

Mr. Chairman, Ladies and Gentlemen, Good Morning.

## **Introduction**

First of all, let me welcome you to Saint Lucia and express the pleasure and the honour that our Ministry attaches to the hosting of such an important meeting. The issue of Global Environmental Change and its impact on Food Systems is one that is of profound importance to a Ministry that is charged with the mandate of catalyzing, managing and supervising the development of the Agriculture, Forestry and Fisheries sectors in a tropical, small island developing state. Therefore, our interest in this meeting is more than a passing one, and the level of that interest can perhaps best be understood as the difference between bacon and eggs. However, to fully understand this analogy you will have to wait for the end of my address.

Mr. Chairman, much has been written on the issue of Global Environmental Change, and I must commend GECAFS for the significant work that it has already done on this issue. It is important for us to note, however, that while Global Environmental Change encompasses Global Warming, it does not relate solely to Global Warming. Similarly, when we examine food systems, which have as their main responsibility the timely provision of an adequate and safe supply of quality food to meet the needs of the population, we realize that although GEC is one factor that may impact on a food system, it is by no means the only one. Consequently, any programme that seeks to investigate the relationship between GEC and FS must take cognizance of the myriad other factors that will influence this relationship.

## **Food Systems**

The issue of Food Systems is one with which we, as a Ministry of Agriculture, Forestry and Fisheries, are very familiar. The Mission Statement of our Ministry is “To develop the agricultural sector to ensure increased production of quality food and other commodities through environmentally sustainable management practices, for the benefit of the entire population”. In that statement we recognize the nexus between our food production systems and the environment, and the need to ensure that the food system is environmentally sustainable. Unfortunately, we do not always practice what we preach, and perhaps the greatest paradox can be found in the fact that the sector which relies so heavily on the integrity of our natural resources to produce an output is also the one that poses one of the more serious threats to these resources and the environment.

It is impossible to speak of agriculture and food in St. Lucia and not make mention of the banana industry. This industry for over two decades almost single-handedly underpinned the national economy and provided the substrate on which rural communities fed, were nourished and thrived. However, the advent of globalization and trade liberalization has ushered in new realities with which both the banana industry and the national economy have had difficulty addressing. And these realities are extremely pertinent to today's meeting.

The erosion of the preferential market for Windward Island bananas in the UK has resulted directly in a loss of foreign exchange earnings for these islands. In the case of St. Lucia, revenue from the industry has declined from an amount of \$184.8 Million in 1992 to \$43.17 Million in 2001. For the Windward Islands as a whole, the figure is equally dramatic - \$376.20 Million in 1992 to \$102.52 M in 2001. While this has implications for the entire economy, it impacts significantly on the food security status of the country, given our high dependence on imported food, which is derived mainly from extra-regional sources. Trade Liberalization has also made our markets more porous to cheap food imports, thereby making it even more difficult for our domestic food systems to compete. To get a vivid demonstration of the impact on a national economy of a decline in the foreign exchange earnings from a traditional export crop one has to look no further than our sister island of Dominica.

Even without trade liberalization, however, our food systems are under threat. The very commodity that has catalyzed the development of rural communities and the growth of national economies has eroded the base on which it has grown. In order to increase the production of bananas to meet the demands of the external market, we have cleared forested areas, planted on steep slopes, cultivated in or near watersheds, contributed to pesticide runoff into our water courses, and overworked lands to the extent that the nutrient status of these lands is lower than what it was a decade ago.

If we now superimpose on the previously mentioned factors the issue of global environmental change and the profound impact that it can have on our food systems, then we begin to understand the enormity of the situation.

In 1994, St. Lucia's banana production dropped by 30,000 tonnes, the result of a one-in-100 year water event known as Tropical Storm Debbie. Last year, our banana production dropped by 36,000 tonnes to its lowest value in 22 years, the result of our worst drought in 40 years. Therefore, in the short space of 8 years we have experienced extreme weather phenomena that have had dramatic impacts on our food systems. Coincidence or a trend? Or to use the vernacular of the subject: Greenhouse Signal or the Background Noise of natural climate variability?

### **Global Environmental Change – Is there a Problem?**

The question for us to answer therefore is “Is there really a problem; is Global Environmental Change really an issue?” And it is only when we have convinced the policy makers that there really is a problem that we will see concerted and decisive action on this issue. To illustrate this point, let me crave your indulgence as I read to you the transcript of a 2000 Presidential Debate, and to protect the innocent, I will not reveal the names of the participants.

