



MONTSERRAT

NATIONAL ENVIRONMENTAL ACTION PLAN

May 1994

MONTserrat

NATIONAL ENVIRONMENTAL ACTION PLAN

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THE NEAP PROCESS

The Government of Montserrat has prepared a National Environmental Action Plan (NEAP) in order to assess the key environmental problems facing Montserrat, and devise policies to manage the country's natural and cultural resources better. The NEAP has been produced as part of a regional initiative to improve national environmental planning and regional donor coordination resulting from the June 1992 meeting of the Caribbean Group for Cooperation in Economic Development (CGCED).

The NEAP will be integrated directly into the Public Sector Investment Programme for 1994-96 (PSIP) and National Development Plan. The Government of Montserrat is committed to the implementation of the NEAP. Constraints on technical and financial resources require the Government to seek international assistance.

The NEAP was produced with the assistance of the World Bank and the UNDP, in a consultative effort with representatives of Government and the Montserrat National Trust. The first draft NEAP was based on these consultations and upon Montserrat's Country Environmental Profile, National Forestry Action Plan, UNDP Environmental Programme, and other studies.

The NEAP was reviewed in consultation with officers of the Forestry and Environment Division, the Fisheries Division, the Agricultural extension Division, and the Planning Unit of Ministry of Agriculture, Trade and the Environment, the Environmental Health Division of the Ministry of Education Health and Community Services, the Development Unit of the Ministry of Finance and Economic Development and the Montserrat National Trust. The findings of these consultations have been incorporated into the NEAP. The NEAP was approved by the Government of Montserrat in May 1994.

**GOVERNMENT OF MONTSERRAT
ORGANIZATIONAL STRUCTURE**

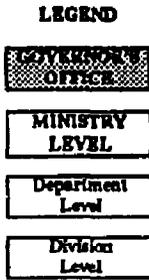
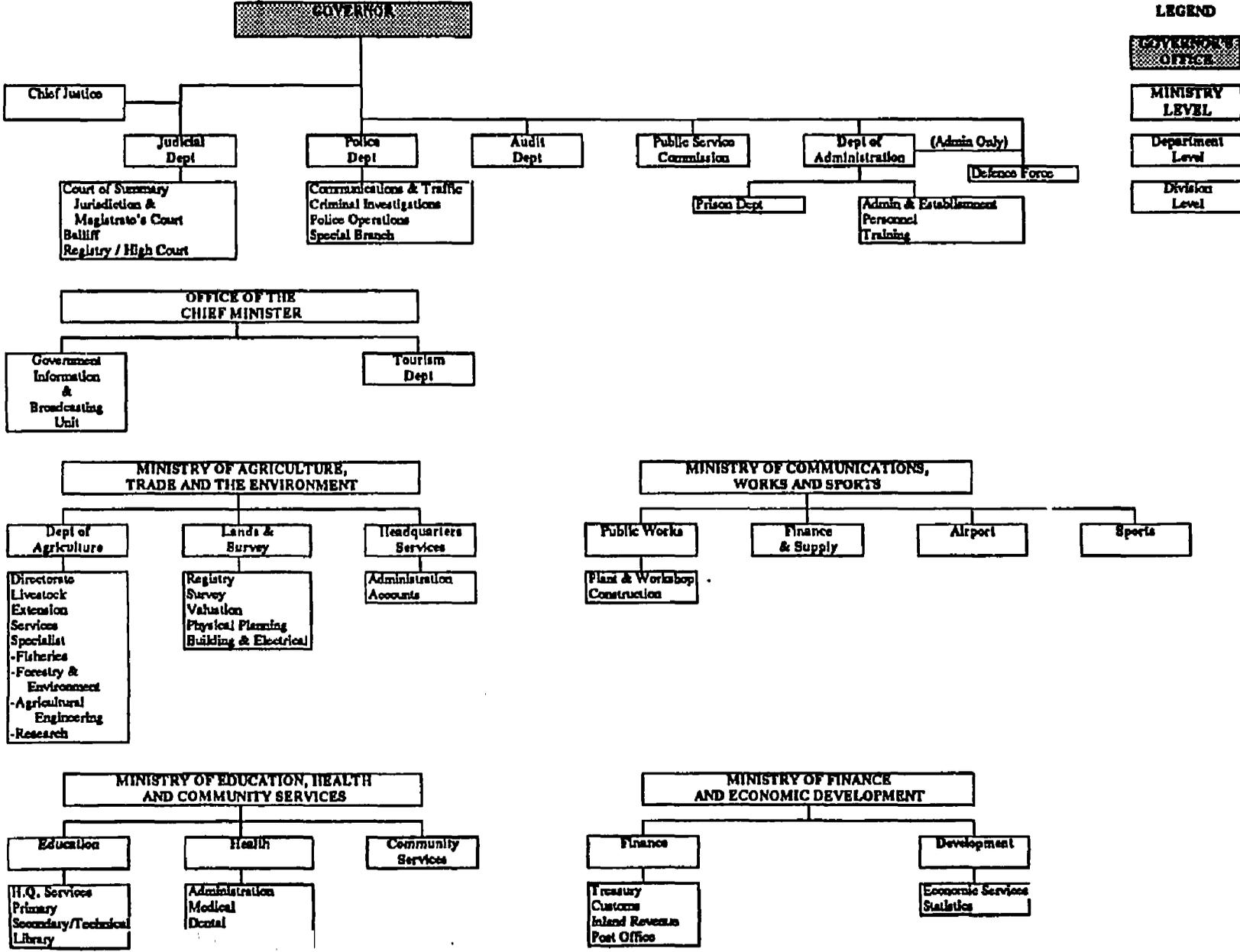


Figure 1

I. INTRODUCTION

1. **The Ministry of Agriculture, Trade and the Environment has undertaken the preparation of a National Environmental Plan (NEAP) for Montserrat, with assistance from the United Nations Development Programme (UNDP) and the World Bank. This is to be one of a series being prepared for the Organization of Eastern Caribbean States (OECS) and other Caribbean countries, and in other developing countries world-wide, and will be presented at the 12th Caribbean Group for Cooperation in Economic Development (CGCED) meeting in June 1994.**
2. **In September 1993 the Montserrat Environmental Profile (MEP) providing an overview of the country's main environmental problems and recommended actions, was completed and made available to the Government and the public. A World Bank mission visited on 1-5 November 1993 to assist in the process of drawing together the recommendations in this report into a form that would relate them to the economic and social challenges for Montserrat at this stage of its development; establish, in this context, the more urgent priorities for environmental action, taking into account the implementation constraints; make recommendations for specific policy measures; and suggest project proposals that could attract external support for environmental initiatives.**

A. Overview of the State of the Environment

3. **Montserrat (See Map at end of document) is a small mountainous volcanic island of 102 square kilometers (sq. km) whose traditional lush green beauty has earned it the title of "Emerald Isle" of the Caribbean. With a low stable population of under 11,000 people, and consequently relatively low human pressure on the land, Montserrat represents one of those unstressed peaceful idyllic island environments sought out by retirees from the north. Whilst the conditions of Montserrat's environment is generally good, there are incipient problems of potential seriousness.**
4. **The Montserrat environment, like that of other small island developing states, is vulnerable in peculiar ways and is today showing signs of stress as a result of these vulnerabilities. Because of the concentration of resources in a small space, intensive forms of resource utilization have been the norm. Fragile island environments experience great difficulty in recovering from intensive perturbations. Thus, early agricultural practices so dramatically altered the disposition of forests on the island and depleted the soil that in a number of areas agriculture had to be abandoned. The original pristine tropical rain forest has not come back and stress is manifested in the natural environment taking on the appearance of scrubby secondary forest.**
5. **This impairment of Montserrat's lushness has been exacerbated by the island's vulnerability to natural disasters. Although Montserrat was dealt a serious blow by Hurricane Hugo in 1989, the immediate destructive effects of the hurricane formed an integral element of a dynamic Caribbean ecosystem that allows the emergence of early successional forests which are more productive and in many cases more beneficial than mature forests. However, the natural regeneration of the vegetation is now being threatened and reversed by the very significant problem of over grazing by loose**

livestock, particularly goats. The consequences of this for soil and water conservation and water purity have not escaped the Government's attention.

6. Small islands are also prone to depletion of their non-renewable resources. Such has been the case until recently with the mining of beach sand for construction purposes which has left once beautiful black sand beaches devastated.
7. The environmental stresses outlined above take on special significance when one considers Government's shift in policy away from an agriculture-based economy to a tourist-based economy. Government has already demonstrated a commitment to sound environmental decision-making by placing a ban on beach sand mining and by moving to enforce the impoundment laws on loose livestock. A national effort is now required in terms of integrated resource management and waste management.
8. Montserrat is blessed with a very active well-organized National Trust which ably supports Government in its efforts at environmental management. They have been co-operating in the conservation of the natural and historical heritage and there is no doubt that this partnership, which produced the MEP will ensure that Montserrat's environmental integrity is maintained and that the island will develop sustainably.

