PLANNING AND MANAGEMENT OF LAND RESOURCES IN MONTSERRAT

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Introduction

This slightly unusual experimental assessment is based on an intensive but brief reconnaissance survey of Montserrat's natural resource base and overlying economic system. The objective was to improve our understanding of how Montserrat's natural resources figure in the day-to-day life of the country and its patterns of growth and development, both in the short run and in the longer term. The issue of sustainability of various land uses lies at the core of these investigations. The basic questions looked fairly simple and straightforward:

- Was there any way to measure or estimate the value of various "important", widely used, natural resources?

- For an important or highly productive resource could we link any degradation with social or economic loss or treat any management or policy derived enhancement as an economic gain or "public sector investment"?

- Can we identify any important resources that appear to be at risk, or face inadvertent damage, accelerated depletion, or direct destruction? Can we quantify real or projected "system" losses? Real? Imputed? Permanent? Projected? Discounted?

- What can be adjusted or changed in the national income accounts or present resource management framework that would highlight important natural resource system inputs customarily taken for granted or treated as free goods? Is it worth the effort?

The pursuit of even preliminary responses to these innocently sounding, beguilingly difficult questions has consumed, for all three investigators, an unconscionably prolonged period of time. Dead ends were everywhere, and trustworthy data proved to be exceedingly elusive. Models metaphorical and models mathematical failed alike to "work" as simplifying or analytical devices producing only more complexity, frustration and the customary contradictions one finds under the surface in all man-environment relationships. Alas, since funding was not available for a sequence of return visits by the research team to Montserrat, it gradually became obvious to all that the best we could hope to accomplish was:

(1) a description of existing resource uses,
(2) an assessment of resource exploitation and degradation,
(3) an estimate of any such depletion as a factor in current, short-term production and income levels,
(4) tentative suggestions for policy changes to reduce the proportion of nonsustainable uses, and
(5) possibly the design of a more focused research agenda.

Chapter One

The Economic Base

THE GEOGRAPHICAL SETTING

Montserrat is a very small rugged, volcanic island of recent geologic origin located along the inner Lesser Antillean ridge some 27 miles southwest of Antigua and 17 miles southeast of Nevis. It is pear-shaped and approximately thirty-nine and a half square miles (103 square kilometers) in area. The nearest land mass is Redonda rock, a steep-sided, uninhabited half square mile pinnacle visible on the horizon to the northwest, approximately half way between Montserrat and Nevis. The so-called "Emerald Isle" has, on its north south axis, a linear system of prominent, heavily forested hills, peaking in the extreme north at Silver Hill (1285 ft., 392 m.), in the center at Katy Hill (2450 ft., 747 m.) and in the south at Chances Peak (3002 ft., 914 m.) (ECNAMP, 1980).

The island contains few mineral resources other than construction aggregate and possesses a fairly harsh coastline of 32 kilometers of rocky shoreline, mostly cliffs, and about 13 kilometers of narrow, mostly black magnetite sand beaches with a modest 108 square kilometer submerged shelf and a sharp, bold drop off to 100 fathoms less than one mile from the shoreline in the south and about two miles from the shoreline to the northeast, north and west. A singular, notable tongue of sandy sediments extends a mile and a half west from Bransby Point and constitutes the only accessible source of mineable marine sand. There are no natural harbors, and very few coral reef assemblages (due in part to the narrowness of the inshore shelf) which normally provide a natural barrier to storm waves and ocean swells. The high energy coastline, therefore, offers little prospect of safe anchorages for yachts and vessels, and even small fishing boats must be hauled up on the limited number of narrow beach zones for protection against the action of the sea under even fairly calm conditions.

The territory's tropical maritime climate produces a moderate mean annual temperature of 79 degrees F (26 degrees C) and variable rainfall peculiar to the steep irregular topography, shape, and small size of Montserrat. These fluctuations include variations between sea level and upland (1200 ft.) areas of roughly 40 to 80 inches per year, respectively, with typically 10 inches difference at the same altitude favoring leeward over windward locations (Corker, 1986). Annual average rainfall variation can also be severe, fluctuating, for example, between 80 inches in 1982 to 50 inches in 1983 (OECS Digest, 1986). Montserrat remains seismically active (there were minor earthquakes recorded in 1966, 1967 and 1985), and the volcano which created the island over time is not dead but dormant as the south Soufriere Hills still have active steam and sulphurous gas vents and hot springs.

HISTORY

Traditional land-use patterns were based on plantation monoculture and the familiar legacy of chronic post-emancipation emigration followed by a series of unsustainable agricultural export revivals (Corker, 1980). In particular, sugar output peaked in 1880 beset by soil exhaustion, unproductive tenancy, and resource disinvestment practices and foreign competition. Production became negligible after a 1928 hurricane. Limes (and lime juice) replaced sugar and peaked in the early 1900's at about the 1000 acre level, thereafter plagued by persistent pests, diseases, hurricanes and wartime shipping interruptions. Finally, long staple cotton production replaced both sugar and limes and lime juice as the dominant export crop and expanded steadily until 1941 when over 1 million pounds were produced on 5,400 acres, over half the theoretically arable land in Montserrat. However, undercapitalization, high production costs, and the pressures of foreign competition gradually eroded this market niche until a major labor dispute in 1955 caused virtual collapse of the industry and (in one year) the emigration of nearly ten percent of the total insular labor force.

POST-WAR MODERNIZATION

Since 1960 the economy has undergone major restructuring away from traditional agricultural staples toward a more income-elastic, sustainable and diversified base: export manufacturing, tourism, related construction and expanded public and private services. This transformation was sparked by North American tourists' discovery of Montserrat in the early 1960's and the subsequent gestation of a real estate boom based initially on retirement home construction. Secondary waves of activity, financed largely by off-island investors, foreign aid and emigrant remittances, included expansion in hotel capacity, infrastructure, and new residential construction culminating in the establishment of an offshore U.S. medical school "campus" begun in the late 1970's.

This post-War restructuring is most visibly apparent from the summary employment data assembled and presented in Table 1. These figures trace the sharp fall off in rural activity since 1970 (i.e., from 20% down to 10% of the total) along with a more-than-doubling of visitor arrivals and the parallel redeployment of labor into the expanding export sectors of tourism/manufacturing/construction and public/private services. During this period of static population and sustained emigration, the data further point to significant increases in labor force participation. It is noteworthy that between 1970 and 1985 the labor force, i.e., the economically active share of the total population, rose dramatically from 33 to 45 percent.

Table 1. Montserrat Employment Pattern, 1970-1985 (percentages in parentheses).

	1970	1980	1985
Agriculture/Fishing	744 (20)	476 (10)	500 (10)
Manufacturing/Tourism/ Construction, etc.	1731 (47)	2117 (46)	2380 (49)
Government/Other Services	1118 (32)	1981 (43)	2170 (41)
Total Employment	3663 (100)	4574 (100)	5050 (100)
Labor Force	3838	4872	5330
Population	11,458	11,606	11,852
Participation Rate (LF/pop)	33%	42%	45%
Visitor Arrivals (for comparison)	11,781	20.483	24,626

Source: 9th Statistical Digest, 1984, supplemented by preliminary 10th edition figures.

As a result of this diversification and modernization, the economy has achieved a degree of stability and affluence that clearly contrasts with the boom and bust cycles associated with the colonial agricultural experience. As shown in Table 2 during the decade from 1970 to 1980, GDP and GDP per capita grew at simple annual rates between 2 to 3 percent. This growth clearly stimulated a filtering down process as indicated by an improvement in income equality (i.e., a reduction in the Gini Coefficient) and generalized increases in durables consumption, housing quality, and self-investment in education and training. These developments include 50 to 60 percent increases in vehicle purchases and per capita electricity consumption, a doubling of homes with indoor running water and toilet facilities, and a 13 percentage point rise in the share of concrete/stone/brick housing. In addition, university and vocational training doubled and tripled respectively.

These positive economic trends produced predictable but marked demographic shifts discontinuous with past patterns. These included a

Table 2. Montserrat Selected Development Indicators, 1970 -1980.

	1970	1980
GDP (EC$M, 1977 prices)[1]	$31	$44
GDP per capita (EC)[1]	$2,672	$3,544
Gini Coefficient[2]	0.43	0.39
Registered Vehicles	1,122	1,720
Per Capita Kwhs Electricity	732	1,181
% Concrete/Stone/Brick Houses	25	38
% with indoor water	26	53
% with flush toilets	25	49
% Adults with University training	2.1	4.5
% Adults with vocational training	5	17
% Population 15-64[1]	49	59
Male Sex Ratio	88	94[4]
Dependency Ratio	102	69[4]
Crude Birth Rate (per 000's)	26	19
Crude Death Rate (per 000's)	11	9
Average Annual Net Migration[3]	-172	-24
Average Annual Population Change[3]	-1.0	0.9

Sources: See Table 1.

1 For 1975 and 1985 respectively.

2 1970 and 1975. This is an index of income inequality.

3 For 1974 through 1979 and 1980 through 1985.

4 1986.