**Moderator:** What about global warming?

**Candidate 1:** I think it's an issue that we need to take very seriously. But I don't think we know the solution to global warming yet, and I don't think we've got all the facts before we make decisions [*sic*]. I'll tell you one thing I'm not going to do is I'm not going to let the United States carry the burden for cleaning up the world's air, like the Kyoto treaty would have done. China and India were exempted from that treaty. I think we need to be more even-handed as, evidently, ninety-nine senators - I think it was ninety-nine senators-supported that position.

**Moderator:** Global warming, global warming. The Senate did turn it down.

**Candidate 1:** Ninety-nine to nothing.

**Candidate 2:** I think that - well, that vote wasn't exactly - a lot of supporters of the Kyoto treaty actually ended up voting for that because of the way it was worded, but there's no doubt there's a lot of opposition to it in the Senate.

...But I disagree that we don't know the cause of global warming. I think we do. It's pollution, carbon dioxide and other chemicals that are even more potent but in smaller quantities that cause this. Look, the world's temperature's going up, weather patterns are changing, storms are getting more violent and unpredictable. And what are we going to tell our children? And I'm a grandfather now. I want to be able to tell my grandson when I'm in my later years that I didn't turn away from the evidence that showed that we were doing serious harm. In my faith's tradition, it's written in the Book of Matthew: "Where your heart is, there is your treasure also". And I believe that we ought to recognize the value to our children and grandchildren of taking steps that preserve the environment in a way that's good for them.

**Candidate 1:** Yeah, I agree. I just think there's been some of the scientists, I believe, Mr. Vice President, haven't they been changing their opinion a little bit on global warming? A profound scientist recently made a different...

An exchange on rules of engagement followed, because apparently one of the rules was that the candidates were not allowed to direct questions at each other. The discussion on global warming concluded with the following statement from Candidate 1.

**Candidate 1:** What the heck. I - of course there's a lot of - I mean, look, global warming needs to be taken very seriously, and I take it seriously. But science - there's a lot of - there's differing opinions, and

before we react, I think it's best to have the full accounting, full understanding of what's taking place...

You can tell from that exchange, I assume, that discussions on global warming and environmental change among the most senior policy makers are not always the most coherent or enlightened. That should put your job of convincing policy makers into some sort of perspective.

### **Empirical Data**

What then are the data on environmental change?

Measurement records indicate a warming of 0.3 to 0.6°C in global average temperature since 1860. The year 2001 was the 23<sup>rd</sup> consecutive year that the global mean temperature was above the 1961-1990 average, it was the second hottest in the historical record, and 9 of the 10 warmest years since 1860 have occurred since 1990. The hottest year ever was 1998, followed by 2001, 1997, 1995 and 1990. Since 1976, global temperatures have risen three times faster than the warming that occurred over the 20<sup>th</sup> Century as a whole.

Mean sea level has risen by 10 to 25 cm and mountain glaciers have retreated. Models predict that sea levels will rise another 15 to 95 cm by the year 2100, which is two to five times faster than the rise experienced over the past 100 years. A sea level rise of 100 cm will cause Egypt to lose 1% of its land, the Netherlands 6%, and Bangladesh 17.5%. It is little wonder that the Government of Tuvalu, situated in the Pacific, and predicted as one of the first countries to disappear from rising sea levels, is considering taking legal action against the industrialized nations of the world for their contribution to global warming.

### **The Likely Impacts on the Caribbean**

If we are to accept, then, that GEC is indeed a reality, what can we expect to happen in the Caribbean as a result of these changes?

To answer that question, let us first look quickly at the features of our Caribbean nations.

- To begin with the obvious – they are all, with the exception of Guyana, island nations. However, ironically, Guyana is perhaps currently the one most threatened by inundation.
- Most of the populations are concentrated in the coastal areas, as are the major economic activities, with tourism being the most important of these.
- All of the islands are vulnerable to one form or the other of natural phenomena or hazard, including hurricanes, droughts, and volcanic activity.

- Almost all of the economies are stressed, thereby constraining the capacity of the national Governments to respond to emergency or disaster situations.
- The natural resources of all of the islands, some obviously more so than others, are under severe strain from human activity, such as agriculture, human settlements, tourism and industry.

Trotz, Trotman and Narayan, in their article “Climate Change Impacts on Agriculture, Water Resources and Coastal Environments in the Caribbean” (Land and Water Resources in the Caribbean, CARDI 2001, Paul. C and Opadeyi J., ed.), provide an excellent summary of the likely impacts on the essential elements of our food systems. While I know that most of you would be aware of the specifics of this study, I will quickly point out some of its projections.