B. The Economy

9. The smallest of the economies in this series of OECS reports, Montserrat suffered heavily from Hurricane Hugo in 1989 and only recently completed its recovery. The latest report on the economic situation, prepared by the Eastern Caribbean Central Bank (ECCB), EAS and Caribbean Development Bank (CDB), indicates a Gross Domestic Product (GDP) in 1991 of about US\$45 million and a per capita income of US\$6,000 for a population of under 11,000. Although Montserrat's per capita GDP is high by East Caribbean standards, this has been offset by difficulties associated with the limited size of the national economy and the consequent inability of Government to generate revenue sufficient to undertake capital development projects. Montserrat is one of the British Dependent Territories of the Caribbean, a colony since 1632 but now largely self-governing. It is a full member of the Caribbean Community (CARICOM) and the OECS.
10. Despite its small size of 102 sq. km and rugged terrain, Montserrat has become in recent times a relatively prosperous island, successfully managing its transformation from an agricultural base to a mainly service and export oriented economy in which tourism, light manufacturing and construction have become the main areas of development. This has not so far placed excessive demands on natural resources, or damaged Montserrat's image as the "Emerald Isle" that is still "the way the Caribbean used to be".
11. In 1980-88, the economy grew at an average of close to 4% a year in real terms, consolidating this growth primarily in the tourism sector, which was responsible for much of the construction activity and by 1988 accounted for 20-25% of employment. Agriculture accounted for under 5% of GDP in this period but about 10% of employment. The small manufacturing sector (about 6% of GDP) included sizeable

export operations -- electronic assembly and textiles -- and a range of cottage industries producing mainly for the local market. Unemployment was as low as 2%, and other social indicators were similarly impressive. These include universal primary education, a high level of literacy, and a comprehensive health system.

12. Low birth rates and continuing emigration have made population stagnation rather than growth the main demographic concern; the population peaked at 14,333 in the 1940's, and is now at 1880's levels. A small population base and limited economic opportunities have resulted in a declining population size in all but two of the eight intercensal periods of the twentieth century, the most significant occurring between 1921 - 1946, where the advent of the Second World War and more stringent immigration policies of Britain and the United States resulted in a population growth rate of 0.67 percent per year, as is indicated in the following table:
13. Due in part to low levels of fertility, mortality and a net increase of working age persons, Montserrat's population is aging. In 1960, 42.7 percent of the population were below the age of 15 years, while 8.1 percent were 65 years of age or older. In 1991, the percentage of the population under the age of 15 fell to 26%, while the percentage of those 65 years or older rose to 14.0.

GROSS DOMESTIC PRODUCT BY ECONOMIC ACTIVITY AT FACTOR COST In Current Prices (EC\$ Millions) and as a percentage of GDP								
	1980		1985		1990		1993	
	Current Prices	% GDP						
Agriculture	2.40	4.1	4.31	4.9	4.07	2.5	7.55	4.8
Crops	1.13	1.9	2.23	2.5	1.22	0.7	3.33	2.1
Livestock	0.63	1.1	1.10	1.2	1.57	1.0	2.39	1.5
Forestry	0.37	0.6	0.48	0.5	.053	0.3	0.58	0.4
Fishing	0.27	0.5	0.50	0.6	0.75	0.5	1.25	0.8
Mining & Quarrying	0.36	0.6	1.12	1.3	1.35	0.8	2.39	1.5
Manufacturing	3.48	6.0	5.12	5.8	3.83	2.3	3.53	2.2
Electricity & Water	1.85	3.2	3.29	3.7	2.62	1.6	4.19	2.7
Construction	5.23	9.0	7.09	8.0	54.99	33.4	19.99	12.7
Wholesale & Retail Trade	8.92	15.3	12.64	14.3	16.20	9.8	17.95	11.4
Hotels & Restaurants	1.75	3.0	3.59	4.1	5.83	3.5	7.14	4.5
Transport	3.51	6.0	6.01	6.8	11.51	7.0	12.97	8.3
Road Transport	1.45	2.5	2.71	3.1	5.73	3.5	6.05	3.9
Sea Transport	1.11	1.9	1.44	1.6	4.68	2.8	4.70	3.0
Air Transport	0.95	1.6	1.86	2.1	1.10	0.7	2.20	1.4
Communications	0.75	1.3	4.44	5.0	7.00	4.3	10.96	7.0
Banks & Insurance	2.67	4.6	5.71	6.5	14.00	8.5	14.68	9.3
Real Estate & Housing	14.28	24.4	14.18	16.1	18.70	11.4	25.35	16.1
Government Services	8.7	14.9	14.35	16.3	22.31	13.6	26.57	16.9
Other Services	6.4	11.0	10.61	12.0	12.08	7.3	14.04	8.9
Less Imputed Service Charge	1.89	3.2	4.28	4.9	9.92	6.0	10.21	6.5
Total	58.41	100%	88.18	100%	164.50	100%	157.10	100%
Average Annual Growth Rate	n/a	n/a	8.61%	n/a	13.54%	n/a	11.17%	n/a

Source: OECS/EAS and the Statistical Office - GOM

POPULATION DEMOGRAPHICS 1881 to 1991

	Sex			Total	Population Growth	
	Male	Female	Ratio (Males per 100 Females)		Average Annual	% Rate
1881	4,639	5,444	85	10,083	139	1.48
1901	5,580	6,635	84	12,215	45	0.38
1921	5,094	7,026	72	12,120	-8	-0.06
1946	6,362	7,971	79	14,333	89	0.67
1970	5,395	6,103	88	11,498	-67	-0.57
1980	5,582	6,024	92	11,606	11	0.09
1991	5,290	5,349	98	10,639	-88	-0.80

Source: Census 1980, Tables 1991 Census.

POPULATION DISTRIBUTION BY AGE GROUPS 1960 to 1991

Year	Age Groups						
	< 4	5 - 9	10 - 14	15-19	20-24	25-64	65+
1960	14.6	14.8	13.3	10.8	6.0	32.4	8.1
1970	13.5	14.0	12.2	9.4	7.8	32.2	10.9
1980	8.4	11.7	11.7	10.7	8.6	35.7	13.1
1990	8.5	10.0	7.5	8.2	8.6	43.4	14.0

Source: Census 1980, Tables 1991 Census.

14. Good economic management, under the fixed exchange rate regime common to OECS countries (and the requirement as a dependency to at least balance the recurrent budget) resulted in low inflation rates and stable business conditions. The Government generated surpluses in 1985-89 equivalent to about 2% of GDP. Aid grants primarily from the United Kingdom (U.K.) (and limited soft loan finance, leaving very low external debt ratios) have provided overall budgetary balance. These official inflows, together with tourism receipts, private investment flows, and remittances from abroad produced a sustainable balance in the external accounts.

15. The hurricane in 1989 drastically altered this situation, resulting in loss of tourism earnings, reduced agricultural production and a drop in manufacturing to under 3% of GDP. Expansion of the construction and transport sectors during reconstruction produced large GDP increases of 28.55% between 1989-1990 and 17.88% between 1990 and 1991. As the peak passed, there was a correspondingly large fall in 1992 that left the economy in recession, with improved and updated infrastructure but also with increased unemployment rates that may exceed 6% and an urgent need for a revival of normal activity.

16. The Government's development strategy accordingly emphasizes tourism as the lead development sector, together with the restoration of the agricultural export base, the light manufacturing sector and offshore financing activities. From the economic standpoint, the critical needs are for the development and diversification of transport facilities. With new port investments in place, the next step is to develop the airport to reduce the dependence on small aircraft service from neighboring Antigua and permit some diversification of services for tourism and other export development.
17. The public sector investment programme (PSIP) being revised for 1994-96 includes some 120 projects, most requiring aid funding, with total costs estimated at US\$75 million. The economic infrastructure category accounts for US\$44 million (58%) of which US\$30 million would be for the new airport; roads and port development are the other main areas. Public utilities (power and water) account for US\$10 million (5%) and there are similar provisions for agricultural and environmental development and for investment promotion and industrial development. Because of the concentration on infrastructure projects, especially the airport, the share of the social services (US\$17 million, or 23%) appears low but provides for major improvements in education and health facilities. Funding, however, may present major problems, given the narrowing opportunities of Montserrat especially for grant aid.