10 percent increase in the working age population (15-64) between 1975 and 1985, a visible rise in the sex (male) ratio, and a very sharp drop in the dependency ratio, i.e., the proportion of economically inactive persons (under age 15 and over 64) to active (age 15 to 64) components of the population. These visible indicators of increased participation in an expanding economy have produced historically uncharacteristic reversals in basic demographic movements as reflected in reduced emigration and increased growth. For example, between the 1974-1979 and 1980-1985 periods annual average net emigration fell sharply from 172 to 24 and total population reversed from a one percent yearly decrease to a one percent increase.

THE CONTEMPORARY ECONOMY

The character of the contemporary economy contrasts with that of the past in three ways: (1) relative affluence, (2) a more diversified export base and (3) an altered pattern of environmental resource use. The relative regional prosperity of Montserrat popularly proclaimed fifteen years ago (Advocate-News, 1973) is clearly still evident in comparative OECS data for 1983. According to Table 3, Montserrat enjoys the lowest population density and the highest per capita GDP (EC $7,140) of any of its six neighbors. By comparison, Antigua is $4,659. In health services delivery, the island exhibits the lowest infant mortality rate and the lowest (best) ratio of number of persons per resident doctor. In education, the territory has the second lowest student-teacher ratio at the secondary level. On the other hand, it has the highest levels of per capita tourist visitors (stayover and cruiseship), of recurrent government revenue, electricity generation, and automobile ownership. Such indicators also suggest that the economy is supported by strong social assets -- a relatively healthy and educated work force, a better than average physical infrastructure and an elastic fiscal capacity.

Second, because of its small size and limited resource base, Montserrat's economy is highly open and trade-dependent, namely export-propelled by tourism, manufactured exports, foreign investment, aid, and remittances while at the same time it is heavily supported by imports. Local observers suggest that a 1 percent increase in GDP is associated with a 1 percent increase in imports (Claeye, 1983). This open structure resembles, in its simplest form, the so-called export-base model developed for small urban economies whose growth depends upon exports to outside or "foreign" markets (with a resulting inflow of capital). It assumes that the export industries are the source and foundation of the standard of living of the city, region, or area (island), and therefore rightly called "basic."

In this model, the economy is broadly divided into two sectors: the basic or export sector and the non-basic or local sector that primarily services the consumption needs of workers in the export industries. The basic sector is further divided into direct export activities -- tourism, agricultural, manufacturing exports, etc. -- and indirect export activities that provide essential inputs and services to the direct export industries, i.e., wholesale suppliers of

Table 3. Recent OECS Socio-Economic Indicators, 1983.

	AN/B	DOM	GRE	MT	SKN	STL	STV
Pop. Density (per km2)	178	108	293	115	169	213	275
Per Capita GDP (1984)(EC$)	4,659	2,402	2,574	7,140	3,319	2,633	2,004
Infant Mortality (per 000's)	13.7	23.9	10.6	12.3	28.0	17.1	26.4
Persons/Doctor	2,524	3,010	2,394	1,956	2,522	2,577	NA
Staff/Pupil (Secondary)	1:12	1:22	1:21	1:14	1:16	1:16	1:17
Per Capita Total Visitor	1.4	0.3	0.3	1.6	0.8	0.6	0.8
Persons/Vehicle	8.3	12.0	13.9	6.5	8.8	12.4	12.7
Per Capita Elec. Gen.(kwh 000's)	784	229	221	1,111	709	529	295
Per Capita Recurrent Revenue(EC$)	1,130	879	761	1,896	1,193	850	745

Source: OECS Statistical Pocket Digest, 1985.

intermediate goods (hotel food), fuel, plus transport carriers, public utilities and infrastructure.

The operation of the export-base system is simple and direct and involves the exchange of export earnings for essential intermediate and final imported goods and services from export sector activity -- local sector activity. The key feature of the model is that export income drives the economy through induced secondary local spending and thus trade controls the overall level of activity. It is in this sense that local activities are simply the secondary consequences of export-propelled growth, since they supply the smaller market which feeds upon impulses communicated from export activity.

In his examination of small (populations of 50,000 to 100,000) U.S. cities, Thompson (1969) found that exports directly accounted for roughly 50 percent of income and employment and supported local activity on a one-to-one basis. This basic/non-basic relationship can be formalized as:

Total income/employment = export income/employment x B

where "B" is the base or export multiplier taking the form of:

$$B = \frac{1}{b}$$

where b is the proportion of total activity attributed to exports, or alternatively taking the form of:

$$B = \frac{1}{1 - L}$$

where L is the proportion of total activity attributed to local goods and services (Bendavid, 1974).

In Thompson's small-city case, the base multiplier is 2 (1/0.5). This means that every export dollar (or job) generates a total of $2 in GNP (2 total jobs).

The same value of 1.0 was obtained by McElroy (1978) in his application of the base model to the U.S. Virgin Islands, signifying that a 1 percent expansion in export activity gave rise to a corresponding 1 percent expansion in local sales and a 2 percent rise in total activity. Since these results paralleled work done on other mature urban economies of 100,000 inhabitants with relatively large local sectors, the base multiplier in the Montserrat case is expected to be considerably lower because of the extremely small scale of the resident population, the transitional character of recent modernization, and the heavy reliance on imports.

Developing the base or local multiplier for Montserrat requires identifying the direct and indirect export sectors and determining their respective contributions to GDP. This task is made difficult

because the distribution of GDP data by sectoral origin is not conveniently classified by export versus local domestic activity. Nevertheless, direct export sales can be fairly easily identified in the conventional GDP breakdown by Standard Industrial Classification (SIC codes). These include primarily manufacturing, hotel/restaurant businesses,and construction/mining activities since they are largely tourism-related and/or financed by off-island capital inflows (transfer payments in the form of worker's remittances/pensions, donor aid and private investment funds). Exports also account for a small share of agricultural production and an unrecorded amount of shipping and communications services. Direct exports also entail tourists' consumption of on-island services outside hotels/restaurants: trade, transport, communications, utilities and other services. This is calculated by estimating a share of total service activity consonant with tourists presence and residence on-island.

It is always much more difficult, however, to estimate the indirect export activities that supply essential goods/services to the primary export industries (Heilbrun, 1974). Problems are compounded because there is so little published information available on the structure of the Montserrat economy which would permit allocating an identifiable share of, for example, wholesale trade and/or electricity or water production to the export as opposed to the local sector. The estimation procedures are further complicated because, according to Claeye (1983), there is no standard system for estimating the balance of payments. As a result, for example, merchandise exports of manufactured and agricultural commodities are routinely inflated by 50 percent to account for unrecorded service exports like freight, insurance, cargo and passenger transport. Imported services are handled similarly. Yet these are precisely some of the service activities that indirectly support export trade and tourism.

To overcome these complications and retain simplicity, a one-to-one, direct-to-indirect rule of thumb was applied whereby every 1 percent of direct export activity was assumed to be supported by another 1 percent of indirect export business.

Table 4 presents a provisional construction of the direct export share of total GDP for 1985 employing relatively crude export allocation assumptions congruent with our rudimentary knowledge of the economy and with some of the rough and impressionistic procedures followed in the compilation of Montserrat's national income accounts. These rough assumptions assign all manufacturing, hotel/restaurant, and construction/mining activity to the direct export sector, plus 20 percent of agriculture, and an additional 20 percent to account for tourists' consumption of trade/transport/communication services and also of utilities and other services including government.

This 20 percent service figure is derived from bed-night/length-of-stay analysis of estimated visitor on-island residence during 1985. (see legend, Table 4). This analysis demonstrates that all tourists -- stopover, resident retirees from the mainland, and on-day excursionists -- represented 8 percent of the total resident and visitor population in 1985. It is further assumed that, because of visitors'

Table 4. Distribution of GDP by Sectoral Origin and Estimated Direct Export Shares, 1985.

	% GDP(1)	Export Allocation Ratio(2)	Direct Export Share of GDP
Agriculture/Fishing	4.4	0.20	0.9
Manufacturing	8.6	1.00	8.6
Construction/Mining	10.5	1.00	10.5
Hotel/Restaurant	2.7	1.00	2.7
Trade/Transport and Communications	25.5	0.20	5.1
Utilities,Govt. and Other Services	48.3	0.20(3)	9.7
TOTAL	100.0	-	37.5

(1) Source: Preliminary figures from the Statistics Office.
(2) Authors' estimates.
(3) This estimate of year-round tourism consumption is based on visitors' share of total bed nights (or resident days) in Montserrat in 1985. This percentage is determined in the following way:

Type of Resident	No.	Av. Stay	Total Nights
Resident	11,525	330	3,803,250
Stayover	16,500	14	231,000
Retirees	300	270	81,000
Cruise	7,050	1	7,050
TOTAL			4,122,300

Thus, the stayover, retiree and cruise visitor share (319,050) represents roughly 8 percent of the total.

relatively high income levels, holiday consumption standards, and affluent preferences for transport, maintenance-intensive appliances, shopping, etc., their service demand patterns were 2.5 times greater than local resident levels. This yields a total level of visitor demand for services of 20 percent (.08 x 2.5).

Employing these procedures to Montserrat's data produces a share of total GDP attributable to direct export activity of 37.5 percent. When the one-to-one direct-to-indirect rule of thumb is applied, this yields a very rough estimate of 37.5 of additional GDP in indirect export activity, and a total direct and indirect export sector comprising 75 percent of GDP. This seems rather high but reasonable in the context of the territory's pervasive dependence on off-island trade and capital inflows.

