

Transforming to a Climate-Resilient and Low Carbon Economy – Montserrat's *Climate Change Policy* (DRAFT)



***Measures to adapt to climate change in accordance with Strategic
Objective 3 of the Sustainable Development Plan***

Ministry of Agriculture, Land, Housing and the Environment

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Transforming to a Climate-Resilient and Low Carbon Economy - Montserrat's *Climate Change Policy (DRAFT)*

I. BACKGROUND

This draft ***Climate Change Policy*** is the product of national consultations conducted from 2008 to 2011 funded by the United Kingdom Department for International Development (DFID) and managed by the Caribbean Community Climate Change Centre (CCCCC) under the three year regional *Enhancing Capacity for Adaptation to Climate Change in the Caribbean UK Overseas Territories* (ECACC) Project. As a cross-territorial project involving Anguilla, the British Virgin Islands, the Cayman Islands, Montserrat and the Turks and Caicos Islands, the ECACC project has provided funding for monitoring, conducting vulnerability and capacity assessments, developing adaptation strategies, and carrying out public education programs as it relates to climate change. The overarching goal of this project is to build local capacity in the planning and implementation of climate adaptation and mitigation measures, within the context of national development planning processes. A key outcome of this project is the development a ***Climate Change Policy*** for Montserrat.

This draft ***Climate Change Policy*** will be subject to public review and finalised during a final round of national consultations to be held in April 2011. It is hoped that this draft ***Climate Change Policy*** will generate informed discussion about viable options to transform Montserrat to a climate resilient and low carbon economy, which is a key pillar of national efforts to achieve sustainable development. This draft ***Climate Change Policy*** is complementary to and supportive of the Montserrat *Sustainable Development Plan* (SDP) which was approved in 2008. This draft ***Climate Change Policy***, which is supported by the technical and scientific analysis within the ECACC project vulnerability and capacity assessment, will be submitted to House of Assembly in May 2011 for consideration and approval.

II. CONTEXT

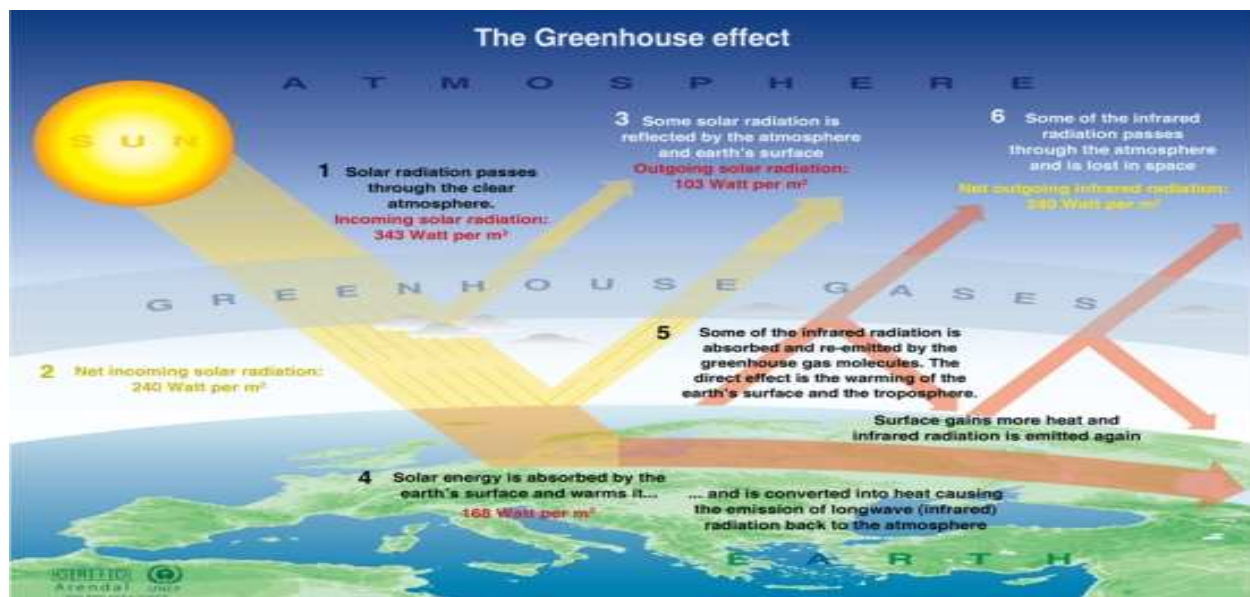
The Earth has warmed on average by 0.74°C over the last hundred years, with 0.4°C of this warming occurring since 1970. The past decade is the warmest on record since the beginning of instrumental climate records in 1850, according to data sources compiled by the World Meteorological Organization (WMO). Globally the rate of warming averaged over the last 50 years is nearly twice that for the last 100 years. The Intergovernmental Panel on Climate Change (IPCC) has determined that 90% of the warming effect can be attributed to human activities since the onset of the industrial revolution such as burning of fossil fuels for power generation, transport, industrial processes and housing. Global temperature increases are cause for concern worldwide. The IPCC, in periodic reports summarizing the extensive review of scientific literature, has determined that the impacts of this warming is already changing the world's

climate and causing an increase in extreme events (floods, droughts, storms), a progressive rise in sea level, and will result in an increase in hurricane intensity. The world's natural environment and biodiversity, together with human health and livelihoods, and the economies and sustainable development aspirations of most nations are affected by global climate change.

Intergovernmental Panel on Climate Change (IPCC)

The IPCC is an intergovernmental body open to all member Countries of the United Nations (UN) and the World Meteorological Organization (WMO) with a mandate to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. The IPCC is a scientific body. It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. It does not conduct any research nor does it monitor climate related data or parameters. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. Review is an essential part of the IPCC process, to ensure an objective and complete assessment of current information. IPCC aims to reflect a range of views and expertise. The Secretariat coordinates all the IPCC work and liaises with Governments.

Emissions of Greenhouse Gases (GHGs), which are the cause of global warming and associated climate change, continue to rise. Most developed countries and rapidly developing nations share the common view that global average temperatures should not rise more than 2°C above pre-industrial levels before 2100. Limiting warming to 2°C by 2100 will mean capping the current concentration of greenhouse gases of 430 ppm at 550 ppm, or reducing global emissions by 50% on 1990 levels by 2050. The cost of action to reduce GHG emissions and stabilize atmospheric concentrations to 500-550 ppm has been quantified by Sir Nicholas Stern in *The Economics of Climate Change* (2007) to be in the order of 1% of gross global GDP, with delayed action escalating damage costs to as much as 20% of global GDP taking into account the higher losses in most developing countries.



Sources: Okanagan university college in Canada, Department of geography, University of Oxford, school of geography, United States Environmental Protection Agency (EPA), Washington; Climate change 1996, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996.