C. Economic Policies and the Environment

18. Economic policies have been generally conducive to environmentally sustainable development. The current commitments are to (a) further develop the island's tourism potential; (b) increase self-sufficiency in agriculture; and (c) expand light manufacturing (mostly in units employing up to 50 persons, and utilizing the existing industrial estate) and the services export base.
19. As noted, tourism development has been oriented primarily towards the development of an expatriate retirement community, involving home construction largely financed off-shore and a relatively low level of cruise ship visits or tour groups. This unique, low density tourism style, emphasizing residential development and its related service sectors in contrast to the "mass tourism" approach adopted by many regional countries, has tended to both preserve environmental quality and protect the economy from de-stabilizing external developments. The expatriate community has a vested interest and active role in preserving natural and historical assets. Injecting new dynamism in this area would be a prime focus of the Government and private sector, once two environmental provisos are observed:
 - (1) New land developments should be allowed only where they meet the full requirements for environmental protection;
 - (2) The mining of beach sands for new construction should continue to be totally discouraged (most materials for tourism construction are imported, duty free, under the Hotel Aids Ordinance; this should extend to all villa development and, in addition, stronger controls over the use of beach sands is essential).
20. Other dimensions of tourism include the potential for nature tourism, national park development and the restoration of historic sites, discussed later. For other visitors,

including what should now be a revived cruise ship trade, the preservation of Plymouth's waterfront, town center and other points of interest should also be given priority. Good environmental management is essential to the future of all forms of tourism.

21. Stagnation and decline in agriculture has occurred despite a high level of Government technical support. In 1989 the hurricane destroyed the season's crops, large areas of forest and much of the fishing fleet; since then, reconstruction has drawn labor away from the sector, and production has been even lower. The basic problems of the sector, however, predate these events. Land use policies must be the main concern. Much of the available high quality land comprises Government-owned agricultural estates administered by the Land Development Authority (LDA), established in 1971 and controlling about 3,000 acres of land. About a third of this is rented to farmers on a yearly renewable basis, and although a number of initiatives have been attempted to address this problem in the past there continue to be no formal rental agreements or controls over land use. This is a textbook prescription for low agricultural investment and poor use (or non-use) of a prime national resource.
22. Much good land has been transferred for residential tourism and other development but there remains an ample supply for agriculture. Greater security of tenure would at least provide the basic incentives for more productive land use and the redevelopment of commercial food and tree crops and livestock production, on this land and the privately owned estates. Land tenure reform involving the reallocation of LDA land from short-term to long-term lease arrangements is perhaps the most urgent of the measures to be taken to reconcile developmental and environmental needs. This is now being undertaken. Combined with improved storage, processing and especially marketing facilities, and perhaps a young farmer (and fisheries) development package, this would allow for increased production of high quality foods for the domestic market and niche export markets, and encourage environmentally sound agriculture on available lands.
23. Investment incentives focus appropriately on vegetable, fruit and local livestock production and processing in the agriculture sector and, in manufacturing, on light industries employing up to 50 people, as well as off-shore services and, of course, tourism accommodation and amenities. The approach is consistent with the environmental constraints to larger scale development, including the limitations of water, power and other natural resources.
24. In the energy sector, where some renovation and expansion will soon be needed, any major new developments would significantly enlarge generation requirements; at present the Government-owned Montserrat Electricity Services (Monlec) operates at close to capacity. It has maintained revenues at a level generally sufficient to produce a modest surplus over current expenditure. Prices include a basic tariff plus a variable charge to cover imported fuel costs, so that subsidies have been avoided. An increase in the basic tariff has been negotiated. However, further increases will be required to contribute to the capital costs of expansion of the system as this becomes necessary. The feasibility of alternative energy from wind and geothermal sources is being examined.

25. In the telecommunications sector, Cable & Wireless Limited provides a modern, efficient and private sector system with room for expansion at relatively low cost.
26. The water supply system for which the Montserrat Water Authority (MWA) is responsible also operates without subsidy, supplying 97% of households (73% with their own connection) mainly from mountain springs. The supply is of good quality and adequate for existing needs (and modest increases, e.g., for tourism accommodation and the new airport). However, conservation is being encouraged. The water rates combine a charge based on usage and one on property value. Tariff increases, together with efforts to contain expenditures, have allowed MWA to cover approximately 80% of its recurrent costs.
27. Pricing and other economic policies have thus been generally appropriate, without the major distortions that have emerged in some other countries.

D. Private Sector Participation

28. Montserrat's small size and cohesion appear to assist a positive and productive interaction between the Government and the private sector in the preservation of the island's unique environment. Public - private sector co-operation centres around the National Trust, a body established by statute, to conserve the natural and built heritage of Montserrat. Although membership of the Trust is still predominantly expatriate, Montserratians are performing an increasingly important role, particularly in the management of the Trust and the composition of its committees. The fact that many public servants are members of the Trust epitomises its capability for public - private sector collaboration.
29. However, the degree of private sector participation could be enhanced by increasing the opportunities for public consultation in decision making. The Montserrat situation is one in which the democratization of decision-making is both necessary and feasible. The necessity arises from the difficulty of avoiding conflict of interest situations where Montserrat's small size facilitates canvassing public comment. Although public participation will be part of the process of the preparation of the physical development plan, provision should also be made for it in the development control/EIA process.

II. ENVIRONMENTAL PRIORITIES

A. Land Use

30. While there has been hitherto little systematic allocation of land to its optimum usage on the basis of a national plan, land development policies have been guided primarily by a 1967 national land capability study undertaken through the University of the West Indies. The removal of a number of lands from agricultural production for residential development has resulted, not from technical or long-term considerations, but from ad hoc short-term expediency. This deficiency is particularly critical in an island of a mere 10,200 ha where there is no large land mass to absorb errors of inappropriate allocation.

31. Such expediency began during the period of European colonization when original natural forest land was converted to lucrative agricultural plantations of indigo, tobacco, sugar, banana, and later cotton. Although the steep mountain slopes above 1500 feet were traditionally left undisturbed, more than two-thirds of the island was deforested with no thought given to a system of forest reservation for their direct and indirect benefits in perpetuity. To date only one forest reserve has been established in Montserrat, the 30.4 ha Silver Hill Forest reserve in the north of the island, the watershed value of which is minimal.
32. Poor agricultural practices led to soil depletion and erosion with consequent reduction in land productivity and agricultural profitability. During the late 1960's, as a result of a national policy geared towards the promotion of residential tourism and the expansion of the service sectors, it then became expedient to gradually convert increasing amounts of prime agricultural land to residential, municipal, and commercial use. It can be assumed that at least 20 ha annually of potentially productive agricultural lands are being shifted to alternative usages.
33. The abandonment of estate agriculture encouraged a segment of peasant farmers, whose traditional agriculture is actually biased towards animal husbandry, to allow their animals to graze freely, regarding all land, including the remaining forest, as common pastures. The devastating effects of loose animals, especially goats, on vegetation, soil conservation and water supplies present Montserrat with one of its most challenging environmental problems.
34. In 1992, in an effort to address rural land use issues, a zoning plan was proposed for classifying agricultural and forested lands. Lands were designated for use as agro-forestry-livestock and livestock exclusively, in addition to two Forest Reserves at Centre Hill and Soufriere Hills. The greater part of the southern forest reserve is designated for the eventual development as the major part of the national parks system. Additionally, the protected forests and conservation areas proposed by the plan allows for a system of protected areas, pieces of which would eventually be added to a national parks system. This update will feed into the National Physical Development Plan now under preparation with assistance from the UNDP.
35. The Government has recognized that integrated planning for guiding the use of agricultural and forested lands and upland watersheds is a vital step towards orderly, efficient and truly sustainable development. Such integrated natural resource management planning is highly appropriate for a small island like Montserrat whose natural resources are concentrated in a very limited space.

Action

36. During the next three years the Government will prepare an integrated natural resources management plan. This will be done simultaneously with the completion of the National Physical Development Plan. Data from this plan will be collated with those from the Agricultural Zoning Plan, the Forest and Watershed Zoning Plan and the System Plan for Parks and Protected Areas. Coastal resources data will be put together with this terrestrial information and integrated into a Geographic Information System (GIS). The GIS will form the basis of the Integrated Natural Resources Management Plan.