Using this 75 percent value in the base multiplier equation produces a GDP income multiplier of 1.33 (1/.75 or 1/1-.25). Loosely interpreted, this figure suggests that on the average a one dollar increase in export income -- from tourists, manufacture sales off-island, remittances, donor aid -- will expand GDP by approximately $1.33. It further suggests that three-fourths or one dollar ($0.75 x 1.33) of this new activity will occur in the export sector, while one-fourth or $0.33 ($0.25 x 1.33) will occur in the local sector.

While not unreasonable, this 1.33 figure is somewhat high for Caribbean tourist income multipliers as reported in Butari (1984). These more sophisticated formulations range between 1.36 for the Bahamas to 0.57 for the U.S. Virgin Islands. In fact, the actual Montserrat base multiplier may indeed be lower if, as in other remittance dependent economies, large unrecorded cash inflows occur either through the mail or are hand-carried by the large annual number of returning migrants.

The significance of the export base formulation and the derived base multiplier, despite its gross level of aggregation, lies in its conceptual simplicity for identifying the dominant drives in the system and in its policy utility for forecasting the overall macroeconomic activity from expected changes in the basic or export drives.

This usefulness is briefly demonstrated in a test of the accuracy of the derived base multiplier value of 1.33 for 1979-1983, the most recent years for which complete published national accounts data are available in final form (see World Bank, 1985). Following World Bank convention, Table 5 groups together export income into three sectors: (1) tourism expenditures and merchandise exports (both manufacturing and agricultural) so-named export of goods and non-factor services; (2) net transfers or primarily remittances from off-island workers and pension checks for retirees; and (3) capital inflows from private investors and from aid donors for facility and infrastructure construction, respectively. Island GDP or income (Y) is then simply

projected by applying the sum of these export income injections (E) against the base multiplier (B) in the export-base equation:

where $Y = E \times B$

Actual and projected figures are compared in Table 5. The data indicates an average annual error over the five-year period of only 4 percent. Given the recent and developing nature of the underlying national account figures and the very gross estimating procedures for determining the base multiplier, these results are extremely promising. The model certainly warrants further testing and refinement, not only to improve accuracy, but also, through export sector disaggregation, to determine the relative economic significance of the various export sub-sectors of tourism, manufacturing, external aid, etc., and their separate multiplier impacts on GDP. Such multiplier could assist planners in estimating infrastructure needs associated with export growth and, if employment multipliers can be calculated, even help in assessing the amount of increased export activity necessary to achieve some target rate of unemployment. Perhaps the greatest utility however, is that the model presents to general government policymakers a fairly straightforward, non-technical, and workable understanding of the structure and operation of the economy.

Table 5. Actual and Projected GDP, 1979-1983
(Current $US M). (1)

	1979	1980	1981	1982	1983
Tourism and Merchandise Exports	4.5	5.1	6.9	7.5	8.0
Net Transfers	4.9	5.6	5.0	6.5	10.0
Capital Inflows	2.5	6.0	9.6	7.7	6.4(2)
Total Export Income	11.9	16.7	21.5	21.7	24.4
Projected GDP(3)	15.9	22.3	28.7	28.9	32.5
Actual GDP	16.0	24.2	27.2	30.0	32.4
Percent Difference	0.6	7.9	5.5	0.3	0.3

(1) Source: Economic Memorandum Montserrat (World Bank, April 17, 1985).

(2) Source: Economic Memorandum on Montserrat (Caribbean Development Bank, December 1986).

(3) Estimated using a base multiplier of 1.33 in the formula:

$$Y = E \times B$$

where Y = GDP
E = total export income
B = base multiplier of 1.33

Chapter Two

Montserrat Tourism: A Special Case

Unlike neighboring Antigua and St. Kitts, Montserrat's post World War II success story, as described in the preceding chapter, and the island's graceful evolution into a largely service-oriented, export-propelled economy was achieved without placing excessive demands on the its natural resource patrimony. The so-called Emerald Isle's pastoral environment, unscarred skylines and forested slopes, for the most part, escaped the traditional by-products of failing, uneconomic monocultural practices or a panicky switch to mass tourism. There has been (perhaps more from good fortune than good planning) little serious erosion, deforestation, soil depletion, habitat destruction, and only episodic, localized damage to reefs and beaches In fact, recent decades have seen some transitional recovery of previously cleared land to disused pasture, to scrub, scrub-bush and even some dry secondary forest.

This softer resource-use pattern is partly due to the tiny size (low density) of the society and limited scale of infrastructure and partly due to the non-intensive asset demands connected with the modern export sectors. These include the enclave assembly or value-added nature of a modest export manufacturing sector, and most especially the small-scale structure and incremental gestation of a very distinctive, very profitable, almost genteel, socially benign retirement and villa/apartment style of tourism with an extraordinarily low pollution index.

For these and other reasons we explore later in some detail, the tourism sector of the Montserrat economy deserves, despite its ostensibly modest dimensions, our special attention because its success truly appears to be dependent on the non-destructive use of the environment by an unusual group of loyal, low profile, upscale-market tourists whose recreational behavior, investment, and spending patterns appear influenced by the extremely high value they place upon the assortment of "pleasant" environmental amenities. . A recent visitor survey (Devas, 1983) identified these distinctive amenities, as follows:

- attractive and variegated seascapes and landscapes with emphasis on mountain views and untrammeled skylines

- the tranquil measured pace of island life

- pleasant year-round climate

- warm and friendly host population

- wide variety of accommodation facilities of high standard

- relatively good transport/communication/medical infrastructure

- political stability.

It is instructive to note that quaint, traditional, old world qualities were the attributes or characteristics principally responsible for the post-war economic take-off in the 1960's which turned the economic system around and transformed the society from the depopulated, rural backwater described in detail by Lowenthal and Comitas (1962). Triggered in the early 1960's by an almost continuous series of successful residential lot subdivision schemes focused on the U.S. and Canadian "retirement" and "second (vacation) home" market, Montserrat saw new home construction for residential tourists average 100 units per year (at perhaps US $100,000 per unit). In the succeeding decade of the 1970's an average of 110 new units (at more than US $110,000. each) were added annually (see separately-bound Rabenau appendix for tabular information on housing permits). The cumulative scope of this construction/residential tourism boom was truly massive within the small-scale context of Montserrat. By 1980 over 50 percent of the total current housing stock had been created in just two decades (1980 Census, Vol. 3, p. 55).

The product of all this externally driven building boom investment was a string of well manicured. suburban communities, clustered along an extended stretch of Montserrat's leeward coast north of Plymouth, situated mostly on abandoned, disused generally hilly agricultural land. In a fairly short span of time, the exercise established a rather sophisticated local real estate development/sales and rental industry, a very skilled, efficient and specialized local construction industry, and a variety of property management, gardening, and maintenance companies servicing both absentee owners and affluent, short and longer term residents. And as a by-product with a net benefit for Montserrat, there were recurring markups, fees, commissions, income and employment generated at almost every turn by this unique combination of high value, low key, high-spending, low density, retirement/residential tourism. It was sufficiently profitable to give Montserrat the highest per capita GDP in the Eastern Caribbean (see Table 3, previous chapter). It is noteworthy that perhaps 20 percent of the lots in the so-called tourism enclave subdivisions are now owned by increasingly affluent Montserratians.

As a consequence of a perceived slow down in tourist arrivals and a near static GDP in the mid 1980's, there has been some pressure to experiment with new tourism development strategies by increasing visitor densities and expanding more standard kinds of hotel facilities. This would, of course, alter the delicately balanced visitor profile (Ott, 1985) of mainly affluent North Americans and regularly returning or visiting West Indians, a base more durable and less sensitive to the vagaries of international recession and commodity price inflation that have plagued the larger Caribbean destinations (Worrel, 1986; CTRC, Tourism Statistics, 1986). There is, in fact, an implicit high risk in any major alteration of the heretofore highly successful approach in Montserrat.

To achieve a long term goal of "optimizing" the tourism sector's contribution to the national economy (PSIP, 1985), it would be well to first undertake a much more detailed analysis of visitor impacts and resource use patterns as well as looking into ways to improve present marketing strategies aimed at present market niches. Devising an incentives package to encourage scheduled housing starts on unbuilt lots would be one place to begin and would, if tax policy is the tool selected to do this, generate some new revenue. Additionally or alternatively, a construction bond and completion-on-time insurance package could be devised that would encourage new housing starts if done in company with a slight shift in tax policy regarding undeveloped lots being held for speculative appreciation purposes.

RECENT PERFORMANCE

Although no rigorous studies are available detailing its precise local influence in quantitative terms, the visitor industry is clearly the leading sector in Montserrat and is positioned for an even greater economically productive role in the future (Investor's Guide, 1986), especially in comparison to nearby OECS island areas. Best estimates place the proportionate role for the tourism sector (and the related construction sector including direct and indirect impacts) at approximately 20 to 25 percent of total insular employment.

The significance of the tourism sector is even more obvious from even a cursory examination of the trends displayed in Table 6. Between 1976 and 1985 total number of tourists more than doubled, while visitor expenditures more than tripled. The average length of stay (hotel only) at roughly 8 days remained one of the highest and one of the most stable in the Caribbean during this otherwise volatile period (CTRC, 1986). One should note in passing, however, that the ostensibly remarkable doubling of hotel occupancy rate was due partly to rising visitor volume but, more significantly, was also due to an artificial reduction in the number of the base figure of hotel beds when 25 percent were transferred to villa/apartment status.