While Caribbean countries contribute less than 0.1% to global greenhouse gas (GHG) emissions they will be amongst the earliest and worst adversely affected by climate change. Their small size relative isolation, concentration of communities and infrastructure in coastal areas, narrow economic base, dependence on natural resources, susceptibility to external shocks and limited financial, technical and institutional capacity are inherent vulnerabilities of small island developing states (SIDS). Exposure to current weather-related hazards and other climate variability compound these vulnerabilities which are often linked to inappropriate development paradigms. Changing weather patterns associated with climate change is expected to exacerbate the vulnerabilities and impacts currently experienced in the region. Heavier rainfall events are already challenging the capacity of some nations to cope, leading to more frequent flooding of settlements and infrastructure, and raising human health concerns. Longer dry spells are resulting in more frequent droughts affecting water resources needed for agriculture and human consumption. These weather extremes are likely to be accompanied by stronger hurricanes bringing the potential for increased damage and larger financial losses, greater pressure on national budgets and lengthier recovery times. Direct and indirect losses from weather-related events over the last three decades have cost the Caribbean between US\$700 million and US\$3.3 billion. In 2007 alone the region suffered US\$10 billion in economic losses representing over 13% of GDP⁶. With rising sea levels, higher storm surges associated with these events will exacerbate losses from coastal erosion and flooding that impact tourism activities and the wider national economy, temporarily disrupting port operations and food security as well as access along essential roads and isolating or displacing settlements and businesses. Sea-level rise further threatens freshwater aquifers from intrusion of salt water which could impact agricultural production and quality of drinking water.

III. WHAT MAKES MONTSERRAT VULNERABLE TO CLIMATE CHANGE?

Montserrat is vulnerable to natural hazards. In 1995 the Soufrière Hills Volcano erupted and has continued ever since. Sixty five percent of the housing stock and 90% of commercial buildings were destroyed in the initial eruption. The capital Plymouth, the airport and seaport were completely destroyed. Additionally, access was lost to 70% of the most productive agricultural land and farmers were forced to occupy less productive marginal land which has led to accelerated soil erosion and a significant increase in the level of food imports. Needless to say, the eruptions led to total collapse of the economy. Furthermore, all aspects of life were severely impacted, resulting in emigration of approximately 6,500 persons (62.5% of the population of 10,400). Moreover, the volcanic crisis has served to highlight Montserrat's vulnerability by increasing the island's remoteness and causing it to become dependent on foreign aid to cover capital and recurrent budgets.

Approximately 60% of the island is now considered to be unsafe for residence and for economic, social and other activities as a result of the active Soufrière Hills volcano. Therefore, there is increasing pressure for available lands to be used for agricultural, residential and commercial activities, and hence the critical need for effective planning, conservation and sustainable use of the limited available resources. The island was divided into 2 zones: (i) a Safe Zone in the north covering one-third of the island and accommodating all human settlements and associated

activities and (ii) an Exclusion Zone in the south covering the remaining two-thirds of the island and a Marine Exclusion Zone (Figure 1).



Figure 1: Safe Zone & Exclusion Zone of Montserrat

Montserrat's vulnerability to risks from natural disasters is compounded by climate change impacts. Changes of the magnitude projected by the Intergovernmental Panel on Climate Change (IPCC) for the current century will have significant impacts on Montserrat. Small Island Developing States like Montserrat share many of the human systems and physical processes of larger or continental developing states. However, vulnerability to global climate change is aggravated by common parameters shared by many small island developing States (SIDS) namely:

- Reliance on primary imports;
- Socio-economic extremes (small economy, with high dependence on external market forces – thus creating high sensitivity to external market shocks);
- Limited physical and social infrastructure;
- Ad hoc land use planning;
- Limitations in governance and public administration.

This renders places like Montserrat vulnerable to climate change. In addition, there are also inherent problems that impact on vulnerability. Montserrat is vulnerable to climate change because of:

1. **High exposure to natural hazards** (tropical cyclones, storm surge, drought, floods, tsunamis and volcanic eruptions);
2. **Limited physical size** (limited places for development & restricted adaptation options to climate change and sea-level rise);
3. **Economic remoteness** (measured by high freight and insurance costs);

4. **Limited natural resources and over-exploitation leading to degradation of natural systems** (coastal ecosystems which could otherwise act as natural sea defences and terrestrial ecosystems which lead to flooding and erosion);
5. **Lack of economic diversity** (livelihoods and development opportunities depend on natural resource base);
6. **Thin water lenses and decreasing fresh water availability** (high sensitivity to sea-level rise and changes in rainfall distribution);
7. **Import dependence and high sensitivity to external market shocks** (leading to low economic resilience);
8. **Inter-island migration** (leading to changes in social structure);
9. **Industrial activity and rapidly developing infrastructure** (in coastal areas – and on steep land); and
10. **Limited financial and human resources** (limited capacity to adapt to climate change impacts).

IV. POTENTIAL IMPACTS OF CLIMATE CHANGE ON MONTSERRAT

From regional studies that have been undertaken, the possible climate change effects and their general impacts on Caribbean Islands and consequently the island of Montserrat are:

Increase in sea surface and atmospheric temperature

- Coral bleaching and destruction of coral reefs;
- Biodiversity loss – temperature sensitive organisms (aquatic and land based)
- Warmer temperatures
- Increased air and water pollution
- Resurgence of vectors and vector borne diseases
- Risk of wildfires

Changes in rainfall frequency and intensity

- Droughts or floods
- Decreased fresh water availability
- Change in water levels due to the decline in rainfall.

Changes in storm activity

- More intense hurricanes and tropical storms
- Changes in storm paths
- Disruption/demolition of sanitation and sewage disposal systems as well as storm water drainage
- Loss of important coastline defences and coastal ecosystems – mangroves, sand dunes, coral reefs, sea grass beds

Sea level rise

- Saline intrusion into freshwater aquifers
- Coastal flooding and erosion
- Loss of coastal ecosystems (habitat, species, mangroves)
- Larger sea swells
- Increase in storm surge
- Damage to coastal communities and road networks

Different sectors would have differing vulnerabilities, which are a function of the nature of climate change, the sensitivity of the sector and its adaptive capacity. The table below shows the ranking of climate change impacts on key sectors.

