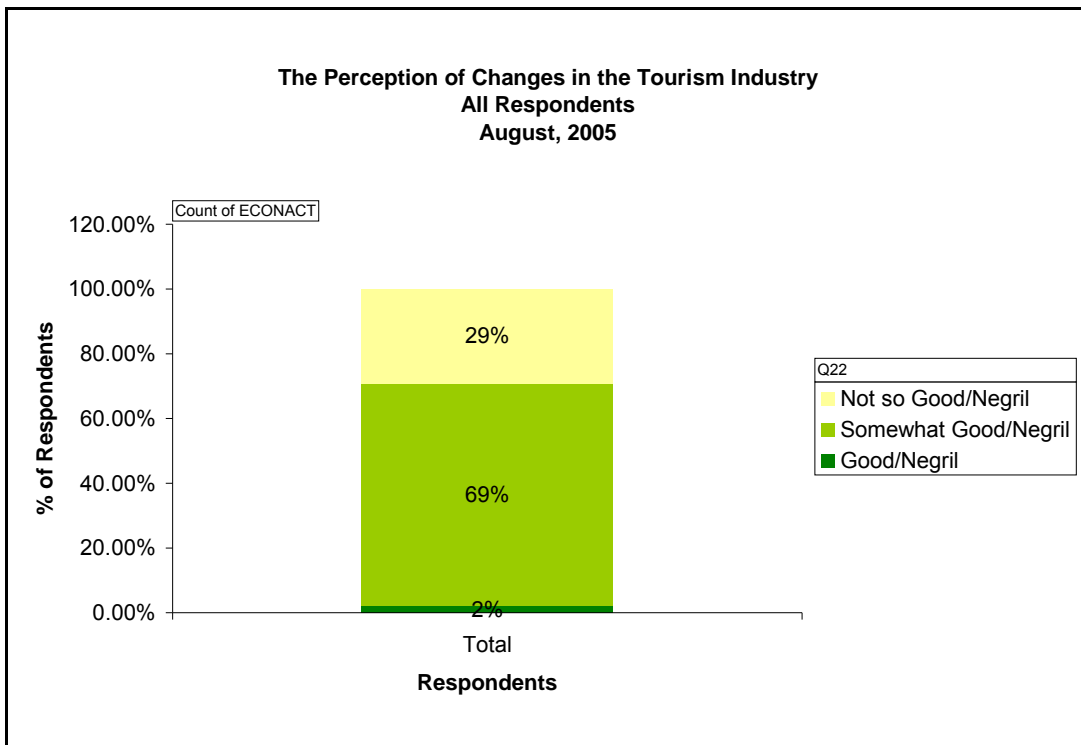


Source: The Conservation and Development Population Survey (Appendix A, Question 20)

Note: The results are accurate to within a 94% confidence interval.



Source: The Conservation and Development Population Survey (Appendix A, Question 21)  
 Note: The results are accurate to within a 93% confidence interval.



Source: The Conservation and Development Population Survey (Appendix A, Question 22)  
 Note: The results are accurate to within a 92% confidence interval.



## APPENDIX H

**Table A1**

THE PERCEPTION OF CONSERVATION THE TEST OF GROUP MEANS FOR THE FISHING RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
EDUC	.867	6.734	1	44	.013
AGE	.952	2.228	1	44	.143
YRSRES	.974	1.196	1	44	.280
INCOME	.999	.063	1	44	.803
GENDER	1.000	.004	1	44	.951
LAND	1.000	.001	1	44	.978

Source:

The SPSS Stepwise Discriminant Analysis on Question 3's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

1. Recall that  $df1 = m - 1$ , where  $m$  is the number of groups

2. Recall that  $df2 = p - m$ , where  $p$  is the number of predictor variables and  $m$  is the number of groups

**Table A2**

THE PERCEPTION OF CONSERVATION THE TEST OF GROUP MEANS FOR THE SUGAR RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
AGE	.726	16.260	1	43	.000
EDUC	.943	2.623	1	43	.113
YRSRES	.961	1.763	1	43	.191
INCOME	.997	.146	1	43	.704
LAND	.998	.092	1	43	.763
GENDER	.999	.055	1	43	.816

Source:

The SPSS Stepwise Discriminant Analysis on Question 3's Responses (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

**Table A3**

THE PERCEPTION OF THE DECLINE IN THE FISHING GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE FISHING RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
YRSRES	.947	2.479	1	44	.123
GENDER	.978	.999	1	44	.323
LAND	.987	.973	1	44	.329
AGE	1.000	.015	1	44	.904
EDUC	1.000	.008	1	44	.931
INCOME	1.000	.001	1	44	.972