THE DOWN-SIDE

This relatively bright picture, however, is clouded by some apparent softness in recent years. Foremost among these indicators is the stagnation in stop-over visitors since 1981 which has, in turn, allegedly engendered investment uncertainty and a fall-off in new accommodation construction. High paying, long-staying overnight visitors account for over 95 percent of total the "tourist" expenditure, but considerably less when resident or retirement tourist spending -- up to now not classified as visitor expenditure -- is factored in. As we shall see below, these expenditures loom large in Montserrat's prosperity.

A second problem are concerns about the volatility of cruise ship passenger traffic, a pattern largely outside of Montserrat's control

Table 6. Selected Tourism Indicators, 1976-1985.

Year	Total Visitors (000s)	Stopover (000s)	Cruise/ other (000s)	Total Expend. (EC$M)	Average Hotel Stay (Nights)	Hotel Occup. Rate(%)
1976	11.2	10.0	1.2	6.4	8.9	25.9
1977	12.7	10.9	1.8	7.6	8.6	27.3
1978	15.3	11.5	3.8	8.0	7.9	27.9
1979	16.9	13.1	3.1	10.0	7.8	35.9
1980	20.5	15.5	5.0	11.6	8.0	43.9
1981	21.4	15.6	5.1	14.6	7.5	48.0
1982	24.9	15.0	9.9	15.7	8.0	35.9
1983	18.8	14.3	4.5	16.2	8.1	34.5
1984	21.7	15.9	5.8	18.0	8.0	59.4
1985	24.6	16.5	8.1	20.0	8.1	55.2

Sources: Govt. of Montserrat, Report on Prices, Trade and Tourism, 1985; and 9th Statistical Digest, 1984.

since fluctuations reflect industry-wide phenomena and the cruise ship operators' new preference for shorter hauls from the Miami home base to Caribbean destinations (Economic Memorandum, Montserrat, February, 1985).

A third problem is the continued high seasonality and unprofitable excess capacity in the off-season, a common characteristic of all emerging tourist destinations. Over 50 percent of all visitors routinely arrive during the high winter months of December through March. [As we document later some of Montserrat's "tourists" continue to spend money even though they are absent.]

These alleged market weaknesses continue to prompt well meaning but, we believe, misguided calls for expanded harbor cruise ship passenger handling capacity, catering to the convention business in the summer slack period, new hotels to expand the marketing base, a marine/hotel/villa complex at Little Bay and last, but not least, a new airport capable of handling small jets like the 727 or the new Air-Bus (Ott, 1985; Halcrow, Little Bay Study, 1982; see also von Rabenau Appendix).

THE UP-SIDE

Despite this alleged sectoral softness and the emergence of various, donor-driven, quick-fix, public investment schemes.(some of which would be extraordinarily costly on a per-capita basis), annual tourist expenditure has risen consistently. The explanation of this remains to be properly quantified and clarified but it is, in a way, like "looking a gift horse in the mouth". The simple and obvious but not-yet-provable explanation lies in the income elasticity under U.S. and Canadian tax policies of those heavily invested, moderately wealthy North Americans who find Montserrat still charming, still affordable, and still the true "Emerald Isle of the Caribbees." They simply have more money to spend and the apparent upswing in undeveloped subdivision lot resales (at always higher prices) confirms this.

Additionally, a preliminary but hardly rigorous analysis of the available Montserrat data suggests generally lower than average import leakages and above average spending multipliers because of the strong forward and backward industry linkages with the domestic economy. Montserrat also has uncharacteristically high levels of local hotel ownership (87%) and local labor employed (93%) in the visitor industry (9th Statistical Digest, 1985, Table 6.5 and 6.6). Lastly, expenditure buoyancy may also be a function of the large number of long-staying friends and relatives returning year after year to Montserrat because of the familial hospitality of the expatriate retirement community.

PROFITS AND STRUCTURE

According to the recent Devas survey (1983), Montserrat's visitor profile is unique in the region, reflecting 50 percent from North

America, 30 percent West Indian and the remaining 15 percent split between the United Kingdom and Latin America. Tourists visit primarily for vacations (87 percent) with only 13 percent for business reasons. Two-thirds of the visitors know or hear about Montserrat from family or friends.. Compared to other Caribbean destinations, Montserrat visitors are relatively older (13 percent retirees), more affluent, and exhibit a greater tendency to make repeat visits. It is equally significant that less than 8 percent are on "package" tours.

To examine the structure of the industry, it is helpful (although difficult) to disaggregate the various tourism subsectors and establish the dimensions (quantitative or estimated) of their relative economic importance according to their respective demand and expenditure patterns. Spending behavior is most sensitive to length of stay and type of accommodation. The following analysis of 1985 data presents a simplified breakdown sufficient to illustrate the policy problems involved. Table 7 points up the overwhelming economic and policy significance of stop-over tourists who contribute over 95 percent of all visitor expenditure.

Table 7. Stop-over and Day-Trippers, 1985.

	No.	Average Stay.	Average Expend./day (US$)	Total Expend. (US$M)
Stop-overs	16,509	14	$31	$7.2
Day-trippers	8,117	1	$25	$0.2
Total	24,626	-	-	$7.4

Source: Arrivals from Statistics Office; stay and expenditure estimates authors' adjusted and rounded figures based on Devas,(1983).

Crudely interpreted, this table suggests that one overnight visitor is roughly equivalent, in economic terms, to 37 excursionists who arrive by cruise ship or air for a short, less-than-one day visit. Besides the relative insignificance of cruise ship passengers and other day-trippers, these data also highlight indirectly the probable role of quality accommodations and environmental amenities since longer-staying visitors tend to be both more affluent, more discriminating and more inclined to explore and appreciate the unique cultural, historical and environmental features which make Montserrat what it is.

Recent information suggests that roughly a quarter of stop-over visitors are accommodated in hotels, one-fifth vacation in apartments and villas, while roughly one-half stay in private residences. Table 8 summarizes the expenditure contribution of these three accommodation subsectors employing their respective length of stay and daily spending estimates. The results show a remarkable balance among the subsectors and that each is equally important.

Table 8. The Structure of Stop-over Spending, 1985.(1).

Accom.Type	% of Tot.(2)	No. of Tot.	Av. Stay.	Expend./ Day. ($US)	Tot. Exp. $USM)
Hotel	.26	4,292	6	$93	$2.4 (33)
Villa/Apt.	.22	3,632	16	$45	$2.6 (36)
Private home	.52	8,585	18	$14	$2.2 (31)
Total Stop-overs	1.00	16,509	14	$31	$7.2 (100)

(1) Sources and estimation procedures (percentages are in parentheses), see Govt. of Montserrat, Report on Prices, Trade and Tourism, 1985.

Though smallest in number, villa/apartment visitors produce marginally more expenditure, $2.6 million or 36 percent of the $7.4 million total, because of their relatively long average stay of 16 days. In contrast, given the short average stay of 6 days, the contribution of hotel visitors is mainly a function of the high per capita daily expenditure for expensive accommodations, restaurant meals, personalized service and recreational facilities. On the other hand, private home tourists allegedly have a low average daily expenditure of only $14. This is probably a grossly under-reported figure due to marginal record keeping and hidden "host" hospitality costs which subsidize the visit and reduce daily "visitor/guest" expenses.

Again in crude economic impact terms, two private home visitors are equivalent either to one hotel guest or one villa/apartment vacationer. When business visitors are excluded from all accommodation categories, however, the spending of private-home tourists surpasses the contribution of hotel guests and approaches the level and importance of villa vacationers because the average stay increases to

one month (8 for hotel and 20 for villa/apartment guests (Report on Prices, 1986).

Since no one sub-sector dominates the system, the tourism base is less susceptible to international shocks and market shifts. This is in part due to the solid core of resident and quasi-resident retirees, a small but atypically more affluent North American clientele, the regular annual streams of emigrant Montserratians and other West Indians returning regularly for family visits, and at the bottom an almost constant supply of high-spending hotel visitors on business. The stability that results from this mix contrasts markedly with the typical experience of other Caribbean destinations over-specialized in the lower income, mass/packaged tourism markets where slight income and exchange rate fluctuations abroad produce immediate fall-offs in advance bookings, and arrivals.

By way of contrast, there appears to be a self-insulating dynamic aspect to the Montserrat balanced tourism base in that a recession induced shortfall in either European or North American "new visitors" may be compensated for in the short run by (a) an increase in the number and length of stay of return migrants and/or (b) an increase in villa/residence off-island owner visits when the normal rental market softens. It is suspected that there are other more subtle built-in compensatory or equilibrating elements in the Montserrat tourism sector that should be identified before too much serious consideration is given toward introducing wholly new features or approaches.

If the system had been "created" by design it would be different because one would know the intricacies of the structure. But since this is not the case, the operating policy should be one of system maintenance not modification. The diversified base, with its yet to be quantified hidden multipliers, constitutes a valuable asset, a windfall resource, that should be more carefully monitored and better understood before it is tinkered with.

No other island in the region has been so fortunate as to build a tourism base that is so stable, so economically productive, and which has such a benign effect on the landscape and such a low impact on the natural resource systems. The packaged tourist likes homogenized packaged places which, given its diversity, Montserrat is not and presumably does not want to become. The long stay-over Montserrat tourist, on the other hand, tends to find value in the substance of Montserrat, its cultural, historical and natural features, and its mix of amenities.