Climate change issue areas	National significance (Social, Environmental, Economic, Cultural) 1. Four dimensions 2. Three dimensions 3. Two dimensions 4. One dimension 5. No dimensions	Certainty 1. Absolutely 2. Very Likely 3. Likely 4. Less Likely 5. Unlikely	Severity of threat/impact 1. Extreme 2. Very High 3. High 4. Low 5. Very Low	Urgency 1. Happening regularly 2. Happening now (once per season) 3. Happening <5yrs (immediate threat) 4. Happening 5-10yrs (short-term threat) 5. Happening 10-50yrs (long-term threat)	Sum
Agriculture Will affect nation's ability to feed itself. May be affected by water availability and development pressure. May lead to unemployment. May require significant adjustments such as use of new technologies.	1	1	1	1	4
Biodiversity In the long term, will affect all aspects of life (water supply, human health, settlements, tourism, agriculture, fisheries, coastal zone, etc.). Will affect ecosystem productivity and ultimate survival. Will ecosystems and species adapt quickly enough? Will new species colonise the area?	1	1	1	1	4

Beaches Significant socio-economic importance as recreation areas, are the first line of defence against stormy seas and can protect the marine environment from land-based sources of pollution. They are therefore important to the fishing and tourism industries. Also important as turtle nesting sites.	1	1	1	1	4
Fisheries Will affect nation's ability to feed itself, lead to loss of employment (direct & indirect). May require major adjustments.	1	1	1	1	4

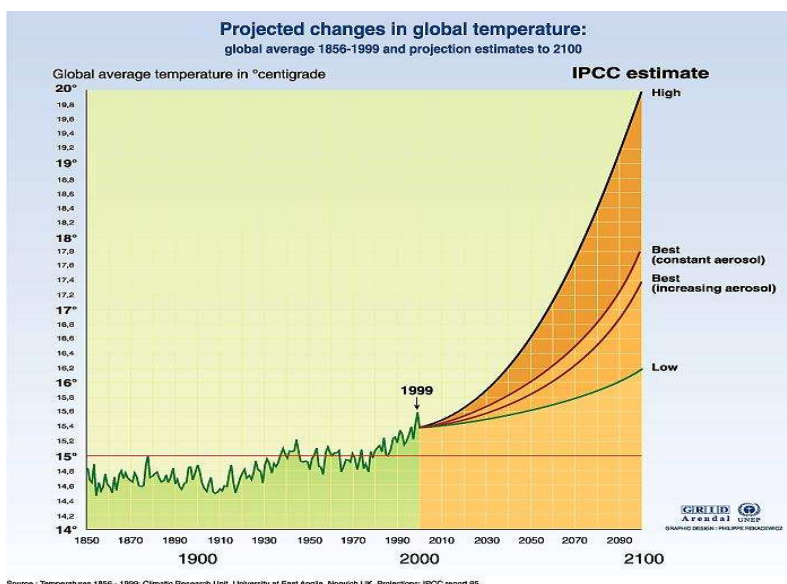
Tourism Tourism has been an important source of revenue (20 to 36% of GDP). It will be affected by biodiversity, water supply, human health, human settlements and the financial sector. Sustainable livelihoods would be at risk.	1	1	1	1	4
Coastal zone May impact fisheries, tourism, human settlements, water resources, livelihoods and critical facilities.	1	2	2 (Little Bay, Carr's Bay, Collins Ghaut, Old Road Bay, Woodlands, Rendezvous, critical infrastructure)	1 (Result of loss of turtle habitats & recreation)	6

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Access to critical infrastructure Access to seaport and airport may not be available during or immediately following severe storm events; this could be catastrophic if a volcanic eruption were to occur at these times when access to overseas medical facilities is critical.	1	2	2	1	6
Reefs (and other marine life) May impact fisheries, tourism, marine biodiversity and livelihoods.	1	2	2	2	7
Inland human settlements Due to steep topography, inland settlements will be impacted by severe soil erosion and increased wind velocity during storms due to high altitude.	1	2	2	3	8

Coastal human settlements Will be impacted by sea-level rise and increasingly intense storms and associated pronounced storm surge. Will be affected by water, human health, coastal zone processes and access to insurance. May lead to migration.	1	2	2	3	8
Water/ Hydrology Climate change may put Montserrat at risk to seasonal drought, variable water supply and diminishing water resources. Water problems will affect agriculture, health, tourism, human settlements and all other aspects of existence. Might require costly infrastructure such as reservoirs. Desalination may be a costly option.	1	3	3	2	9

Seagrass beds Important habitats for marine fish, turtle and conch	2	2	2	4	10
Damage to critical infrastructure These include seaports, airports, medical facilities, water sanitation and energy. These may have severe socio-economic repercussions.	1	2	2	5	10
Financial sector Hurricanes and surge damage will affect insurance/re-insurance. Sector will have a key role in funding the cost of rebuilding and adaptation measures.	2	2	2	4	10
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Coastal underground aquifers (not being used currently) Apart from potable water harnessed from springs, the only other potential source of potable water is situated in underground coastal aquifers. This 'water reserve' is likely to be inundated by sea water, which could have serious socio-economic implications.	2	2	3	4	11
Human health May be affected by increased magnitude and frequency of storms, extreme temperatures, flooding and drought. Will require strengthening of existing systems.	1	3	3	4	11

The UNDP *Human Development Report 2007/2008* considers warming of 2°C as the threshold above which dangerous climate change will occur such that irremediable effects on human development and irreversible ecological damage will become unavoidable. This threshold is expected to be particularly detrimental to small islands, coastal communities and the poor and vulnerable worldwide. The business-as-usual (BAU) scenario or current course of action could see global temperatures rise to 3°C to 4°C which will most surely spell disaster for many small islands,



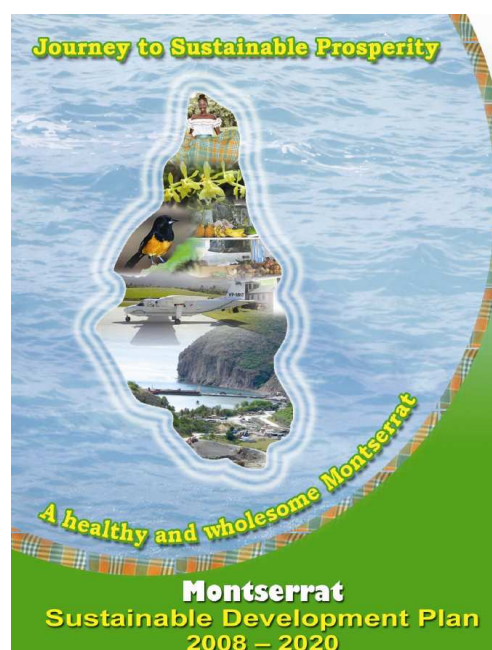
especially those like Montserrat fringed by temperature-sensitive coral reefs upon which their present tourism economies depend and future GDP growth relies, and which provide natural storm buffering to coastal communities from the ravages of the ocean. For this reason, SIDS worldwide and the CARICOM countries have rallied together to defend a global target of stabilizing atmospheric concentration of CO₂ at 350 ppm to limit temperature well below 1.5°C which is expected to avoid the worst impacts of 21st century climate change.

V. POLICY STATEMENT

Recognising that climate change presents an immediate threat to the re-development of Montserrat, this policy provides positive and systematic guidance by outlining key strategies and articulating measures needed to facilitate the transition to a climate resilient, energy efficient, low carbon development path that addresses risks from climate change impacts, reduces greenhouse gases (GHG) emissions in support of sustainable development.