B. Watershed Management

- 37.** The watersheds of the Centre Hills catchment and the Soufriere Hills catchment are home to several spring sources which supply Montserrat with 85% of its fresh water supply. Although the total amount of the island's lands under forest have increased significantly to between 58% to 70%, a survey conducted by the MWA since Hurricane Hugo showed that existing spring sources have been affected by the lack of forest cover in the watershed areas. Even before Hugo, watershed degradation was taking place, largely because of the land use problems referred to above and because of an insufficient appreciation of protection forestry in land use considerations. In small island ecosystems, forestry comes into its own, not as a timber producing activity, but as a cultural practice for watershed management.
- 38.** The MWA has maintained that the lack of clearly defined boundaries for agricultural activities continue to create conflict between the subsistence farming needs of small farmers and livestock owners and the protection and conservation of the water resources for national use. Watershed degradation as a result of agricultural practices has been on the decrease in recent years, with a small number of farmers occupying relatively small areas of land. Conversely, the problems associated with loose livestock has resulted in accelerated soil erosion, the removal and prevention of vegetation and the possibility of contamination of water supplies by animal droppings.
- 39.** The MWA shares responsibility for managing watersheds with the Forestry Division. The MWA handles Water Conservation Areas (i.e lands within a 100 yard (91.4 m) radius of specified water courses), while the Forestry Division is responsible for the surrounding watershed. This fragmented responsibility for small catchments on an island the size of Montserrat does not lend itself to efficient well-coordinated watershed management and has therefore been addressed under the proposed Forestry, Wildlife and National Parks Legislation. Under this legislation, a National Forestry, Wildlife and National Parks Boards will be established upon which the MWA will sit as an ex-officio member.
- 40.** A start was made to putting watershed management on a stronger footing in the 1992 National Forestry Action Plan (NFAP). To address the issue of integrated watershed management, the NFAP identified 15 projects including one that referred specifically to watershed rehabilitation and management and two other projects related to agro-forestry. The Plan was reviewed by the British Development Division and the key elements of those projects with watershed and agro-forestry biases were consolidated into a Core Support Project (CSP). The CSP provided for the protection of the key watersheds and catchment areas of Corbett Springs, Killiecrankie, Olveston/Runaway Ghaut, Lawyers, and Gingerground. All these areas are included in an independent watershed management proposal put forward by the MWA.
- 41.** The CSP, like the NFAP, has suffered delays in its implementation. All the components of the CSP are appropriate for inclusion as supplemental components of the NEAP.

Actions

42. During the next year the Government will survey, demarcate and map forest reserves and key water catchment areas. At the same time co-management committees involving farmers and local communities will be established. In the following year, farmers and local communities will be trained in techniques of forestry, agro-forestry, alternative animal husbandry and soil conservation with an emphasis on the development of appropriate local solutions. This training will be put into practice in the third year in pilot projects.

C. Waste Management

43. The limited capacity for the disposal and collection of solid waste is of immediate concern to Government, and the development of a sanitary landfill at White's and the replacement of inoperative collection vehicles are being given the highest priority in any National Waste Management Plan or waste management projects. A 1992 Pan American Health Organization/World Health Organization (PAHO/WHO) report outlined the design of a sanitary landfill at White's, an upgraded collection system, and a draft Solid Waste Master Plan. The recommendations of this report form the basis for much of the development programme for the Environmental Health Division (EHD).
44. Managed by the EHD, White's Landfill is located approximately two kilometers south of Blackburne airport on the island's east coast. The operation of the site can be characterized by improper placement and coverage of waste material, a lack of personnel, poor access for compactor trucks and unregulated access to the site encouraging both illegal tipping and an abundance of loose animals. The EHD attributes these problems primarily to the inadequacy of the existing bulldozer required to perform the necessary trenching and earthmoving tasks required, and the lack of any infrastructural development of the site. An unsurfaced road provides the only access to the site and in times of inclement weather EHD collection vehicles are forced to deposit their waste at the site entrance. Government's lack of title to the site has impeded its development into a sanitary landfill. Given improved management practices, the site has an expected life expectancy of 30 years.
45. Municipal waste collection services are provided by Government to 87% of the island's population, the remaining 13% representing the upper income residential areas serviced by a single private contractor. In 1986 the EHD acquired three 16 cubic yard compactor vehicles, although only one is currently operational and the assistance of the Public Works Department is required. Collection services have become quite irregular, often resulting in refuse overflowing containers and being scattered along the roadsides, a situation that is both unsightly and a potential health hazard.
46. In the absence of a centralized sewerage system, septic tanks are the standard means managing liquid waste on Montserrat. Increased development has given rise to concerns about carrying capacity and soil saturation limits particularly in areas of high residential density and the possible contamination of ground and coastal water resources. Design of the sanitary landfill to incorporate the infrastructure necessary for the final disposal of slurry has been suggested in the PAHO/WHO 1992 Solid Waste Management report.

47. No special procedures exist for the monitoring, use, collection, and disposal of hazardous or toxic waste. Hazardous wastes, including medical wastes, are disposed of at White's Landfill together with municipal waste. The concentration of Montserrat's small industrial sector east of Plymouth presents a localized environmental problem due to the rain-induced leaching. No special mitigation measures are in place.
48. No facilities exist for the disposal of waste oil with the consequence that, with the exception of a very small amount used for mosquito control, it is discarded into ghaunts or drains thereby contributing to the possible pollution of a number of important watercourses.
49. Derelict vehicles, tires, and discarded appliances are a persistent problem in Montserrat that both detracts from the island's natural appeal and provides a potential site for vector breeding. In 1982, under a Canadian sponsored programme, an artificial reef was constructed offshore at Foxes Bay using derelict vehicles and tyre modules. This site was monitored for a period of one year, however the monitoring was not continued and subsequently vehicles that had not been properly cleaned of lubricating oils, as well as hurricane debris (particularly corrugated sheets) were dumped on the reef. The overall impact of this later dumping has not been assessed.
50. With a growing awareness of the importance of environmental conservation and the importance of sustainable waste management techniques, a significant community-based initiative for the recovery of recyclable materials has developed. Although the chief limiting factor to the implementation of this type of programme within the private sector is the small scale of the local economy, a cost/benefit analysis should consider not only the capital and recurrent costs of the recycling facility but the reduced demand for solid waste collection, the extended life of the landfill, and the positive effects of increased level of environmental awareness.

Actions

51. During the next year the Government will initiate the implementation of the draft Solid Waste Management Plan. It will acquire White's Landfill site as well as the heavy equipment and accessories necessary to convert the site into a sanitary landfill. Solid waste collection vehicles will also be acquired. In the following year the Government will develop the landfill and initiate the implementation of the derelict vehicle programme. In the third year, attention will be focussed on special wastes through the implementation of a waste oil collection system and the installation of an incinerator at Glendon Hospital. The Government will also undertake actions to promote programmes for alternate waste management including recycling and waste reduction.

D. Coastal Resources

52. Montserrat's 45 km coastline comprises rocky coasts and cliffs (70%), 15 sandy beaches, all but one comprised of black volcanic sand, and three small areas of coastal wetlands, constituting less than 1% of the shore area. There are few coastal pollution problems and water quality is good, a situation attributable to a well-flushed coastline, the absence of significant estuaries, coastal wetlands or other perennial sources of

freshwater. Montserrat has a narrow coastal shelf which limits the fisheries resource base. While the generalized distribution of marine habitats such as reefs and seagrass beds is documented, there is little quantitative data relating to these habitats.

53. The continual mining of beach sand, out of all proportion to the natural rate of replenishment, has to date been the most serious coastal resource management problem in Montserrat, with implications for coastal erosion, tourism and sea turtle nesting. In the absence of effective law enforcement and royalties, beach sand has traditionally been treated as a free good. In 1993 the Government issued a ban on beach mining throughout the island, with the exception of the very degraded windward coastal beach at Trant's. The use of quarry dust as a substitute for beach sand has been made possible by the installation of a 1 million pound sterling rock crushing plant funded by the British government, although local resistance to the idea of buying sand is considerable and the enforcement of the order to close the beaches to mining continues to be a significant problem.
54. Marine food resources are important to the island's economy, but supply of fresh fish does not meet demand. Although Government provides significant fiscal incentives, a lack of safe harbours for small boats and limited cold storage facilities are major constraints on development. At the same time, there is a growing interest in sports fishing and the recreational use of marine resources, connected with the tourist industry. A perceived conflict of use, between consumptive and non-consumptive uses of Montserrat's marine resources, has become focused by a proposal for the designation of the coastal waters surrounding the northern portion of the island as a Marine Park, as those waters contain much of the island's prime fishing grounds. Hence, the preparation of a plan for the management of this area must involve the concepts of multiple use and co-management, within a system of protected areas. In 1993 a Beach Enhancement Programme was initiated by the MATE with the specific aim of making the beaches more attractive and to provide beach facilities and wardens. While the overall programme is still in the planning phase, works have been initiated at Old Road Bay. The programme will be implemented by Government and private sector groups.
55. One of the three coastal wetlands, at Carr's Bay, has already been severely degraded by siltation, as a result of soil erosion in the Silver Hills area, and the dumping of solid wastes. The second, at the Belham valley has been for the most part displaced by a golf course. The third, Fox's Bay, has been leased to the National Trust for preservation as a bird sanctuary and wildlife refuge. The creation of an artificial reef at Foxes Bay has already been described in paragraph 49. It is recommended that this artificial reef should be surveyed and a monitoring programme be designed and implemented.
56. The Government recognizes that the fundamental problem with respect to coastal resources management is the inadequacy of existing procedures for the co-ordination of the activities of the many agencies with responsibilities in this area. At the same time, in the context of Montserrat's geography, the concepts of the coastal zone and coastal zone management, as distinct from land (and water) management in general, are not useful. Hence, the Government of Montserrat proposes to deal with the co-ordination of the management of coastal resources within an integrated natural resources management framework.