These amenities, which include reasonably well functioning biological systems that produce various free services and goods, represent a kind of resource "bank account". Tourist-generated revenues are the interest on that "bank account". In a subsequent phase of these investigations, we expect to address the emerging problem of excess withdrawals of principal from that natural resource bank account. Like any bank account it could be inadvertently overdrawn if one does not pay attention to the balance.

DISTRIBUTION OF EXPENDITURES

A third factor which supports both the special character and strength of tourism in Montserrat is the distinctive pattern of visitor expenditure for accommodations, meals, local transport, shopping, and entertainment. Table 9 presents a breakdown for all overnight visitors and for each visitor type by accommodation. The results highlight first the importance of hotel and restaurant spending, namely, 62 percent of stop-over business. However, this figure is sharply lower than other islands in the region. For example, the U.S. Virgin Islands is 68%, Antigua is 72% and St. Lucia is 78% (Seward and Spinrad, 1982). Since this type of spending has been found to be generally more import-intensive, Montserrat's smaller share of hotel and restaurant spending -- and conversely a higher proportion of spending on local transport, handicrafts, high value added entertainment, etc. -- suggests that tourist income is probably filtering more deeply into and through the economy, contributing to a higher level of GDP and local employment. If this observation is accurate, Montserrat simply has a higher local multiplier per injected tourist dollar.

The data displayed in Table 9 also clearly reveal the contrasting expenditure profiles of the three major visitor types. These include, for example, the overwhelming importance of import-intensive accommodation expenses as expected for hotel guests and the relatively high ratios of local spending for gifts, taxis, entertainment and restaurant meals on the part of villa/apartment and private home tourists. The higher dollar multiplier implicit in these latter patterns suggest an even greater economic importance for these two non-hotel groups than reported in the earlier analysis based only on gross expenditure.

RETIREMENT TOURISM

At the base of Montserrat's visitor profile are the semi-invisible and unmeasured resident, mostly ex-patriate, retirees who originally fueled the modernization take-off in the 1960's with a rolling surge of new investment capital for the purchase of newly subdivided house lots and the construction of a fine second home on a tropical island. Although the resulting retirement community has given the island of Montserrat a distinctive character, as compared to all its neighbors, there has, as yet, been no serious or systematic study of the economic significance of these "residents" in the overall visitor picture. Estimates vary widely regarding their number and significance, and they were excluded from the 1983 survey.

According to local immigration officials there are 287 retired ex-patriate residents living on-island more or less year round (greater than 6 months per year). It can reasonably be assumed that they spend less per day than the average stay-over tourist ($31/day) for basic consumption of food, transport, etc. but considerably more for housing, maintenance, and support services. We estimate retirees spend at least $20 per day ($600/ month) for basic consumables. In

addition, various interviews suggest retirees spend another $20 per day minimum for maid, gardening and house/pool maintenance services. This latter figure is very conservative since it totals only $7,300 per annum per person or less than 3.5 percent of the value of an average $200,000 property.

Given gross daily consumption and housing expenditures of $40, and assuming the typical retiree spends an average of 9 months or 270 days on-island, the expenditure contribution is in the neighborhood of $3.1 million. In comparison with the measured tourism contributions of $7.4 million captured in the visitor survey (which we noted excluded non-national residents so we are not double counting), the retirement community economic input is larger than any single other recorded subsector. If one adds the $3.1 million retirement community expenditures to the total stop-over and excursionist figures, the retirees gross spending contribution accounts for 30 percent of the total of all activity. The full economic and value added contribution of expatriates may even loom larger in significance because of their assumed higher levels of local spending and lower import propensities. Montserrat urgently needs to develop the multiplier for this group and the kindred group of retirees who stay more than one but less than six months. Since some individuals in both groups lease out their residence, and others lend it to relatives, friends and business associates (who may in fact spend more money because the house is ostensibly free), we argue that defining the dimensions of this activity would also be instructive.

Again, in crude figures, this means that in gross economic impact terms, one expatriate retiree is equivalent to roughly 25 stop-over visitors and no marketing costs are incurred.

Table 9. Distribution of Montserrat Visitor Expenditure By Type of Accommodation, 1983 (percentages).

	All Visitor	Hotel	Villa/Apt.	Private Home.
Hotel Rm/Meals	47	73	41	9
Outside Restaurants	15	10	20	21
Transport	10	7	11	13
Water Sports	3	2	4	3
Entertainment	4	2	3	15
Shopping	11	5	10	27
Other	10(1)	1	11	13
TOTAL	100	100	100	100

Source: Devas, 1983.

(1) Authors' estimates.

Chapter Three

The Resource Base, Management and Policy Issues

The landscape of Montserrat along with its cultural resources (its people, values, skills, traditions and sense of place) are its two greatest assets. These help shape Montserrat's special style of tourism. It is unfortunate that this special relationship is neither well understood nor much appreciated. It is rarely mentioned in government planning documents and has never been the subject of any rigorous analysis. Furthermore, there are proposal to take Montserrat's tourism in different directions, competing for a larger share of the mass tourism market.

But it is not that simple. Changing the nature of the special tourism mix in Montserrat's case will probably, as in the parable, kill the goose that lays the golden egg. Worst yet, it will be an irreversible act, and a Faustian bargain leading to an expansion of seasonal, high volume, low profit pre-packaged tourism and a reduction, perhaps even the disappearance, of the current, low volume, highly profitable longer term residential tourism. Caution would seem to be the order of the day, if only to preserve the intricate combination of inputs to the highly specialized retirement tourism product which has proven so economically potent yet environmentally benign.

In the decades since World War II, Montserrat has successfully turned away from traditional, resource-intensive, monocrop agriculture toward smaller-scale domestic activities, marketing "softer products" in a pattern of "amenity consumption," relying mostly on renewable resources. Almost by happenstance, this shift presented a very favorable climate for the emergence of the specialized low impact, high return kind of tourism profiled in Chapter Two but which may in the future require fine tuning to maintain its profitability and suitability as the low key but profitable lead sector in Montserrat's development strategy. Even now some voices argue for a "flashier" kind of tourism, including gamblers and other shorter term visitors with very different life styles, values, behavioral and spending patterns. The hint of change is in the wind, and one important question that keeps resurfacing is how much "new" tourism can the "old" kind of tourism stand? The problem is that we do not really know.

The point to be made here is that any casual, amateurish or uninformed attempt to tinker with the system or experiment with changing the balance or mix ratio among different kinds of tourism can and probably will have long-term economic and environmental risks and negative effects which should be weighed carefully.

* The first risk is that well meaning but inappropriate attempts to supplement Montserrat's unique, highly productive style of tourism with a mass marketed, more glitzy, packaged product will undoubtedly upset the existing process, reducing quality, tarnishing the image and lessening

the high local expenditure multiplier to the much, much lower regional norm.

* The second risk derives from the fragile nature of scenic and other natural assets (and the balanced way they are assembled) and from their intimate, delicate, almost intellectual -- even spiritual -- connection with the quality and visual impact of the repeat-visitor experience.

* The third risk stems from Montserrat's need to sustain its special, somewhat precariously held niche in the highly competitive international tourist arena in the Eastern Caribbean, particularly since Montserrat does not appear to have a wide range of alternatives.

Therefore, the focus of this assessment is on the range of relationships and dependencies, costs and benefits, inputs and outputs that surround and inform government, donor, resident and visitor patterns and practices of landscape and resource system usages. We are specifically interested in the "stock" or "account" of natural and man-made assets that form the basis of the current, highly successful tourism sector, namely: the landscape in its totality -- its scenic beauty, tranquility, skylines, traditional order, borders and boundaries, water, woods and wildlife, shoreline quality, forested vistas, and the historical urban and pastoral landscape.

In the course of our analysis, environmental stresses are noted, possible causative forces are examined and government remedies are offered for further consideration. More detailed discussion of these issues and further documentation and justification are contained in the Rabenau Appendix to this report.

This section concludes with a brief discussion of the likely projected impacts of modest versus rapid economic growth scenarios on the character of the tourism industry and the quality of the environment. In general, the recommendations call for considerably more intense, comprehensive, and coordinated economic and environmental (land-use and coastal zone) planning than has been practiced in the past.

LAND

According to 1985 data from the Land Development Authority, Montserrat contains some 25,500 acres of land roughly divided into 18,000 acres in forest cover (71%), about 3,700 acres in agricultural use (15%), with 3,500 acres devoted to urban uses and infrastructure like roads (14%). This distribution pattern stands in marked contrast to the colonial past, when all except the steeper and least accessible land was pressed into monocrop production and settlement uses.

Much of Montserrat's land today remains idle (or <u>appears</u> to be idle). For example, there is very little active production management of the public forest lands and minimal commercial exploitation on pri-

vate estates. Less than 60 percent of land suitable for agriculture is used for that purpose. Similarly, over three-fourths of the land converted to residential subdivisions since the 1960's still remains vacant. Needless to say, the resultant green landscape, some cleared houselots and unbuilt segments of subdivisions, some fallow agricultural land and many visible examples of forested public and private hillsides and whole watersheds and even unbroken skyline ridges all, when taken together, present a remarkable park-like, well managed, countryside image with a touch of the grand Irish tradition of greensward, coppice, hedgerow, country garden, neighboring woods and forest microcosm. This circumstance and these transplanted features, along with the favorable rainfall are why the sobriquet "Emerald Isle" rings true. It is true! How long it will remain so is the question.