Source:

The SPSS Stepwise Discriminant Analysis on Question 20's responses (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

\*\*\*Because 100% of the *a priori* sugar respondents thought that the decline in the fishing group's available jobs was *bad for Negril*, there is no within group discriminant analysis of sugar respondents.\*\*\*

**Table A4**

THE PERCEPTION OF THE DECLINE IN THE FISHING GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE TOURISM RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
INCOME	.599	27.415	1	41	.000
GENDER	.960	1.701	1	41	.199
EDUC	.979	.867	1	41	.357
LAND	.989	.475	1	41	.494
AGE	.993	.272	1	41	.605
YRSRES	1.000	.007	1	41	.935

Source:

The SPSS Stepwise Discriminant Analysis on Question 20's responses (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

**Table A5**

THE PERCEPTION OF THE INCREASE IN THE SUGAR GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE FISHING RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
AGE	.733	16.036	1	44	.000
GENDER	.981	.840	1	44	.364
INCOME	.985	.652	1	44	.424
YRSRES	.988	.517	1	44	.476
EDUC	.996	.171	1	44	.681
LAND	.996	.165	1	44	.687

Source:

The SPSS Stepwise Discriminant Analysis of Fishing Respondents' Question 21 responses of *not so good for Negril* and *somewhat bad for Negril* (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

**Table A6**

THE PERCEPTION OF THE INCREASE IN THE SUGAR GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE SUGAR RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
LAND	.961	.808	2	42	.453
YRSRES	.973	.549	2	42	.582
AGE	.975	.511	2	42	.604
INCOME	.985	.298	2	42	.744
GENDER	.997	.065	2	42	.937
EDUC	.997	.063	2	42	.939

Source:

The SPSS Stepwise Discriminant Analysis of Tourism Respondents' Question 21 responses of *not so good for Negril*, *somewhat good for Negril* and *good for Negril* (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

**Table A7**

THE PERCEPTION OF THE INCREASE IN THE SUGAR GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE TOURISM RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
AGE	.568	117.293	1	41	.000
EDUC	.579	40.205	1	41	.000
YRSRES	.797	10.952	1	41	.002
LAND	.893	5.128	1	41	.029
GENDER	.996	.184	1	41	.670
INCOME	1.000	.014	1	41	.907

Source:

The SPSS Stepwise Discriminant Analysis of Sugar Respondents' Question 21 responses of *not so good for Negril* and *bad for Negril* (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

**Table A8**

THE PERCEPTION OF THE INCREASE IN THE TOURISM GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE FISHING RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
AGE	.509	42.442	1	44	.000
YRSRES	.949	2.355	1	44	.132
EDUC	.972	1.251	1	44	.270
GENDER	.986	.620	1	44	.435
INCOME	.990	.427	1	44	.517
LAND	.995	.233	1	44	.631

Source:

The SPSS Stepwise Discriminant Analysis of Fishing Respondents' Question 22 responses of *not so good for Negril* and *somewhat food for Negril* (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05

The maximum significance of F to remove for each variable is .10

**Table A9**

THE PERCEPTION OF THE INCREASE IN THE TOURISM GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE SUGAR RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
AGE	.563	33.357	1	43	.000
YRSRES	.679	20.314	1	43	.000
EDUC	.813	9.892	1	43	.003
GENDER	.907	4.424	1	43	.041
INCOME	.992	.335	1	43	.566
LAND	1.000	.000	1	43	1.000

Source:

The SPSS Stepwise Discriminant Analysis of Sugar Respondents' Question 22 responses of *not so good for Negril* and *somewhat food for Negril* (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05  
The maximum significance of F to remove for each variable is .10

**Table A10**

THE PERCEPTION OF THE INCREASE IN THE TOURISM GROUP'S AVAILABLE JOBS THE TEST OF GROUP MEANS FOR THE TOURISM RESPONDENTS ONLY					
	Wilks' Lambda	F	df1	df2	Sig.
AGE	.612	12.695	2	40	.000
LAND	.820	4.386	2	40	.019
INCOME	.892	2.411	2	40	.103
EDUC	.920	1.743	2	40	.188
YRSRES	.945	1.166	2	40	.322
INCOME	.998	.036	2	40	.964

Source:

The SPSS Stepwise Discriminant Analysis of Tourism Respondents' Question 22 responses of *not so good for Negril*, *somewhat food for Negril* and *good for Negril* (Appendix A: The Conservation and Development Population Survey).

Notes:

The maximum significance of F to enter for each variable is .05  
The maximum significance of F to remove for each variable is .10

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