57. In this connection, the Government recognizes the need to clarify the law to ensure that the Development Control Authority be given clear jurisdiction over coastal development, above and below sea level including control over coastal protection structures, land reclamation works, outfall (and other) pipelines and the dumping of solid wastes. Additionally, the Government intends to provide for the inclusion of marine areas in the draft legislation for the creation of a system of parks and protected areas, and for the involvement of the agency with competence in and responsibility for fisheries in the development and management of that system.

Actions

58. Over the next three years, the Government of Montserrat will:
1. Continue the qualitative and quantitative Resource Assessment of the island's marine resources, including the collection and collation of all information on the resource base and the implementation of a targeted fisheries data collection exercise, with a view to integrating marine resources in the Integrated Natural Resources Management Plan;
 2. Explore and experiment with the concepts of multiple use and co-management of marine resources, particularly in the area of the proposed marine reserve, involving the local fishing community and dive operators, to mobilize local support for the proposed marine park;
 3. Review the establishment of additional national anchorages and the development of mooring buoys for the yachting sector;
 4. Undertake a formal and informal education programme for both the public and a number of key groups (including resource managers, law enforcement personnel, teachers, etc.), focussing specifically on the marine environment and the importance of improved resource management techniques.

E. Conservation: The Natural and Historical Heritage

59. Conservation of the natural heritage has taken on increased importance in view of the shift away from agriculture towards tourism as the engine of development. A high priority is being given to eco-tourism in the overall tourism development effort. Government is mindful of the need to develop constructive links with tourism and the private sector and is of the view that this would be greatly facilitated by a fully-developed systems approach to park and protected area management.
60. Outside the system of forest reservation, there are no terrestrial or marine sites enjoying legal protection in Montserrat. The concept of a park and protected area system has been discussed at least since 1970 following establishment of the Montserrat National Trust. The Trust's authorizing legislation lists the acquisition of property as a major objective and has used this mandate to acquire property for the purpose of protection and conservation, although the capacity of the Trust to maintain these sites is strictly limited by available financial and in some cases technical

resources. The most significant natural area under the management of the Trust is the wetlands and pond at Fox's Bay for the purpose of establishing a bird sanctuary. The acquisition of these areas, which in many cases lie on private land, has of necessity been carried out on a piecemeal basis, with a view to their eventual incorporation into a National Parks and Protected Areas System.

61. In 1986, The Trust and the Government cooperated with the World Wildlife Fund (WWF) - U.K. in the development of a proposal for a system of protected natural sites. The consultants recommended the establishment of a research and survey programme, the enactment of legislation, and the placement of all the individual sites protected under the legislation in one Montserrat National Park. This latter idea arose in 1980/81 when the Executive Council accepted in principle the need for establishing a national park in Montserrat. The 1986 study made provision for protecting marine sites and recommended the establishment of a marine park between Little Bay and Marguerita Bay. The successful establishment of this park will be dependent on the harmonization of the activities of conservationists, tourists, divers, researchers, turtle fishermen, sports fishermen and commercial fishermen.
62. The WWF-U.K. has continued to support the activities of the Trust in tangible ways. Though a grant to design the system of parks and protected areas has not materialized, they have pledged funds for Fox's Bay to conduct an ecological assessment, develop a restoration and management plan, and survey and fence the site boundaries.
63. The Trust has proposed that the main body of the park system consist of all lands above 457 m in the South Soufriere Hills. To this core would be added "fingers" that extend below this contour and a few isolated areas chosen for their biodiversity value. There already is sufficient consensus on the biological and ecological significance of the proposed sites that it may be possible for them to serve as the first Schedule of Park and Protected Area Sites to accompany the enabling legislation already drafted. The protected areas will be supported by a system of trails which has been engaging the attention of the Tourism Department and which will be developed within the system of parks and protected areas.
64. It is envisaged that the system will eventually accommodate historical heritage sites. Montserrat's historical resource base includes prehistoric sites identifying Amerindian settlements; military sites which are reminders of the Anglo-Franco colonial rivalries of the seventeenth and eighteenth century; and plantation ruins of the once numerous sugar estates which dominated the island's social and economic development for more than two hundred years.
65. The abandonment of estates, natural disasters, and the lack of funds for site maintenance, in the face of other economic pressures, have all contributed to the deterioration of historic buildings and landmarks. The imperative of tourism, however, has had the effect of increasing appreciation for this part of the national heritage.
66. The Montserrat National Trust has been the flagbearer in efforts at protecting the historical heritage. It has acquired a few landmarks, one at the Bransby Point Battery next to Fox's Bay. Galway's Plantation at the foot of Galway's Soufriere was donated to the Trust by the previous owners. In 1991, the UNDP funded the preparation of a management and development plan for the Galway's Soufriere Natural Landmark and

the Galway's Plantation Cultural Landmark. The implementation of this plan, essential for the tourism thrust, awaits funding.

67. With respect to historical buildings, an inventory was completed for the Trust in 1993.

Actions

68. During the next year the Government will conduct all the data collection and research into natural and historical sites that would be necessary for the preparation of a system plan for parks and protected areas. The plan will be drafted in the following year. The translation of this plan into managed parks and protected area units will take place over the medium to long term as resources permit.

III. LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

A. Environmental Policy

69. The Government of Montserrat has a draft development philosophy. It is also currently engaged in the preparation of a Physical Development Plan for the island, with the assistance of the UNDP. In the interim, environmental considerations are incorporated into the development planning and control process on an ad hoc basis. However, it is recognized that environmental decisions cannot be properly evaluated if they occur as incremental responses to particular development initiatives considered in isolation. What is required is a coherent environmental management philosophy, guided by the consideration of cumulative impacts, which informs the preparation and evaluation of sectoral plans, programmes and projects.
70. The MEP includes a sample 'National Environmental Policy Statement' for Montserrat on the basis of which the Government can, after public consultation, articulate an environmental policy. It is recognized that the existence of such a policy is the foundation on which the preparation of interim guidelines for environmental impact assessment of development proposals, as well as long term planning, must rest.

Actions

71. During the next year, following consultations with representatives of NGO's, the business interests and other community groups, the Government of Montserrat will conduct a national workshop, utilizing the sample document contained in the MEP, and will adopt a National Environmental Policy Statement which spells out the framework for evaluating and monitoring development activities in both the public and private sectors.

B. Legal Instruments

72. Montserrat has no umbrella legislation dealing with environmental management issues. Hence, powers over the environment and development are scattered in numerous pieces of legislation. As the list of the principal environmental laws in Table III-1

shows, the major deficiency is in the area of pollution control, in particular solid wastes management.

73. However, Montserrat is fortunate to the extent that much of this legislation is relatively modern, although its implementation and enforcement have been inadequate to date. Generally, the powers provided by enabling legislation have not been adequately used to make subsidiary legislation. Also, where laws are repealed and replaced, there is a tendency to save old rules and regulations rather than expediting the preparation of new legislation. There is therefore a need to implement the existing legislation through the making of subordinate legislation.
74. Penalties are reasonably adequate and the small size of the island, and of its resident community, facilitates the detection of breaches of the law. However, some environmental legislation, for example the Turtle Ordinance and the Beach Protection Ordinance, have not been aggressively enforced in the absence of vocal public concern about its subject matter. In other cases the intimation of intention to prosecute, for example the abatement of nuisance notices issued under the Public Health Ordinance, is sufficient to secure compliance with the law.
75. With respect to the areas of major concern: the planning and development control legislation contains a number of commendable features, including the fact that it is binding on the public sector, as well as private developers; the provision for the representation of persons outside the public sector on the Development Control Authority; and the provision for appeals in respect of planning decisions by any person affected thereby. However, although the definition of "land", to which the Town and Country Planning Ordinance applies, expressly includes land covered with water, it is doubtful that this includes tidal lands and the seabed. Likewise, as is conventional, the definition of "development" excludes agricultural land uses, including animal husbandry, the control of which is a major problem in Montserrat.
76. Finally, the legislation does not require the environmental screening or assessment of development projects, which is currently requested on a case by case basis. This is unsatisfactory since the absence of guidelines and transparency creates scope for inequities. This deficiency has been addressed under regulations proposed for the Town and Country Planning Ordinance, which will, in part, require the developer by law to undertake an EIA of proposed development projects following the result of an initial environmental screening conducted by Government. In the interim, the environmental assessment of major projects, such as the proposed new airport, should be captured by existing practices.