At present, Montserrat has the good fortune to have remained exempt from nearly all of the environmental woes and threats facing the larger neighboring islands in the archipelago. The environmental problem list includes such relatively minor matters as an ecological restoration task with 200 plus acres of eroded, worn-out land in the northeast, some probably ephemeral beach erosion from sand mining along the western coasts, and some loss in natural scenic quality from scattered residential development scars along selected hillsides. There is a problem with the diminishing historical flavor of Plymouth (an incremental, locally unlamented loss of the architectural vernacular in favor of concrete walls and plastic signs). But there is little serious resource competition and virtually no major use conflicts. In fact, the key policy conflict identified by policy makers during our field interviews -- the conversion of agricultural land to residential uses -- actually poses little serious danger at present.

To illustrate, we estimate from data eclectically compiled from a variety of sources that roughly 50 acres of rural land is being converted per year. In contrast to the unpredictable vagrancies of private real estate transactions, this conversion largely represents a controlled process whereby the government -- accumulating land through an active buy-out program from the larger estates -- makes housing lots available to low-income residents. Given the 6,650 acres potentially suitable for agriculture and current uses of approximately half of that, this annual conversion rate of 50 acres could be sustained beyond a twenty-year horizon without damaging existing production levels.

Since, at present, there is not a great land crisis, Montserrat has time to shape an agricultural and vacant/underutilized land development strategy that maximizes compatible uses among tourism, agriculture, and residential sectors. Secondly, there is time to organize a data collection initiative to assist decision makers in assessing land capabilities, market driven land re-allocation by use classes, etc. Specifically, these indices should include at the minimum: rural-to-urban conversions, subdivisions, construction permits and completions, land and beach erosion, acreages cleared, and/or reforested, used for public utilities including roads, etc. Annual totals should be run on all land use data collected or recorded on a recurring or intermittent but systematic basis. Current totals

should always be compared with previous year totals and the summary sheets circulated widely.

FORESTRY

Montserrat's forests cover roughly 70 percent of the total land area. If we subtract gently sloping vegetated areas with modest agricultural potential, the remaining 55 percent of the total constitute the core forested watershed areas, only a small portion of which is crown land or protected by park or reserve status. But these very slopes are vital for limiting soil erosion and for protecting fresh water supplies for agricultural, commercial and residential uses. They also make for clear, unbroken skyline ridges and verdant scenic panaramas consistent with the "Emerald Isle" image that attracts long-staying tourists.

Legislation already in place protects areas above 1400-1500 feet from intensive and indiscriminate cutting, land clearing, burning and livestock grazing. However, enforcement of these regulations is seldom vigorous, often absent and degradation continues at selected sites. Fortunately, active forestry uses, both legal and illegal, are limited to small-scale charcoal, fuel wood, log-wood, and fence-post production. For example, an unknown number of individuals or households illegally live in the rain forest and practice slash and burn agriculture. A small amount of logging is regularly undertaken for cabinetry and carpentry purposes without permits. Wood is collected sporadically for charcoal production, and kilns are fired up in forested areas without permission or prosecution. Wild goat grazing continues to cause hillside erosion and to hamper reforestation efforts.

Our analysis suggests that existing harvesting is well within sustainable levels of activity and is not heavily concentrated in or confined to areas prone to erosion. Reforestation efforts to date are restricted to a 40 acre erosion control project begun in 1980 and a 15 acre experimental watershed management venture started in 1985). It would be generous to say the results are modest.

The success of the 1988 CIDA project based on smallholder plantings will most likely depend upon whether past problems like losses from roving herds of untethered livestock can be corrected. These animals, which are "parked" en masse along various roadsides by their owners, inevitably go astray, wandering into unfenced fields, domestic vegetable gardens, private yards, and landscaped areas planted with expensive ornamentals. Such cattle are generally owned by landless farmers whose irresponsible (albeit traditional) activities in this regard appear to have the tacit approval of Government. There has been little effort to protect residential landowners against excessive damage by regulating such grazing practices. The best solution -- providing leasable, low cost, fenced grazing land at various convenient locations (with the grazing or pasture rental fee payable in cattle which could be distributed to low income landowners) -- has not been tried at all. This tactic would not be limited by the

customary NIMBY factor because most aggrieved landowners would welcome the opportunity to get the animals out of their front yards!

Most small environmental problems like these fester and become worse over time because of the complexity of natural and human system interconnections. In fact, they can become much worse if not dealt with since sometimes the aggregate effects of many little, but persistent environmental insults, when temporally and spatially juxtaposed and compressed, not only become cumulative but switch from additive to geometric growth rates. This event is what is often referred to as a threshold point. Unfortunately, determining the locus of any such thresholds in the changing man-environment relationship is well beyond the scope of this research effort and this paper. We can only undertake the first few steps towards identifying early warning signals of environmental overload or excessive natural asset withdrawal.

To accelerate this process. several initiatives are necessary. These include, first, an improved, simple environmental monitoring routine and record-keeping system particularly in terms of the spatial and temporal patterns of natural resource use, damage, withdrawal and depletion rates and quantitative measurements and estimates of natural regeneration. This basic information is crucial for making judgements about the sustainability of each resource use practice.

Secondly, we believe that decision makers and the various department administrators responsible for forestry management must discuss and resolve whether the causes of weak enforcement relate to perceived negligible benefits or to a failure to appreciate the natural attributes and functional values of the forestry sector -- e.g., in the various aspects of water supply and other amenity services to the tourism sector, for villages and the municipal area of Plymouth, in erosion control and watershed management for agricultural productivity.

AGRICULTURE

Although agriculture continues to attract major policy attention, clearly the sector has lost much of its earlier significance. Presently it is estimated that only 16 percent (1,060 acres) of suitable acreage is under cultivation compared to the 6,500 planted at the turn of the century. As with other classic labor-exporting islands in the East Caribbean (Philpott, 1973), persistent emigration has encroached upon the resource base while internal labor market competition has drawn workers increasingly into tourism, construction, manufacturing, and government employment. Indices of waning farm effort include reduction of the number of farms and farmers, acreage in use, and cultivated acreage, as well as predictable increases in idle farmland and the average age of farmers.

On the other hand, there is evidence of increasing use of capital inputs -- fertilizer, tractors, irrigation -- to substitute for reduced labor availability. Moreover, despite some data lags and

inconsistencies, the past decade has witnessed relative sustained overall production levels with some declines in fruit, vegetable, and food crop output matched by clear rises in poultry, eggs, beef, mutton, pork, and fish production (Ninth Statistical Digest, 1984). This limited success is partially due to the Government's active, step-by-step program of targeting a few crops with high success potential for special incentives and policy focus. Present targets include locally popular vegetables -- cabbages, lettuce, tomatoes and carrots
-- as well as white potatoes and onions for export to CARICOM neighbors. Incentive include: irrigation access, subsidized seedlings, seasonal import restraints, and research support from CARDI-CARDATS.

Chronic problems persist, however, and cloud the long-term horizon. The cost of local production remains high, despite natural transport barriers against import competition, because of: (1) high land preparation costs for small-scale producers; (2) the high cost of imported inputs because of break-bulk handling charges; (3) labor scarcity and wage levels above the Windward Island norm; and (4) the common practice among small producers to negotiate high-price/small-volume contracts with middle men.

Other practices and institutional factors tend to reduce incentives and raise per acre costs. These include: (1) the large number of renter-operators, some two-thirds of total farmers, which may inhibit investment in long-term land improvements to raise productivity; (2) crop and soil fertility losses caused by loose livestock which we estimate to approach EC$300 per acre of prime land (the cost of fencing); (3) the common practice of commuting from urban homesites to distant farm plots which reduces productive time and effort and limits efforts to guard against foraging animals and praedial larceny; and (4) lack of enforcement of legislated codes (1958 Agriculture Ordinance) for good farm management and husbandry cover for erosion control and the terracing of sloping land under cultivation.

Another critical need in Montserrat is a serious assessment of the resource requirements of agriculture. This should include a selective, comprehensive survey of the full-time farmers/fishermen and major activities for annual updating. An up-to-date land capability study is also necessary for clearly distinguishing prime growing tracts from secondary acreage for pastureland. This task will further require some sense of where the sector fits into the long-range industrial mix of the future economy.. In this way, the process of regularizing agriculture (and forestry) would enable the serious integrated planner to define how both sectors can benefit tourism -- not only as local food/fish, water/fuel supplier, but also as preserver of scenic green space amenities and rural tranquility, wildlife and general biodiversity.

BEACHES

Beaches perform a variety of valuable natural functions in Montserrat's insular ecosystem. They also represent economically

exploitable resources. In the former case, they are natural buffers for terrestrial and marine systems. They trap rainwater runoff and protect nearshore coral and marine life, and they act as buffers against sea swells and retard coastline erosion. In the latter case, beaches are highly valued asset prized by Caribbean tourists universally attracted by sun, sand, and sea amenities. This use, however, compatible with the natural action of buffering, clearly conflicts with the common practice of sand mining for construction purposes which is directly destructive of the environment. According to Cambers (1981, 1985), beach mining has already been responsible for significant erosion despite a fee and permitting process already on the books to curtail this activity.