VI. GUIDING PRINCIPLES

The transition to climate-resilient low carbon development is necessary to implement viable adaptation and mitigation measures in accordance with commitment under the *United Nation Framework Convention on Climate Change* (UNFCCC) and the *United Kingdom Climate Change Programme* and will contribute towards the achievement of the Territory's sustainable development aspirations as articulated in Montserrat's *Sustainable Development Plan* and *Medium-Term Strategy and Action Plan 2008 – 2012* which provide the framework for effective and timely implementation of this *Climate Change Policy*.



Montserrat Vision Statement

The vision agreed to and embraced by the people of Montserrat over the last ten years is:

“A healthy and wholesome Montserrat, founded upon a thriving modern economy with a friendly vibrant community in which all our people through enterprise and initiative can fulfill their hopes in a truly democratic and God-fearing society”

The *Sustainable Development Plan* (SDP) 2008-2020 for Montserrat was developed to provide the Government and people of Montserrat with an agreed and coherent policy framework over the twelve year period 2008-2020. The SDP is the overarching document which outlines national development priorities and provides the framework for public and private sector actions and resource allocation towards the development of the island. Montserrat's *Sustainable Development Plan* has been developed out of a consultative, consensus building process and outlines the vision of the residents of Montserrat, the agreed core values, the development strategies which will be followed in pursuit of the vision, as well as the action plan for the first five years of the long-term planning horizon. Under each ***Strategic Goal***, a number of strategies for accomplishment were formulated. Based on these strategies, a number of medium-term objectives were agreed. These medium-term objectives are designed such that their achievement over the period of 2008-2012 will contribute substantially towards the achievement of the related Strategic Goal. In order to ensure that there is clarity as to how each medium-term objective will be achieved, a number of strategic actions were determined. The underlying rationale for the identified actions is that when they are effectively executed, the cumulative effect would be the achievement of the particular medium-term objective by December 2012.



The *Medium-term Strategy and Action Plan* therefore sets out the:

- Medium-term objectives under each Strategic Goal;

- Strategic actions that will be implemented over the period 2008-2012 to ensure the achievement of each of the medium-term objectives;
- The agencies that will play a lead or supporting role in the implementation of the strategic actions;
- Strategic actions that will be given the highest priority attention over the period 2008-2012.

VII. POLICY GOALS AND OBJECTIVES

In accordance with the Territory's sustainable development aspirations as articulated in Montserrat's *Sustainable Development Plan* and *Medium-Term Strategy and Action Plan 2008 – 2012*, this policy will facilitate the transition to a climate resilient and low carbon economy by implementing measures that will:

1. Facilitate re-development in Montserrat, while addressing climate change risks and increasing energy demand/costs;
2. Educate key stake holders concerning climate change risk to coastal marine resources and to protect and enhance the reliance of these resources;
3. Conserve and protect national biodiversity and national heritage while enhancing the resilience of natural ecosystems to climate change impacts;
4. Enhance agricultural productivity, resilience and food security;
5. Address climate change impacts on health, wellbeing and quality of life while promoting sustainable development and sound economic growth;
6. Address climate change threats to the finance sector, insurance industry and property owners;
7. Educate key stakeholder and to conserve and ensure a sustainable supply of fresh water while addressing climate change risk/threats to resilience of water resources;
8. Achieve energy independence and the ability of Montserrat to meet its vital energy needs with reliable, affordable and renewable energy resources, through the pursuit of a balanced and advantageous transition toward control of our energy future, built upon a solid and ever growing foundation of our own free, abundant, clean, and renewable energy resources - (the wind and the sun);
9. Sustain viable communities that will ensure maintenance of livelihoods social wellbeing and the protection of social capital while enhancing the resilience of existing critical infrastructure to climate change impacts, and avoiding the construction of new infrastructure in areas or with materials prone to climate hazards;

10. Create a more competitive and environmentally responsible private sector by implementing “no regrets” measures that will protect the environment, promote low carbon energy efficient development while enhancing the resilience of natural ecosystems to climate change impacts.

VIII. APPLICATION

This policy shall guide the work of all governmental statutory, private sector, non-governmental and civic entities, supporting the transition to a climate resilient low carbon development path in Montserrat.

IX. POLICY DIRECTIVES

The following interventions will be implemented within 5 years of the adoption of this policy in order to facilitate the transition to a climate resilient and low carbon development path in Montserrat -

Agriculture and Food Security

Climate change will cause considerable impacts on Montserrat’s agricultural sector and food security including:

- ✓ Change in the incidence of crop pests.
- ✓ Decline in crop yields.
- ✓ Stress on livestock.
- ✓ Diminished water availability for irrigation.
- ✓ An increase to the already over dependence on imported food supplies.
- ✓ A scarcity of food crops and fish due to the adverse effects on sectors such as agriculture and fisheries.
- ✓ Imported food supplies could become more expensive with lowered availability.

In order to reduce dependence upon imported foods and enhance agricultural productivity, resilience and food security foods, while facilitating sustainable use and management of the environment and natural resources, long-term improvement in the state of environmental resources, and supporting hazard risk reduction and adaptation to climate change by the integration of environmental management and disaster mitigation strategies in development planning (Sustainable Development Plan - Strategic Objectives 1 and 3), the Government of Montserrat will over the next five years:

1. Develop and implement a sustainable agro-import substitution strategy and programme to ensure food security and economic diversification - Promote backyard gardening to

promote food security and reduce reliance on imported foods (**Medium-Term Strategic Objective**).

2. Integrate climate change considerations into development and implementation of comprehensive land use plans based on land capability, suitability and vulnerability (**Medium-Term Strategic Objective**) -
 - Zone land as a means of avoiding loss of inland agricultural land to development;
 - Utilize sheltered production systems (shade & green houses);
 - Promote alternative farming methods that are suitable for emerging climatic conditions (e.g. dry farming, drip irrigation & agro-forestry);
 - Develop monitoring and response systems for pests, disease and invasive species;
 - Utilize shade trees in pastures and encourage the use of live fences to provide fodder and lessen the impacts of hot weather;
 - Address climate change considerations in land leases under the *Registered Land Title Act*;
 - Develop and implement integrated pest management systems;
 - Employ soil and water conservation best practices including the use of hard and soft erosion control methods - Increase water storage capacity for harvesting water in the wet season.

Fisheries, Coastal and Marine Resources

Climate change will cause considerable impacts on Montserrat's coastal and marine resources including:

- ✓ Decrease in near shore fish stocks, due to loss of important nourishing systems like sea grass beds, mangroves and coral reefs.
- ✓ Decrease in deep water fish stocks as a result of changes in sea temperature.
- ✓ Destruction of coral reefs as a result of bleaching from higher sea surface temperatures.
- ✓ Changes in coastal topography and loss of sea grass bed and sand dunes.
- ✓ Increased coastal erosion, including the loss of beaches.
- ✓ Increased costs of sea defense mechanisms.
- ✓ Run off and pollution from land based sources as a result of a changing precipitation patterns.