Table III-1: Principal Environmental Laws

Environmental Law	Date	Authority	Regulations
Town & Country Planning Ordinance	1975	Physical Planning & Development Control	None (In Draft Form)
Land Development Authority Ordinance	1971	Management of Public lands, rural development	None
Agriculture Small Holdings Ordinance	1939	Regulation of tenant farmers	Rentals Regulations 1959
Animals (Trespass & Pounds) Ordinance	1985 1993	Control of loose livestock	None
Pesticides Control Ordinance	1975	Control of importation and use of pesticides	None
Forestry Ordinance	1956	Forest conservation on public and private lands	Regulations 1941 & 1952
Bush Fires Ordinance	1925	Prevention of wildfires	None
Beach Protection Ordinance	1970 1980	Control of beach mining	None
Fisheries Ordinance *	1982	Protect and manage fisheries	None
Turtle Ordinance *	1951	Protect marine turtles	None
Wild Birds Protection Ordinance	1912 1982 1985	Protection of listed bird species	None
Endangered Animals & Plants Ordinance	1976 1982	Protection of endangered species of flora and fauna	None
Plant Protection Ordinance	1941	Control of exotics, plant pests & diseases	Regulations 1951, 1952, 1956
Public Health Ordinance	1981	Maintenance of environmental health, control of public nuisances, etc.	Nuisance Regulations 1983
Derelict Motor Vehicle (Disposal) Ordinance	1973	Removal and disposal of derelict vehicles	None
Prevention of Oil Pollution Act (Overseas Territories)	1971	Control of oil pollution	Order, 1982
Water Authority Ordinance	1972 1975 1985	Ensure water supply, conserve sources	Supply Regulations, 1967 Conservation Areas Resolution, 1985
Underground Water Ordinance	1967	Control ground water pollution	None
National Trust Ordinance	1967	Establish National Trust for conservation of built & natural heritage	None

* The Fisheries Ordinance 1982 and the Turtle Ordinance 1951 have been combined under the proposed OECS Harmonized Fisheries Legislation

77. In the area of natural resources management, an important step in seeking to mitigate the environmental degradation being caused by loose livestock has been taken by the enactment of a new Animal (Trespass and Impoundment) Ordinance. However, since the adoption of command and control methods alone will not solve this complex socio-economic problem, it is noteworthy that the Government is taking other steps to complement law enforcement. Apart from appointing loose livestock wardens and erecting 11 pounds throughout the island, the Government has established 20-30 fodder banks and plans to provide fencing materials to farmers at minimal costs.
78. In addition the related problem of insecurity of tenure of the government's agricultural land tenants is being addressed by the Land Development Authority. Notices have already been issued terminating all the annual tenancies governed by the obsolete Agricultural Small Holdings Ordinance. These will be replaced from January 1994 by contracts of tenancy, for 10 or 25 years for agricultural and agro-forestry farms respectively. These leases, to be issued under a revised Land Development Ordinance will be inclusive of provisions for compensation for improvements upon expiry of the term and will be subject to environmental conditionalities. It is expected that this change will substantially transform the agro-economy and land management practices of the farming community in Montserrat.
79. The MEP omits consideration of the Water resources and supply situation in Montserrat. However, the inadequacy of the legislation in this area was identified under the NFAP. The Montserrat Water Authority Ordinance recognizes the private ownership of water rights, which is contrary to the treatment of water found in most modern legislation as a public resource, over which the state should assert management in the public interest. This imposes an extraordinary financial burden on the MWA for the acquisition of water rights in addition to reservoir sites and pipelines easements, which needs to be addressed. Likewise, the powers granted the MWA to prevent the pollution of springs and water courses, by regulating deforestation and cultivation within a limited radius, are difficult to enforce. Legislation for a system of parks and protected areas and the Forestry, Wildlife and National Parks Board should facilitate the integration of the entire area of important watersheds with inputs from both the agencies responsible for forestry and water resources.
80. Deficiencies in the legal framework also affect the conservation of the built environment and the control of antiquities. The Town and Country Planning Ordinance contains no provision for the preservation of listed buildings or historical landscapes, a deficiency which is reflected in the incipient degradation of the charming urban landscape of central Plymouth. Likewise the control of archeological excavations, the removal of artifacts and the export of other items of historical interest, are not yet covered by legislation. This deficiency has been addressed under a draft bill for the Preservation of Historical Buildings, Sites and Artifacts that is in an advanced state of preparation.
81. However, the Government is aware of many of the deficiencies in the legal framework for environmental management. Draft litter legislation is currently before Cabinet, while draft forest, wildlife and parks and protected areas legislation has been sent to the competent agency for comment. The Government is also working on antiquities legislation. Where possible the intention is to harmonize environmental legislation with the other OECS countries and to a lesser extent the CARICOM countries. The British

Government has also agreed to assist Montserrat in carrying out a complete law review and reform exercise, inclusive of all the environmental laws, in the near future.

Actions

- 82. During the next three years the Government of Montserrat will:**
- 1. Finalize and enact the environmental legislation that is currently in preparation;**
 - 2. Review and revise the existing environmental legislation as part of its law review and reform exercise;**
 - 3. Examine and address the issue of assimilating the status of water to that of other publicly controlled natural resources;**
 - 4. Enhance the capacity of the judicial system to deal with environmental law enforcement through the appointment of a resident Judge and a second Magistrate;**
 - 5. Ensure that sufficiently trained personnel and equipment are made available for the enforcement of environmental legislation.**

C. Institutions

- 83. Montserrat is a British Crown Colony or Dependent Territory. The institutional framework for its government is illustrated in Figure 1. The institutions with key environmental responsibilities are identified in Table III-2.**
- 84. As this Table indicates, most of the environmental functions of the Government of Montserrat are allocated to the Ministry of Agriculture, Trade & the Environment (MATE). However, certain existing and proposed institutional arrangements are suboptimal. The division of responsibilities, between the Forestry and Environment Division (MATE) and the MWA, over different parts of individual watersheds, is one example. The failure to include the Fisheries Division the proposed management structure for parks and protected areas is another.**
- 85. Given the nature of the environment it is impossible to concentrate all powers touching it in the hands of any one agency. However, it is essential that integrated management strategies be used in environmental management. Hence, overcoming the structural problem of having to house various functions in different line Ministries is usually approached through the establishment of coordination mechanisms, eg inter - agency coordinating committees. In Montserrat this device has been used in the form of the Forestry Board, the Development Control Authority, etc.**
- 86. A peculiar advantage that Montserrat has in respect to coordination is its small size and the corresponding simplicity of its institutional framework, as illustrated in Figure 1. The small number of line Ministries reduces the complexity of the task of inter - agency coordination. Indeed, there are indicators that there is a measure of**

redundancy in the existing coordination mechanisms, because the same persons meet as members of various coordinating committees.

Table III-2: Key Institutions with Environmental Responsibilities

INSTITUTION	DIVISION/UNIT	RESPONSIBILITY
MINISTRY OF AGRICULTURE TRADE & THE ENVIRONMENT	Forestry and Environment	Forest, wildlife and watershed management, environmental coordination
	Forestry Board	Protection of forests on public & private land
	Fisheries	Management and development of living marine resources
	Physical Planning	Preparation of plans review and development proposals
	Development Control Authority	Control of public and private building and engineering operations, and subdivision of land
	Land Development Authority Pesticides Control Board	Leases of agricultural lands, rural village expansion Control of importation & use of pesticides
OFFICE OF THE CHIEF MINISTER	Tourism	
MINISTRY OF FINANCE & ECONOMIC DEVELOPMENT	Development Unit	Economic planning and preparation of PSIP
MINISTRY OF EDUCATION HEALTH & COMMUNITY SERVICES	Environmental Health	Disposal of solid wastes and effluents, control of vectors, and environmental conditions.
MINISTRY OF COMMUNICATIONS PUBLIC WORKS & SPORTS	Montserrat Water Authority (MWA)	Water conservation & supply
	MONLEC	Power Generation and Supply

87. At the same time, the smallness of the system places limits on the professional pyramids in many areas of management. In most areas, the higher or more specialized professional ranks, in which persons would be under-utilized, are absent. This problem affects all Small Island Developing States (SIDS), including the other OECS countries, and can best be solved by shared capacity building at the sub-regional and regional level. The merits of this approach are recognized by the Government which is actively involved in the existing OECS programmes for environmental and planning law reform, natural resources management and physical planning.