To reverse this trend and improve enforcement, we recommend at a minimum that the permitting system be implemented immediately. Based on these records, Government can compile annual figures on the amount of sand made available to the public from each beach and, through routine inspection after major storms, monitor erosion. A protocol for beach profiling could be provided by either CCA or IRF or even the UNESCO consultant, Dr. G. Cambers.

We also recommend that the Government begin planning for alternative sources of aggregate to avoid potential future despoliation of these tourist assets. These include bulk purchases of imported sand for resale as well as marketing and processing arrangements with O'Gara. The latter would involve large Government purchases of O'Gara's coarser aggregate, preferably at a sizable discount from the current retail price, for both resale or for further refining with a new crusher to be competitive with fine beach sand. This will, of course, further require either a prohibition on beach sand mining, or the establishing of a retail price that exceed's O'Gara's discounted price plus the mark-up for Government refining costs. Any effective policy options will demand considerably more Government commitment to enforcement and considerably more public acceptance and compliance than has been traditional in the past.

WATER

The "Emerald Isle" is blessed with a relative abundance of water resources partly because of its low population density and growth, the modest level of development, and the non resource-intensive industrial mix of small-scale agriculture, light industry, and tourism. Nearly 70 percent of consumption is for domestic household use. Residential and commercial demands are served by natural springs, which supply over 85 percent of the total, and wells. Because of low-density urban development and dispersed water sources, over 100 miles of main lines are needed. This causes some leakage as the pipe systems ages and requires heavy replacement costs. The Water Authority is responsible for water management and conservation (Lausche, 1987).

At the present time, there are negligible signs of scarcity. The only fragmentary evidence we uncovered was occasional seasonal instances of saltwater intrusion in selected irrigation wells (at Forms

and Belham areas) caused primarily by over-pumping in the dry season (see Barragne-Bigot, September, 1986). There is, however, some concern about the future if the expected increases in income, population, home-building, and the projected growth in tourism and agricultural irrigation materialize over the next decade. Although only about 64 percent of the available springwater is presently tapped, most of the unused capacity is either not economically exploitable or poor in quality (Corker, 1986). Our concern for the future is heightened by the reality that there has been little reinforcement to date of watershed protection codes prohibiting cultivation, tree-cutting, etc. in watercourse areas.

While cursory evidence suggests water's low priority may be justified at the present juncture, evidence from surrounding islands indicates that scarcities will certainly surface as the momentum of modernization proceeds in the future. To ensure sustainable supplies to satisfy the Government's goals for agriculture use, residential housing expansion, and tourism, several on-going efforts should be continued and intensified. We recommend establishing a coordinated water plan consistent with Montserrat's overall strategy to achieve an urbanization pattern that accommodates agriculture and tourism development.

HISTORICAL PRESERVATION

As an emerging, low-density tourist destination, Montserrat enjoys several qualities that distinguish its product from its competitors. These are its scenic land and seascapes, rich cross-valley panoramas, its upland forest cover and skylines, its leisurely pace, smallness or neighborhood familiarity, and old world charm. Retaining and capitalizing on these assets is strategic for tourism's future sustainability since these amenities are highly prized by the relatively affluent, educated, long-staying visitors and retirees who presently constitute the base of Montserrat's stable market. A concerted public and private effort at historical preservation of colonial artifacts, architecture, and archives would assist in ensuring that the islands's attractive historical treasures are preserved for future generations of visitors and residents alike.

In addition to efforts already underway, we suggest a serious focus on preserving the historical district of Central Plymouth. The broad aims would be: (1) to retain what remains for local educational and touristic consumption and (2) to preclude any further loss of amenities through the destruction of valuable old buildings and construction of generally less attractive, alien facilities (commercial or governmental) with designs out of scale and lacking a visual rhythm with their historical surroundings.

Some initial steps to be considered include: (1) legislatively creating an historical district of Central Plymouth; (2) developing an inventory and registry of existing buildings with pertinent historical descriptions of former and contemporary uses; and (3) establishing a public (inter-agency task force) and private (shop owners, landlords)

Plymouth Preservation Board to codify construction/modification procedures, judge design guidelines, suggest incentives, etc.

GROWTH SCENARIOS

The preservation of Montserrat's attractive environmental patrimony and sustainability of its economy will depend not only on the style, character, and compatibility of development in each sector, but also on the pace of development activity. That pace will be most notably reflected in population growth and the rate of urbanization. High rates of growth obviously will hasten resource competition, intensify user conflict, and speed-up environmental degradation. Slow or modest growth will not retard these affects but provide sufficient time frame for (1) some biological renewal and (2) monitoring emerging stresses and coherently formulating mitigation strategies compatible with sustainable solutions.

Present growth, affluence, and policy awareness in Montserrat suggest the future will clearly contrast with the past century of population stagnation. That depressed period was largely characterized by low rates of natural population increase (birth rates less death rates) matched by high rates of emigration, a depleted labor force and skill pool, an eroding investment climate, and environmental neglect. Rather, today, partly because of return migration, the island population is expanding between a half and one percent annually. This growth is based on a rising rate of natural increase -- the crude birth rate is 2.2 percent and the crude death rate 1.0 percent (1983) -- combined with a declining rate of net emigration of roughly 0.5 percent per year. Because of these annual population additions plus the increase in the labor force participation rate noted in Chapter One, Montserrat's labor force has risen more than three times as rapidly as population growth since 1980. Yet the unemployment rate has remained a steady 5-6 percent, one of the lowest in the entire Eastern Caribbean.

We believe this growth is broadly compatible for the foreseeable future with the Government's long-term economic strategy, as expressed in the PSIP, to foster tourism and other international services, light manufacturing, and domestic and export agriculture. Although ensuring the implementation of these goals will require much more specific analysis and planning of sectoral employment targets and investment needs, the expansion in labor force skills and the working age population currently taking place seems consistent with sustaining the present overall structure of the economy in the context of continued modest infrastructure improvement and managed urbanization.

On the other hand, the present diversified economic base and the projected one percent population growth is clearly not compatible with the rapid gestation of the large-scale resort complexes -- Little Bay and, to a lesser degree, at Bransby Point -- already on the drawing boards plus the less likely but often talked about construction of the long-planned, new international airport. The concentration in time and space of such major projects would quickly deplete the local labor

pool and would require a rate of return migration-cum-immigration equivalent to the rate of natural increase. With the population growing in excess of four percent per year, to supply construction workers and to service new hotel/restaurant/shop capacity would, in a short time, result in fundamental stresses and imbalances.

The most important would be: (1) wage inflation that would damage agricultural effort and further erode the island's competitiveness in light export manufacturing; (2) real estate inflation that may hamper the Government's low income residential housing program, spawn unproductive speculation, and produce haphazard urban sprawl; and (3) as has occurred elsewhere in the region, noticeable environmental alterations and amenity losses caused by quick-fix accommodations to surges in activity.

Most importantly, however, the changes in scale demanded particularly by the new airport would fundamentally alter Montserrat's tourism. The high visitor densities required to financially support the airport would trigger a shift to highly competitive mass marketing away from the stable, low-density retirement style that has thus far successfully distinguished the island from surrounding destinations. As evidence abounds from the U.S. Virgin Islands, St. Marten, Antigua, and elsewhere, the transition to this type of low-input/high volume merchandising is fraught with long-run environmental dangers, loss of local economic control through foreign ownership, and over-specialization and other spillovers which destroy the measured pace and familiar quality of island life. These are the very amenities which guarantee the compatibility of Montserrat's low-density tourism with the resident population, and hence represent the bases for tourism's social stability and environmental sustainability through time. Any serious discussion of the airport should confront these long-range issues.

Chapter Four

Summary, Policy Implications, and Future Research

This study achieved a variety of goals. These include developing some provisional background for establishing a preliminary understanding of the resource management process in Montserrat, providing a macro analysis of the economy as well as an examination of tourism as the lead sector, assessing current resource uses, identifying some emerging ecological stress points and underlying causes, and briefly evaluating the impact of high and low economic/demographic growth scenarios on environmental stability and economic sustainability. The provisional background goals include (1) identifying a local cadre with resource-planning expertise, interest, and decision-making responsibility; (2) providing some focus for their ongoing awareness and efforts; and (3) developing a preliminary data base and bibliography to initiate the planning process.

The macroeconomic analysis reviews the post-war restructuring of the economy from monocrop to tourism and export manufacturing, measures the extent that external resources support the contemporary economy, and focuses on the significance of the visitor industry in general and residential or retirement tourism in particular. While this substitution of "soft" amenity consumption and small-scale activities for colonial sugar culture and sea-island cotton has reduced serious resource depletion and achieved for Montserrat a level of affluence ahead of its OECS neighbors, it has resulted in the trade-off of traditional specialization for increasing dependence on tourism spending, foreign investment, and income remitted from Monserratians working abroad. According to the multiplier analysis, on the average a dollar injection from any of these off-island sources creates $1.33 in island GDP.