In order to facilitate sustainable use and management of the environment and natural resources, long-term improvement in the state of environmental resources, and supporting hazard risk reduction and adaptation to climate change (Sustainable Development Plan - Strategic Objective 3) while addressing climate change risk to coastal marine resources and associated impacts on food security, the Government of Montserrat will over the next five years:

1. Implement appropriate fisheries technologies and systems to enable increased production of targeted import-substitution fishery products (Medium-Term Strategic Objective).
2. Provide climate proof basic fisheries infrastructure including storage facilities for fishermen, and safe harbour for fishing boats (Medium-Term Strategic Objective) - Climate proof boat landing facilities and on-land security for vessels and equipment during storms.
3. Integrate climate change issues into national fisheries policy and planning and update Fisheries Legislation to consider climate change considerations;
4. Strengthen fisherfolk organisations and their capacity to address climate change risks;
5. Develop and implement integrated coastal zone management - manage land based activities to reduce stress on coastal/marine ecosystems and integrate climate change consideration into physical development plans, use proper setbacks and EIA's for coastal development, control sand mining;
6. Monitor and identify areas susceptible to fish poisoning and discourage fishing in these areas;
7. Ensure proper treatment and management of sewage entering the marine environment from boats and land-based sources (outfall discharges to sea).

Tourism Sector

Climate change will cause considerable impacts on the tourism sector including:

- ✓ Direct damage to tourism plant and natural resource from sea level rise, increase in sea-surface temperatures, ocean acidification, storm surge and hurricanes.
- ✓ Increased inland flooding.
- ✓ Loss of attractiveness of Montserrat as a tourist destination.
- ✓ Increased insurance costs or no insurance coverage for properties in vulnerable areas.
- ✓ Buildings used as part of the tourism plant will become unsafe and lives will be threatened.
- ✓ Less water available for consumption and irrigation.
- ✓ Increased costs and environmental impacts of sea defense mechanisms and beach replenishment.
- ✓ Increased costs and reduced availability of insurance coverage for property.
- ✓ Change in tourism arrival patterns/numbers due to milder weather in areas where tourist populations reside impacting livelihoods, employment and the economy.



In order to facilitate the transition to sustainable tourism in Montserrat and the conservation and management of historical sites, artifacts and cultural heritage of Montserrat while addressing climate change risks and increasing energy demand and cost affecting the sector by improving integration into the regional and global tourism market and environment (Sustainable Development Plan - Strategic Objectives 1, 3 and 4), the government of Montserrat and the Tourism sector will over the next five years:

1. Develop and market the tourism product with the aim of laying the foundation for significant growth in high yield tourism (**Medium-Term Strategic Objective**) - Review the *Tourism Master Plan* to integrate climate change considerations and diversify the tourism product to include terrestrial nature tourism, heritage and volcano tourism and the employment of market-based incentives to promote a low-carbon climate resilient tourism industry (**Medium-Term Strategic Objective**) -
 - Establish policies, incentives and institutional arrangements to facilitate low carbon climate resilient tourism development;
 - Encourage developers of new accommodation and other tourism facilities to use low carbon and climate resilient measures during construction and operation of such facilities;

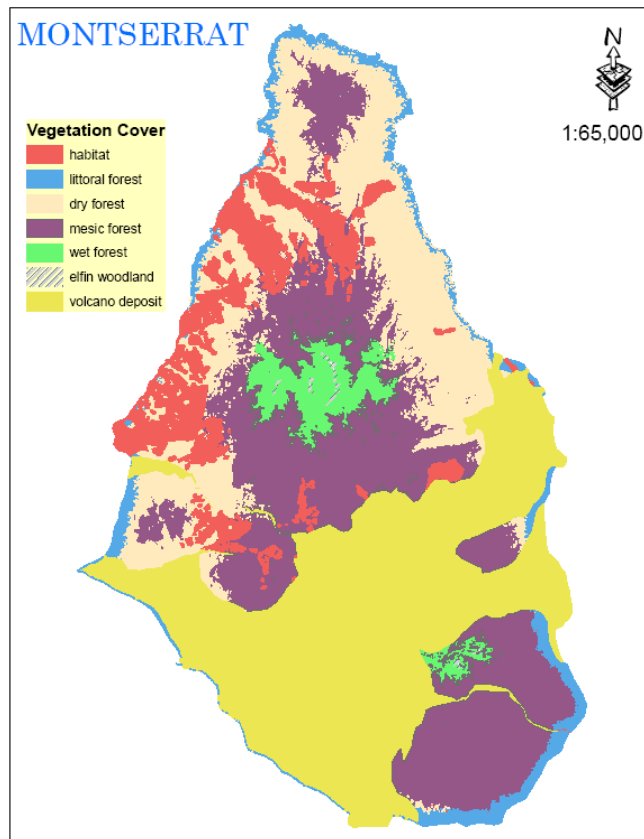
- Promote the retrofit of current tourism accommodation with low carbon climate resilient equipment (fixtures, solar panels, etc.);
 - Ensure that the tourism industry adheres to the building code and development control setbacks that address climate change risks;
 - Promote a sustainable tourism product through effective coastal conservation by protecting beach flora, utilizing hard and soft engineering for coastal protection and constructing artificial barriers, and regulating sand mining;
 - Climate proof new tourism development;
 - Promote a more sustainable climate resilient tourism product through recycling and reuse of water, water conservation and rain water harvesting;
 - Promote regional/local tourism to counter expected reduction in the number of extra-regional visitors due to climate change impacts and increases in cost of air travel and carbon footprint associated with such travel.
2. Identify, maintain and protect heritage sites and artifacts (**Medium-Term Strategic Objective**) and develop and implement national heritage site management plans (**Medium-Term Strategic Objective**) -
- Develop an inventory and assess vulnerability of cultural and historic sites, develop management plan to address climate change risks to such sites and climate proof vulnerable sites.

Terrestrial Resources and Biodiversity

Climate change will cause considerable impacts on Montserrat's terrestrial resources and biodiversity including:

- ✓ Impact on endemic species which are likely to become threatened or extinct.
- ✓ Threatened and endangered species could be under greater threat.
- ✓ Increase stress on and loss of soil and vegetation due to hurricanes flood and drought.
- ✓ Increase occurrence of invasive and pest species.
- ✓ Higher rates of bacterial and fungal growth is likely to hasten erosion.