88. Internally, the proposal for the establishment of a Forestry, Wildlife and Parks and Protected Areas Board, with authority under the draft legislation over these matters, should be expanded to include Fisheries and Marine Parks and the involvement of the Fisheries Division. The concept which should evolve is that of an integrated natural resources management authority perhaps under the auspices of an Environmental Unit within the Ministry of Agriculture, Trade and the Environment. The technical capacity of the Forestry and Fisheries Division of MATE will be necessary to this agency and it should assume a supervisory role over these organizations. Responsibility for watershed management should be vested in this agency, with involvement by the MWA through participation on the Forestry, Wildlife and National Parks Board.
89. The MEP identifies the inadequacy and effectiveness of development planning and control functions as the central environmental issue facing Montserrat. Hence, a similar approach must be taken to improve the efficiency and coordination of the Development Unit, the Physical Planning Unit, the Development Control Authority and the Land Development Authority. The powers over planning, public sector investment, development control and the management of the state's land bank, are or should be intimately related. The merger of some or all of the relevant agencies into one institution, preferably under the Office of the Chief Minister or the Ministry of Finance and Economic Development, is preferable to the creation of a new coordinating committee without statutory authority. In the interim however, regulations proposed for the Town and Country Planning Ordinance will ensure the more effective coordination within the existing institutional framework.

Actions

90. Within the next three years the Government will:
1. Strengthen its institutional capacity for integrated natural resources management by strengthening the Environmental Unit and bringing into being an institution analogous to the proposed Forestry, Wildlife and National Parks Board;
 2. Continue the review of the institutional arrangements for development planning and control;
 3. Participate with the OECS countries in the development of a shared institutional capacity for environmental management at the regional level.

D. Public Awareness

91. Actions to safeguard the environment in Montserrat have to date depended largely on the enforcement of existing environmental laws. Although the society is predominantly law abiding and non-litigious, this approach has proven inadequate. Its failings are attributable both to inadequacies in the legal framework and to the unsuitability of command and control methods alone for altering traditional practices in areas of socio-economic importance, for example in respect of the mining of beach sand and goat rearing. However, the fact that the leading NGO, the Montserrat National Trust, is extremely vibrant is a strong positive indicator of growing public

awareness and concern about environmental issues. Additionally, a number of outreach programmes aimed at raising environmental awareness are currently being carried out by various agencies in Montserrat.

92. Environmental Health studies form part of the school curriculum, in addition to which radio quizzes and competitions on this subject are promoted by the Ministry of Education, Health and Community Services. Both MONLEC and the MWA are engaged in consumer education programmes aimed at energy and water conservation. The Chamber of Commerce is engaged in a beautification programme in Plymouth, while the National Trust's Environmental Education Committee sponsors an annual "Best Village" competition amongst its on-going activities. In addition, the Governor is promoting an inter-school competition for environmental projects and is also promoting the involvement of post school-aged youths in the Commonwealth Youth Service Awards Scheme, which will focus next year on the environment.

Actions

93. In the next three years the Government of Montserrat will promote public awareness of environmental issues by:
1. Continuing on-going environmental education programmes and projects, including involvement in international efforts;
 2. Increasing public awareness of critical environmental issues through a series of specific environmental education campaigns (ie solid waste management, loose livestock, fisheries);
 3. Expanding public involvement in development/environment decision - making by the process of public participation in the preparation of the Physical Development Plan, as provided for by the relevant legislation;
 4. Creating opportunities for community co-management of natural resources where appropriate, for example in the areas of marine resources and watershed management.

IV. STRATEGY FOR ENVIRONMENTAL ACTION

94. With a large environmental agenda but strictly limited administrative and financial resources to apply to either developmental or environmental programmes, the Government has to focus very clearly on the priorities for environmental action over the next 2-3 years, while working on the prescriptions for the longer term that can be embodied in a fully comprehensive action programme. The purpose of this section is to specify the set of actions that can be recommended for the short term, and in particular those for which external support may be available.
95. The following matrix is designed to present such a programme in summary form. Where appropriate, a short project profile is attached to indicate the objectives, scope, duration and financial or technical assistance requirements for specific components of the proposed programme.

STRATEGY FOR ENVIRONMENTAL ACTION
(italics indicate projects detailed in Draft NEAP appendix)

ENVIRONMENTAL ISSUE	YEAR ONE	YEAR TWO	YEAR THREE
LAND USE	Complete National Physical Development Plan	Integrate data from National Physical Development Plan, Agricultural Zoning Plan, Forest and Watershed Zoning Plan and the Parks Plan into GIS	Prepare integrated natural resources management plan
WATERSHED MANAGEMENT	<i>Survey and demarcate forest reserve boundaries</i>	<i>Establish extension and training programmes in forestry, agro-forestry, alternative animal husbandry, soil conservation</i>	<i>Establish tree plantations</i> <i>Establish demonstration agro-forestry plots</i> <i>Initiate soil conservation works</i>
WASTE MANAGEMENT	<i>Acquire White's Landfill</i> <i>Acquire Landfill Equipment</i> <i>Develop strategies for alternate waste management</i>	<i>Develop White's Landfill</i> <i>Implement derelict vehicle programme</i>	<i>Implement waste oil collection system</i> <i>Install incinerator at Glendon Hospital</i>
COASTAL RESOURCES	Collate existing resource information Collect Fisheries data Identify user groups in area of proposed reserve Conduct Formal and Informal training in Coastal Zone Management	Collate data and carry out Resource Assessment Develop multiple use and co-management protocols Conduct Formal and Informal public marine education programmes	Integrate coastal resources into Integrated Natural Resource Management Plan Implement co-management of reserve area Prepare and implement plan for anchorages identification
CONSERVATION	<i>Collect and collate data on natural and historic sites</i> <i>Initiate supplementary research</i>	<i>Prepare system plan for parks and protected areas</i>	
ENVIRONMENTAL POLICY	Publish working paper, convene national public consultations	Conduct National Workshop, finalize and adopt policy	
LEGAL INSTRUMENTS	Finalize and enact draft environmental legislation	Review and revise all environmental laws in law reform programme	
INSTITUTIONS	Strengthen Capacity of Environmental Unit <i>Commence Country Capacity Project</i>	Review institutional arrangements for planning and development control Enhance regional co-operation at OECS level	
PUBLIC AWARENESS	<i>Establish and Continue on-going public education programmes</i> Participate in Commonwealth Youth Awards Scheme Engage in subject related environmental education campaigns		

APPENDIX A

PROJECT PROFILES

- COUNTRY CAPACITY PROJECT
- UPPER WATERSHED MANAGEMENT AND LAND REHABILITATION PROJECT
- SYSTEM PLAN FOR PARKS AND PROTECTED AREAS
- ECO-TOURISM INFRASTRUCTURE PROJECT
- ENVIRONMENTAL EDUCATION
- NGO SMALL PROJECTS FUND
- WASTE MANAGEMENT PROJECT

PROJECT NAME:

Country Capacity Project

PROBLEM:

Montserrat does not presently possess the institutional capability to execute the range of priority projects identified in the NEAP over an intensive three year period. There is a need to upgrade the capacity of the country to implement the NEAP, bearing in mind the sub-regional dimensions of capacity building.

OBJECTIVE:

To build the necessary capacity to initiate the implementation of the NEAP and to enable key agencies to effect long-term environmental management.

DESCRIPTION:

Project activities will include:

1. Preparation of project documents based on profiles and final costing.
2. Completion of arrangements for project funding.
3. Identification of training needs and initiation of training, including strengthening of EIA capacity.
4. Assess capability of lead agencies and identify strengthening needs.
5. Assessment of private sector human and financial resources.
6. Establish systems for project cycle management co-ordination.
7. Develop public information systems.
8. Develop a monitoring system for the NEAP.
9. Integrate national capacity building into sub-regional capacity building through liaison with the OECS Secretariat.

DURATION:

1 year

NATIONAL AGENCY:

The Development Unit working in close collaboration with the relevant technical divisions.