The sectoral analysis of tourism highlights the distinctive market mix characteristic of Montserrat, i.e., primarily affluent, long-staying Americans and returning West Indian migrants. Results suggest that stop-over visitors contribute over 90 percent of the total visitor expenditure. In terms of equivalence, one stop-over visitor is worth the aggregated tourist spending of 37 cruise passengers and/or excursionists. On the other hand, a summary study of the impact of residential tourism -- thus far omitted in official statistics -- reveals that retirees, who number less than 300, contribute a remarkable 30 percent of all tourist revenue. In terms of rough economic equivalence, this means that one residential tourist is worth 25 stop-over visitors or over 900 day-trippers.

Regarding current resource use, the modern diversified economy of Montserrat is distinguished by reduce agricultural effort, idle forestry land, high vacancy rates and low densities in urban areas, and primarily small-scale resource exploitation. Less than 20 percent of suitable farmland is being cropped, and forest harvesting is confined to sporadic and marginal charcoal production, log wood cutting, and so on. Although traditional rates of resource depletion have been no-

ticeably reduced, signs of continued environmental stress include overgrazing and soil erosion, particularly in the northeast, beach degradation along the western coastline from sand-mining for construction purposes, and the deterioration of scenic/touristic assets from residential developments along hillsides. Thus far, water availability exceeds current requirements.

Much current resource depletion could be reversed by strengthened enforcement of existing codes and an improved incentive structure that supports environmental renewal and sustainable uses. There are in place numerous far-sighted instruments of environmental management including ordinances protecting forests, agricultural lands, and watersheds. This legislation prevents indiscriminate tree-cutting, land clearing, and livestock grazing along hillsides, prohibits farming in water course areas, and proposes erosion controls and terracing for sloping farm land. Enforcement, however, is weak; deficiencies exist in evaluation, monitoring, and record-keeping; and degradation continues at selected sites. The few small-scale reforestation projects attempted have been hindered by losses from loose livestock grazing.

In the long term, the analysis of possible future growth scenarios suggests that, with the exception of beach sand-mining and some concentrated over-grazing, current uses are clearly sustainable. In a climate of stronger government enforcement and improving citizen environmental awareness and compliance, existing levels of resource use can also support rising standards of living. The low-growth path assumes an average rate of population growth of roughly one percent (slightly higher for the labor force) as well as continuation of the present economic structure emphasizing primarily long-staying, low-density, "European style" tourism, small-scale agriculture and export manufacturing, and managed residential expansion and urbanization.

The rapid growth scenario, on the other hand, presumes the simultaneous expansion of two major resorts and the new airport (or its equivalent) serviced by a projected population growth likely to exceed four percent per year. This would sharply alter the present diversified economic balance and endanger environmental stability. These massive changes would foster resource competition, increased specialization and market fragmentation, and tourism volatility at the expense of smallholder agriculture and fisheries, labor-intensive manufacturing, and the Government's low-income housing program. The high visitor densities needed to justify the airport and the larger hotels would certainly require a mass-marketing "American style" tourist strategy that would erode the pristine amenities and old-world charm of the "Emerald Isle." Rapid high volume growth would also fundamentally conflict with the more traditionally serene, less frenetic retirement visitor base that distinguishes Montserrat from other Caribbean competitors. Evidence from around the region and Montserrat's own residential building boom in the 1960's caution against the instability associated with the high-growth scenario.

We believe two indispensable tools are necessary to achieve a sustainable long-term, modest-growth scenario that is realistic in

terms of Montserrat's past emigration patterns and amenable to improved living standards for residents. Both involve improving the base of information utilized in the strategic decision-making process. They require the following steps: (1) institutionalizing a centralized long-term planning and information function and (2) fully articulating an over-arching integrative economic plan to guide the process. The former involves land use and natural resource planning, providing data to monitor environmental/economic interactions, and the pinpointing ecological stress thresholds. The latter requires developing useful models to assist policy makers in formulating a cohesive program.

We find in Montserrat many basic elements of both planning and long-range economic strategy, but these pieces are too fragmented across departments and too low in priority to coalesce into a consistent and effective resource management program. This program is needed to implement a successful plan for sustaining a diversified economic base to guide public infrastructure decisions.

As a follow-up to the present study, we propose some immediate tasks for the resource planning function, once it is staffed, to raise the priority and visibility of environmental management. Some of these steps represent work this mission was unable to accomplish within the allotted in-country time. These tasks include:

a. An in-depth, fairly comprehensive survey of government officials to identify leaders' perceptions of Montserrat's major short-run and long-run economic and environmental problems and natural resource inputs to sector and national growth and development. Our impression was that this concept of use, withdrawal, or management of natural resource assets was not a readily available or frequently used conceptual tool or device for understanding the finite nature of some renewable resources within foreshortened life spans.

b. Establishing a modest but carefully targeted management information system of regular data collection and reporting that (1) specifically responds to these local issues, but also that (2) carefully monitors environmental change and depletion rates for basic resources and their uses: land values, rural-to-urban land conversions, soil erosion, beach alterations, forestry losses, water scarcity and the like. In the absence of a full-blown monitoring system concerning all major resources, this task will also involve developing some experimental measures for assessing environmental stress. These proxy indicators may include rates of change in the rural-to-urban conversion ratio, escalating real estate inflation, persistent declines in agriculture productivity and so on.

c. Once environmental effects can be accurately monitored, a third step is the difficult task of valuing

these changes, that is, translating rates of depletion, damage or induced scarcity into economic costs which can be factored into the profitability analyses of various resource-based activities responsible for the degradation.

It is fortunate that we now have a variety of new techniques that are just becoming available for assessing the economic contributions associated with the draw-down of environmental assets (Ahmad and Sammy, 1985; Freeman, 1979; Hufschmidt et al., 1983; Dixon and Hufschmidt, 1986). Caution is urged for any curious scholar who wants to join in the search especially regarding the need to keep any models (1) compatible with the scale of Montserrat and the rudimentary quality of data, (2) responsive to the specific information and decision needs of policy makers, and (3) in line with the risk levels or immediacy of identified long-run environmental stresses the country faces.

In this regard, it may be useful for regional applications to develop an aggregative methodology for integrating the costs of environmental deterioration into a reformulated GDP accounting framework. This macro model could provide estimates (heretofore unmeasured) of the asset (capital stock) depreciation associated with present levels of production and income. When substracted from GDP, these resulting estimates could form the basis for new and more accurate definition of sustainable growth and real quality of life changes. Where depletion types and rates can be fairly easily assigned to specific economic activities, the model could be used for assessing the sustainability of various long-run growth scenarios.

It appears, however, because of the formidable problems of baseline measurement and the difficulty of aggregating different types of depletion rates for different resources, it may be more appropriate in the case of Montserrat to concentrate initially at the micro level. This involves carefully monitoring the cumulating environmental effects of, for example, small-scale farming, logging, grazing, and construction activities, valuing hidden costs of production, and assigning them to updated versions of the economic feasibility studies in the Rabenau Appendix. Such an approach would reveal which resource-based activities are truly profitable, once the environmental costs are accounted for (free goods from the public stock or externalized pollution and environmental damage or depletion costs really constitute a hidden subsidy). By comparing the costs of enforcement and mitigation with the valuation of depletion rates, the model could also be employed to help select where management efforts and enforcement should be concentrated to derive the biggest pay-off (with the lowest subsidy). A pilot project could be chosen to determine whether this approach is feasible in Montserrat.

Finally, the planning function will have to initiate a series of tourism case studies to carefully dissect by disaggregation (through case histories) the extant residential tourism system as it exists. The tourism studies must include a benchmark assessment of the visitor industry in the economy -- employment, income, investment, and foreign

exchange impacts -- to be periodically updated to monitor changes. Another major priority is a more expanded version of the economic impact analysis of retirement or residential tourism begun in Chapter Two of the present study. This significance is clearly needed to inform current discussions about the airport.

Other more sophisticated studies will be necessary for designing a sustainable tourism industry that is compatible with and reinforced by agriculture, forestry management, and urban development. These should include an up-to-date capability survey of agricultural effort and projected needs and a basic water plan that can be annually monitored. The complementary tourism analyses will involve, for example: (1) food and reforestation linkages with tourism as well as (2) the valuation of scenic and recreational assets for measuring resource use conflicts and the spillover effects. The linkage studies would be directed toward preserving the low-density character of Montserrat's tourism style, anchored to the residential component. This would complement ongoing efforts by Government to lengthen visitor stays and raise per capita spending through the provision of improved amenity access (mountain trails, scenic overlooks) and new facilities/attractions, as well a up-scale target marketing. It would also include feasibility analyses for food, beverages, and other likely import replacements. We note in passing that the CTRC sponsored agricultural/tourism linkage study for the Eastern Caribbean (CTRC, 1984) is not terribly helpful in this regard.

A series of so-called amenity valuation studies would be directed toward applying experimental modeling and survey techniques recently appearing in the literature (Cullen, 1985; Loomis, Sorg, and Donnelly, 1986; Loomis and Walsh, 1986) to determine how the benefits of scenic and touristic resources can be estimated, how losses caused by non-tourist activities can be measured, and how these impacts in the long term affect destination attractiveness. Two specific possibilities would be to begin to estimate the monetary contributions or benefit streams on value-added to tourism attractiveness from reforestation efforts and the restoration of downtown central Plymouth. All of these new research efforts should provide the information base for assisting Montserrat in moving closer toward the formulation and implementation of an integrated eco-development policy on sustainable resource uses.

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