In order to facilitate sustainable use and management of the environment and natural resources, long-term improvement in the state of environmental resources, and supporting hazard risk reduction and adaptation to climate change while addressing climate change risks to national biodiversity and national heritage and enhancing the resilience of natural ecosystems to climate change impacts (Sustainable Development Plan - Strategic Objective 3), the Government of Montserrat will over the next five years:

1. Create, enact and enforce policy and legislation to ensure effective environmental, climate change and disaster management, education, and participation in decision making (Medium-Term Strategic Objective) –
 - Monitor and evaluate status of hydro-geological conditions (Medium-Term Strategic Objective) and develop coordinating mechanisms to ensure that watershed management plans are implemented at both the public and private sector levels; use soil and water conservation methods to limit flash flooding and soil erosion ((Medium-Term Strategic Objective);
 - Develop efficient and effective governance structures for environmental, climate change management and disaster mitigation by enacting and enforcing the *Conservation and Environmental Management Act* (CEMA) (Medium-Term Strategic Objective) and concluding service level agreements between agencies responsible for managing watersheds.

2. Monitor and evaluate status of biodiversity (**Medium-Term Strategic Objective**), protect and conserve biodiversity and other natural resources (**Medium-Term Strategic Objective**), and develop and implement species and habitat action plans (**Medium-Term Strategic Objective**) –
 - review and revise the current national system of protected areas (terrestrial and marine) and climate proof the management plans for protected areas;
 - undertake vulnerability assessments of key ecosystems (forests, corals, watersheds, ghauts) and development management plans to address risks from climate change;
 - develop and implement species action plans for vulnerable species that are at risk from climate change (Mountain chicken, Bat, orchid, oriel, pribby);
 - assess quality of coral reefs and evaluate risks from climate change and other stressors and develop management plans to protect and/or reestablish vulnerable coral reefs.
3. Monitor and reduce the threat of invasive species (**Medium-Term Strategic Objective**) –
 - Aggressively manage invasive species in order to enhance resilience to climate change impacts.

Human Health, Wellbeing, Quality of Life and Economic Growth

Climate change will cause considerable impacts on Human Health, Wellbeing, Quality of Life and Economic growth for Montserrat including:

- ✓ Loss of revenue due to climate change impacts on the country's productive sector (Tourism, Fishing, Agriculture);
- ✓ Increase operational and capital cost associated with increase instance of extreme events (floods, droughts) increase in hurricane intensity and changing weather patterns, and associated impact on Gross Domestic Product, attractiveness for investment, and increased stress on the national budget;
- ✓ Increase in poverty and inability to provide for basic needs;
- ✓ Increase in illness especially those due to airborne pollutants such as asthma and other respiratory diseases;
- ✓ Contaminated water supplies;
- ✓ Increased demand placed on current levels of medical services, facilities and infrastructure;
- ✓ Insurgence or resurgence in diseases such as cholera, dysentery, malaria, dengue, and other strains not common to Montserrat - thus creating a need for specialised treatment to be administered;
- ✓ Thermal stress particularly for outdoor workers;
- ✓ Water borne diseases from eating fish and engaging in recreational activities in a warmer sea;
- ✓ Increased atmospheric temperature likely to cause heat stress and respiratory issues;
- ✓ Increase in sea surface temperature causes an increase in food poisoning (ciguatera);
- ✓ Montserrat wellbeing impacted as measured by job security, employment, social stability, social capital and poverty levels;
- ✓ Climate related migration issues;
- ✓ Loss of livelihoods;

- ✓ Loss of lives.

In order to address climate change impacts on health, wellbeing and quality of life while enhancing human development and the well-being of vulnerable populations and improving the quality of life of all people, promoting prudent economic management, sustained growth, a diversified economy and the generation of employment opportunities while facilitating legislative, policy and regulatory framework for investment and business activities, as well as appropriate facilities for the effective delivery of services to the various customers (Sustainable Development Plan - Strategic Objectives 1, 2 and 3), the Government of Montserrat will over the next five years:

1. Develop and implement policies and programmes to enhance the well-being of the population while reducing risks to climate change impacts with emphasis on the vulnerable population (**Medium-Term Strategic Objective**) -
 - establish health financing, medical and disability policy to address climate change impacts on human health (**Medium-Term Strategic Objective**);
 - revise and implement the nutrition policy and plan to address impacts from climate change on dietary intake, food security and food imports (**Medium-Term Strategic Objective**).
2. Conduct a comprehensive assessment of infrastructural needs for Glendon Hospital to address climate change vulnerability and impacts on health service delivery (**Medium-Term Strategic Objective**) -
 - ensure health service delivery can address anticipated impacts from climate change;
 - assess vulnerability and climate proof access to and services of hospitals and clinics;
 - integrate climate change considerations into hospital and building design and landscaping.
3. Develop and promote environmental health programmes to reduce health hazards (**Medium-Term Strategic Objective**), undertake a comprehensive health sector analysis and produce a strategic sector plan that addresses climate change risks to health service delivery (**Medium-Term Strategic Objective**) -
 - expand the public awareness and preventative health care programs to incorporate climate change risk;
 - enhance health insurance to address health issues associated with climate change – include treatment for climate change health impacts in the establishment of a National Health Insurance Scheme;
 - implement vector control programme (**Medium-Term Strategic Objective**);
 - ensure stakeholder training & empowerment regarding likely health issues associated with climate change;
 - address emotional stress from climate change through financing for effective community disaster and climate change risk preparedness and training;
 - implement surveillance of fish poisoning and improve reporting on fish poisoning to address anticipated increase in incidents of fish poisoning from climate change;
 - undertake adequate water quality monitoring.

4. Undertake evaluation of liquid and solid waste management in Montserrat and develop a waste management plan (**Medium-Term Strategic Objective**) and sewage master plan (**Medium-Term Strategic Objective**) -
 - Build and maintain climate-resilient sanitation, sewage and solid waste and disposal systems – evaluate climate vulnerability of existing and proposed systems and climate proof vulnerable systems.
5. Strengthen government financial and economic planning and management systems to improve efficiency and reduce risks from climate change (**Medium-Term Strategic Objective**) –
 - assess vulnerability of emergency shelters;
 - climate change and disaster mitigation strategies incorporated in development policies, plans and projects (**Medium-Term Strategic Objective**) and within the 5 year review of the *Sustainable Development Plan*;
 - Develop efficient and effective governance structures for environmental management and disaster mitigation by enacting and enforcing the *Conservation and Environmental Management Act* (CEMA) (**Medium-Term Strategic Objective**) to reduce levels of pollution that affect human health and wellbeing and enhance the resilience of natural systems to climate change impacts;
 - Formally incorporate climate change risk into the national budgeting processes;
 - Complete a cost benefit analysis of cost of inaction an action for climate change risk impact and present this annually in the budget and represent this information to rationalize investments in social capital/social safety net, public health and wellbeing;
 - Implement appropriate urban integrated pest management systems to enhance the resilience of natural systems to climate change impacts.