PROJECT NAME:

Upper Watershed Management and Land Rehabilitation Project

PROBLEM:

Lack of systematic land use planning and a comprehensive forest reservation system has led to degradation of the islands watersheds over time. Today, these watersheds are being overrun by loose livestock that destroy vegetation, contaminate water, and threaten serious soil erosion. While the degradation of the upland watersheds could be arrested by improved livestock management practices and a system of forest reservation and management, there remain large tracts of degraded land, below the 475 m contour, that can be rehabilitated and brought into production. Such rehabilitated land, however, will be subject to the same destructive threats that caused their earlier demise unless the social and economic problems affecting undesirable farmer behavior are addressed.

OBJECTIVE:

To protect key watersheds and catchments and establish pilot land rehabilitation schemes through co-operation between Government, farmers, and local communities.

DESCRIPTION:

Project activities will include:

1. Enactment of legislation and gazetting of Forest Reserves additional to Silver Hills. These will include Centre Hills, Soufriere Hills, and possibly, Garibaldi/St. George's Hills.
2. Survey and demarcation of forest reserve boundaries.
3. Survey and mapping of key water catchment areas. The principal focus will be on Corbett Springs, Killiecrankie and Monkey Springs, Olveston/Runaway Ghaut and Lawyers Springs, and Gingerground Springs. Other possible springs for consideration include Fogarthy, Quashie and Blackwood.
4. Initiation of basic management actions, including reforestation.
5. Initiation of anti-erosion techniques in selected ghauts.
6. Reconstruction of catchment boxes, intakes and access roads.
7. Selection of pilot areas for rehabilitation and gazetting of the areas as Conservation Areas under the new legislation.
8. Establishment of co-management committees from farmers and the local community.

9. Establishment of extension and training programmes in forestry, agro-forestry, alternative animal husbandry, and soil conservation.
10. Establishment of pilot plantations of fuelwood, fodder, timber and handicraft species.
11. Establishment of demonstration agro-forestry plots.
12. Initiation of soil conservation works.

DURATION:

3 years

NATIONAL AGENCY:

This project will be best executed under a statutory Forestry, Wildlife and National Parks Board.

PROJECT NAME:

System Plan for Parks and Protected Areas

PROBLEM:

Montserrat is heavily dependent on its natural and historical heritage to sustain its tourism industry which is the mainstay of the economy. Yet, the preservation of natural and historical sites has not been approached systematically within the appropriate legal framework. A system blueprint for parks and protected areas is essential for the prioritization of management activity on the ground and as a framework for private sector participation in conservation.

OBJECTIVE:

To prepare a system plan for parks and protected areas.

DESCRIPTION:

Project activities will include:

1. Enactment of already drafted framework legislation including provision for a system of parks and protected areas.
2. Collection and collation of all relevant information on unique natural and historical sites, including trails.
3. Initiate supplementary research into national vegetation maps, distribution and status of threatened species, marine resources, and assist with ongoing research on ecological processes.
4. Shortlist and categorize areas prioritized for protection and incorporate them into a standard system plan, taking into consideration areas already under development on an ad hoc basis.

DURATION:

2 years

NATIONAL AGENCY:

This project should be implemented by the Forestry, Wildlife and National Parks Board.

PROJECT NAME:

Eco-tourism Infrastructure Project

PROBLEM:

In the absence of a system of parks and protected areas, the development of selected areas as eco-tourism attractions has been taking place on an ad hoc basis. This has resulted in the under-funding of projects aimed at developing the eco-tourism product. The eco-tourism industry, therefore, remains undeveloped as the infrastructure cries out for improvement and tours to natural and historical areas are disorganized, un-interpreted and unstructured. There is need for government/private sector co-operation in the development of selected eco-tourism sites within the context of the system plan for parks and protected areas.

OBJECTIVE:

To develop selected areas within the parks and protected areas plan to demonstrate the achievement of a range of management objectives relating to providing touristic attractions and conserving features of ecological and historic importance.

DESCRIPTION:

Project activities will include:

1. Preservation of Galway's Estate Historical Landmark as a historical demonstration site through partial stabilization of key structures.
2. Development of the Nature Trails system to include clearing, waymarking, and trail improvements. Priority trails for development will include:
 - a. White River Valley to Great Alp Falls.
 - b. Galway's Soufriere System.
 - c. Spring's Estate to Chance's Peak
 - d. Old Road Bay/Fox's Bay to Bransby Point.
 - e. Central Trail System (Molyneux to Windy Hill).
 - f. Little Bay to Rendezvous Bay.
3. Support of WWF-U.K. funded activity at Fox's Bay Bird Sanctuary by developing an education facility at the site.
4. Development of a comprehensive interpretive programme to include leaflets and trail signs for specific high-profile attractions, including those listed above.

DURATION:

3 Years

NATIONAL AGENCY:

The lead executing agency will be the Montserrat National Trust with the assistance of the Forestry Division, the Tourism Department, the Development Unit and the National Youth Council.

PROJECT NAME:

Environmental Education

PROBLEM:

The most serious environmental problems in Montserrat are attributable to individual behavior patterns and, hence, can be ameliorated by public education. Additionally, the sustainable development of the island's limited resource base requires the collaboration of the community. The desire for involvement can only be evoked by raising public awareness.

OBJECTIVE:

To enable the government to increase public awareness of environmental issues amongst the population in general and school children in particular.

DESCRIPTION:

1. Identify existing activities (especially those implemented by the Environmental Education Committee of the National Trust and government agencies);
2. Review and obtain existing suitable educational materials, with specific reference to the materials developed by the Caribbean Conservation Association (CCA), OECS-Natural Resources Management Unit and other OECS/CARICOM countries for use in the region;
3. Establish specific activities for priority action for each of the following target groups:
 - * teachers
 - * community leaders
 - * enforcement personnel
 - * mass communications personnel
4. Prepare programme document detailing for each target group goals, objectives, activities and responsibilities and time frame for action;
5. Facilitate the strengthening of organization, structuring and programme planning of the Environmental Education Committee;
6. Convene training/orientation workshops for key communicator target groups;
7. Implement the Programme in the schools and communities and through the mass media using the key communicators oriented above and school and community centres etc;
8. Use the Galway's Soufriere and Plantation, Nature Trails and Fox's Bay Bird Sanctuary, as focuses for the education programme;

9. Facilitate the convening of a special environmental symposium for the public and media;
10. Design monitoring and evaluation tools (data sheets);
11. Monitor the compilation of the necessary data for the completion of the tools on an on-going basis;
12. Analyse the completed data sheets;
13. Convene a workshop at the end of the first year of the Programme to review and evaluate achievements based on the results of the data analysis and to plan year 2 of the programme.

DURATION:

3 Years

NATIONAL AGENCY:

This project will be best executed under the auspices of the National Trust in collaboration with the Ministry of Education, Health & Community Services and MATE

PROJECT NAME:

NGO Small Projects Fund

PROBLEM:

Most NGO projects are now being executed on a voluntary basis and the availability of funds is the major constraint on the efforts of NGO's to become more active in environmental management. The provision of a small scale assistance fund will therefore enable these organizations to increase their conservation and educational efforts.

OBJECTIVE:

To enable the Government to support small-scale environmental projects, particularly from the NGO Community.

DESCRIPTION:

This project will involve the design and establishment of a technical and financial assistance facility. Project activities will include:

1. Establishment of criteria for the utilization of the small scale assistance;
2. Determination of specific activities to be implemented.

DURATION:

3 Years

NATIONAL AGENCY:

Ministry of Education, Health and Community Services in Collaboration with MATE.

PROJECT NAME:

Waste Management Project

PROBLEM:

The generation and disposal of solid waste is approaching crisis with the potential for undesirable impacts on human health and the natural environment. Waste collection is irregular and landfill management is most unsatisfactory. Inadequate attention is paid to derelict vehicles, oily wastes, and hospital waste. There is an urgent need for the implementation of the draft Solid Waste Management Plan.

OBJECTIVE:

To reduce the threat to public health posed by poor waste management practices by implementing crucial components of the Solid Waste Management Plan.

DESCRIPTION:

Project activities will include:

1. The acquisition of White's Landfill site by Government, either through purchasing or long-term lease.
2. Conversion of White's Landfill into a Sanitary Landfill through infrastructure development and acquisition of equipment.
3. Acquisition of a fleet of collection vehicles with spare parts.
4. Implementation of a derelict vehicle programme.
5. Design and implementation of a waste oil collection and storage system.
6. Installation of an incinerator on the site of Glendon Hospital.
7. Development and implementation of programmes designed to promote alternate waste management practices including recycling, composting and waste reduction.

NATIONAL AGENCY:

The Environmental Health Division of the Ministry of Education, Health and Community Services.