Finance and Insurance Sector

Climate change will cause considerable impacts on Montserrat's finance and insurance sector including:

- ✓ Increase insurance and mortgage cost to cover risk.
- ✓ Inability of home owner to access financing for home.



In order to address Climate Change threats to the finance sector, insurance industry and property owners while promoting prudent economic management, sustained growth, a diversified economy, the generation of employment opportunities and effective social protection (Sustainable Development Plan - Strategic Objectives 1 and 2), the Government of Montserrat will over the next five years:

1. Establish public /private partnerships for the provision and financing of climate proof affordable housing solutions (**Medium-Term Strategic Objective**) -
 - Legislate the requirements that climate change risk assessment and management be a precondition for any development or construction permits, loans or mortgages;
 - Establish and legislate climate change risks management protocols for the finance sector;
 - Provide home improvement grants to vulnerable households living in sub-standard conditions (**Medium-Term Strategic Objective**) - Collaborate with the insurance and financial services sector to establish economic incentives for owners to climate proof existing and new buildings;
2. Provide social housing solutions for vulnerable households (**Medium-Term Strategic Objective**) –
 - develop national climate change insurance schemes for health and catastrophic loss;
 - evaluate options for regional pooling of climate change risk (e.g. through Overseas Territories access to CRIF);
 - formulate appropriate economic incentives - offer deductions or lower premiums on insurance for climate proofing buildings and for building climate resilient infrastructure;
 - collaborate with banks/insurers to develop incentive program through home loans, and develop climate change risks screening tools for banks and insurers.
3. Develop and construct climate proof physical infrastructure required to facilitate sound economic development (**Medium-Term Strategic Objective**) -
 - Update and legislate the Building Codes to address climate change risks.
4. Climate proof the development of Little Bay and facilities for the effective delivery of Government services (**Medium-Term Strategic Objective**) -
 - Identify Government assets located in climate change risk-prone areas, and undertake measures to reduce the vulnerability of such assets.

Water Resources

Climate change will cause considerable impacts on Montserrat's water resources including:

- ✓ Decreased fresh water availability.
- ✓ Increased salinity in fresh water supply.
- ✓ Contamination of fresh water supplies by flooded or malfunctioning sewerage systems.
- ✓ Increase cost for water.

In order to build a healthy population and address inadequacies in the existing regulatory framework (Sustainable Development Plan - Strategic Objectives 2 and 3) while addressing climate change risk/threats to resilience of water resources, the Government of Montserrat will over the next five years:

1. Create, enact and enforce policy and legislation to ensure effective environmental, climate change and disaster management, education, and participation in decision making (Medium-Term Strategic Objective) and identify/protect and sustainably utilize water resources (Medium-Term Strategic Objective) -
 - Develop a Water Strategy - Undertake an inventory of underground and surface water resources, and an assessment of water use and demand by sector in order to determine the water balance; review the water policy to ensure that climate change issues are addressed including through increased rain water capture and storage, water conservation and water recycling and reuse; establish and promote an education and awareness programme on water conservation; promote the installation of water conservation devices in large water users; ensure that Water Reservoir is repaired; encourage the use of grey water for gardening and irrigation, etc.;
 - Strengthen the institutional capacity of the water regulatory agency within the MICUH, including the provision of innovative financing to support work of the agency;
 - Establish by legislation measures to conserve and monitor water in large commercial users;
 - Revise the building codes to stipulate the minimum cistern/tank size for rain water harvesting and storage as determined by the size of house and or family;
 - Limit the number of golf courses to be constructed;
 - Pass and enforce the *Conservation and Environmental Management Act* (CEMA) (Medium-Term Strategic Objective) to address water contamination issues to enhance the resilience of water resources;
 - Promote the use of renewable energy sources to produce and reduce the cost of water.

Energy Security

Climate change will cause considerable impacts on Montserrat's energy security including:

- ✓ Increased energy costs;
- ✓ Disruption of fuel supplies as a result of storm events and closure of ports;
- ✓ Disruption of energy supplies during an extreme weather event (hurricane etc.);
- ✓ An increase in demand for energy to keep homes and businesses cool and satisfy increasing water demand;
- ✓ The continued and growing demand for fossil fuels increase the likelihood of marine and terrestrial spillage and pollution.



In order to diversify the country's energy supply by harnessing geothermal and wind energy for domestic consumption, export to OECS neighbors as well as the attraction of high value-added energy-intensive business enterprises (Sustainable Development Plan - Strategic Objective 1) while addressing threats to energy infrastructure and supply from climate change, the government of Montserrat over the next five years will:

1. Assess and develop feasible sources of renewable energy (Medium-Term Strategic Objective).
2. Develop the capacity of MUL to provide a reliable and climate proof supply of affordable electricity utilizing renewable sources of energy where feasible (Medium-Term Strategic Objective):
 - Enhance the resilience of the electricity generation and distribution system to make sure they are climate proof;
 - Evaluate viable options for the relocation of fuel storage systems from areas vulnerable to sea level rise and storm surge (e.g. Carr's Bay fuel terminal);
 - Ensure that existing and new facilities are "climate proof" - relocate vulnerable utilities underground and locate all utilities in new developments underground (except in areas prone to flooding and storm surge);
 - Endorse and implement the *Energy Policy* to promote renewable energy and energy efficiency, reduce energy cost and encourage greater energy independence (Medium-Term Strategic Objective);
 - Update and adhere to comprehensive land use and physical development plans with zoning to establish appropriate setbacks for potential sites for wind generators.

3. Create legislation, regulations and incentives to encourage the generation, private use and licensing of suppliers of alternative sources of energy (wind, solar and geothermal), energy conservation and the sale of energy to MUL (**Medium-Term Strategic Objective**):
 - Encourage the use of energy-efficient appliances and lighting by providing fiscal incentives;
 - Launch campaigns for energy conservation as well as demand side management strategies;
 - Incorporate “green” design into buildings (e.g. natural cooling systems and designs that maximize natural lighting).

Vulnerable Communities and Critical Infrastructure



Climate change will cause considerable impacts on Montserrat's vulnerable communities and critical infrastructure including;

- ✓ Loss of houses, infrastructure, and other investment from extreme events (flooding, landslides) and hurricane activity.
- ✓ Flooding of low-lying areas from storm run-off and storm surge.
- ✓ Displacement of communities especially in low lying areas like Sandy Ground, East End and the Valley (Bottom) as well as those in coastal areas e.g. Island Harbour.
- ✓ A shift in port development and infrastructure as a result of sea level rise - this will include higher maintenance costs and increased dredging.
- ✓ Damage to electrical infrastructure.
- ✓ Damage to roads.
- ✓ Communications service damage and disruptions.
- ✓ Damage to schools and hospitals.
- ✓ Contamination of household water supply (cisterns).
- ✓ Damage to ports (Air and Sea).



*In order to promote a thriving and viable population, adequate housing, adequate and reliable international and local transport and telecommunication infrastructure (**Sustainable Development Plan - Strategic Goals 1 and 2**) while facilitating re-development and sustain viable communities while avoiding the construction of new infrastructure in areas or with materials prone to climate hazards, the government of Montserrat will in the next five years:*

1. Develop and construct climate proof physical infrastructure and transportation facilities required to facilitate tourism development, international trade and national well-being (**Medium-Term Strategic Objective**) –
 - Support research and the use climate-resilient designs suitable for Montserrat;
 - Enhance protection where retreat from vulnerable areas is impossible – use bioengineering where practical in place of hard engineering.
2. Develop a risk categorization scheme for government residential buildings and emergency shelters (**Medium-Term Strategic Objective**), establish and climate proof road and utilities network in the north of the island to facilitate enhanced road safety for pedestrians (**Medium-Term Strategic Objective**).
3. Climate proof the development of Little Bay and facilities for the effective delivery of Government services (**Medium-Term Strategic Objective**).
4. Adopt the OECS building code and modify to meet local requirements and climate change risks (**Medium-Term Strategic Objective**), establish minimum standards for acceptable climate proof housing (**Medium-Term Strategic Objective**), develop and adopt a legal

framework for the development of the housing sector (**Medium-Term Strategic Objective**) and provide permanent climate proof housing solutions for the vulnerable (**Medium-Term Strategic Objective**) –

- Revise the Building Code to incorporate climate change risks;
- Replace all emergency shelters with permanent climate proofed housing (**Medium-Term Strategic Objective**);
- Develop and implement policies/guidelines for clearing lots for house construction that consider climate change considerations.

5. Review and update the physical development plan to address risks from climate change and natural disasters (**Medium-Term Strategic Objective**), improve the management of the project cycle, minimizing wastage and cost overruns, and the maximization of value derived from money expended while facilitating the provision of adequate utilities and sewerage infrastructure, as well as the provision of appropriate facilities for the accommodation of Government entities for effective service delivery (**Sustainable Development Plan - Strategic Goal 1**) by:

- integrating climate change considerations into land use plan, new building code, standards and regulations for infrastructure in vulnerable areas;
- undertaking vulnerability mapping and employing a retreat approach to planning and development in high hazard areas;
- locating all utilities in new developments underground;
- integrating climate change issues into infrastructural development projects (seaport, Little Bay, etc.);
- discouraging development along steep sides of ghauts or in landslide and flood-prone areas;
- climate proof existing infrastructure - protect vulnerable physical capital (transportation, communication, water & sanitation & energy) from climate change impacts.

6. Design and implement a comprehensive environmental impact assessment (EIA) process (**Medium-Term Strategic Objective**) -

- strengthen environmental impacts assessment (EIA) legislation and procedures to ensure that climate change risks are considered during the project approval process, and are integrated into any environmental management plan (EMP).

7. Strengthen national and community level capacity for mitigation, management and coordinated response to natural and technological hazards, and the effects of climate change (**Medium-Term Strategic Objective**), enhance community resilience to mitigate and respond to the adverse effects of climate change and disasters (**Medium-Term Strategic Objective**), and improve the early warning system (**Medium-Term Strategic Objective**) -

- undertaking vulnerability mapping and develop community-based climate change and disaster response plans;
- upgrade early warning systems to include risks from climate change (**Medium-Term Strategic Objective**);
- incorporate climate change and disaster risk management into the key sectors of national economy (**Medium-Term Strategic Objective**);

- Construct appropriate multipurpose hurricane shelters (**Medium-Term Strategic Objective**).

X. ACCOUNTABILITY

Responsibility for the timely and coordinated implementation of this *Climate Change Policy* is vested with the *Climate Change Council* which will be established and chaired by the Minister for the Ministry of Agriculture Land Housing & Environment (**Medium-Term Strategic Objective**). The *Climate Change Council* shall have representations from the Governor's Office, all government ministries, Members of the Opposition, non-government organizations, Statutory Authorities, civil society, the private sector, academia, the National Youth Council and Utilities. The *Climate Change Council* shall establish Technical Subcommittees to support and assist the work of the Council. The Council shall ensure that measures are undertaken to ensure that this Policy is integrated into the Medium Term Economic Framework (MTEF) and the implementation of the Sustainable Development Plan (SDP). The Council shall ensure that the policy is broadly circulated for public information and action.

The following departments and agencies shall provide technical and administrative support to assist the work of the Council:

- Department of Environment (DoE);
- Disaster Management Coordinating Agency (DMCA);
- Ministry of Communication and Works (Energy);
- Physical Planning Unit (PPU);
- Department of Development Planning and Policy.

The Government of Montserrat shall undertake a comprehensive institutional capacity assessment of, and devise a capacity strengthening programme for the main environmental management and disaster mitigation agencies in order to identify, recruit and train staff of these agencies and secure adequate facilities and equip the Department of Environment and the DMCA to implement priority climate change projects and programmes outlined in this *Climate Change Policy* (**Medium-Term Strategic Objective**).

XI. FINANCING

New and additional financing is required to implement those actions outlined in this *Climate Change Policy* that are needed to facilitate the transition to a climate resilient low carbon development path in Montserrat (**Sustainable Development Plan Strategic Objective 3**).

In order to finance measures required to implement this Policy, the Government of Montserrat will:

- (a) negotiate with funding agencies to secure the development assistance required to implement priority climate change projects and programmes outlined in this *Climate Change Policy* (**Medium-Term Strategic Objective**);
- (b) secure adequate facilities and equip the Department of Environment and the DMCA to implement priority climate change projects and programmes outlined in this *Climate Change Policy* (**Medium-Term Strategic Objective**);
- (c) allocate a certain percentage of costs associated with new projects to be allocated for climate resilient and low carbon proofing, and such costs will be charged against ongoing project costs.

XII. MONITORING

The implementation of this *Climate Change Policy* shall be monitored by the *Climate Change Council* or its successor body. Government shall review the Mandate, Terms of Reference and composition of this entity with a view to better equipping it to fulfill its mandate.

The Council shall report to the House of Assembly through the Minister for the Ministry of Agriculture Land Housing & Environment on a semi-annual basis, as well as at any other time deemed necessary. The Climate Change Council shall keep this policy under regular review, and shall monitor implementation of the directives of this policy.

The *Climate Change Council* shall present to House of Assembly an annual report on measures that have been undertaken to implement this policy. This report is to be tabled in the House of Assembly.

Beginning no later than the fifth anniversary of the date of this policy, the *Climate Change Council* shall conduct a public review of this policy to determine its effectiveness in achieving its goals and objectives, and update the policy based on the findings of the review and best practices at the time. The report of this review is to be presented to the Cabinet within one year of the beginning of the review.