On the issue of Mangroves, which are so important for our coastal fishery and for their sediment trapping and erosion protecting characteristics, it is noted that they can be adversely affected if the sedimentation rate exceeds the rate of sea level rise. If this occurs, a sequence of events may be unleashed, including mangrove zone migration inland and seaward margin erosion. Additionally, sea level rise will increase the salinity in mangrove swamps, and may also result in death of the mangroves. Sea levels are not the only factor that can impact on mangroves. Elevated water temperatures, excessive precipitation, decreased rainfall or increased evaporation can all affect the integrity of mangroves.

Coral reefs are also sensitive to climate change. A variety of factors such as higher temperatures, reduced salinity, and sedimentation can cause bleaching and death of corals.

An increase in sea levels will cause flooding in low-lying areas, and here in St. Lucia this is an area of concern for the fishing village of Dennery, which just a few weeks ago suffered the effects of storm surges associated with the passage of Tropical Storm Lili, prompting the Prime Minister to call on his Physical Development Ministry to engage in discussions with the relevant agencies to develop a long-term solution to this problem. Most of our hotel plant is situated on the coastline, and the hotel infrastructure will be among the first to suffer. Also, saline intrusion into agricultural lands will impact on the productivity of these lands. Studies demonstrate that saline water can intrude many kilometers inland, and in islands such as ours where over half the population resides within two kilometers of the coast and most of our economic activity is concentrated within this narrow confine, the results should be obvious.

Agriculture will be affected in myriad ways by environmental change. Higher temperatures will affect the rate of metabolic processes in plants, although there is some debate over whether the differences between plants utilizing C3 and C4 pathways will be as marked as some believe. There may be changes in evapotranspiration and consequently in soil water content, which may present as water deficit conditions for plants. There may also develop salinity problems in soils if drainage systems are not

adequate or irrigation systems sub-optimal. And, elevated temperatures may present problems for livestock, through an increase incidence of disease. Moreover, the profiles of insects and disease pathogens should be expected to change with environmental change, posing additional challenges for food systems.

All of these will cause changes in the economic, social, environmental and political landscapes of our Caribbean islands, for which we must prepare and devise strategies to mitigate the problems, where possible, and adapt to the changes, where inevitable.

### **What Can We Do?**

What then can and should we do to ensure that our food systems are able to cope with the challenges brought on by global environmental change?

We have two options. The first set of options is perhaps best summarized in a section on “How to Survive Global Warming”, taken out of a book called *Stupid White Men* by Michael Moore (HarperCollins, 2001). Mr. Moore suggests the following six actions:

1. Identify common household objects that could serve as flotation devices once the ice caps melt. Give special attention to items made of synthetic materials, which tend to be extremely waterproof.
2. Don't forget to look outside, too – these water-proof chairs with built-in cup holders will float just as well in the ocean as in your backyard pool.
3. Examine topographical maps of your area to determine the highest elevation; map out the quickest route there. Hold escape drills.
4. Invest in Ziploc bags and those yellow waterproof cameras.
5. Contact your local YMCA about swimming lessons. Take lessons. *Now*. Pay special attention to instructions for treading water.
6. Change your vacation plans from Florida to Montana.

Or, we can take some sensible measures, and in outlining some of these, I will highlight the initiatives that are currently in train in our Ministry that lend support.

We can implement proper land use planning policies, that clearly define the agro-ecological zones within which certain crops should be cultivated and livestock reared, and the forested and watershed areas that should be protected from human activity. In our Ministry, we have, with the use of GIS technology, clearly defined the zones that are best suited for the production of various crops, and we have used the banana industry as the starting point for this re-orientation of land use. Henceforth, support will be given only to farms that fall within the agro-ecological zones demarcated as best suited for banana production, and cultivation outside of these areas is being actively discouraged.

Additionally, with the help of the FAO, we are developing a Land Use policy that will provide guidance to the Government on this most critical issue.

We must strengthen and strictly monitor our building codes, including possibly enacting regulations against new coastal developments, to ensure that commercial and housing developments, do not further imperil our fragile ecosystems.

We must implement integrated water resource management and coastal zone management strategies to protect the integrity of these vital resources. In St. Lucia we have, within the past two years, commissioned two units to address these issues, but we are aware that the fight is an uphill one. In any event, a critical element of the management strategies involves co-management approaches, and we have had positive experiences in this area, as demonstrated by the Talvan Water Resource Users Group and the Soufriere and Canaries Anse La Raye Marine Management Areas.

We must practice better soil and water conservation measures, together with implementing controls on animal stocking and promoting better grazing techniques.

Reforestation and better forest management strategies must be adopted. There has been significant work within our Ministry in re-forestation of critical watersheds and of riverbank stabilization exercises, but work must intensify in these areas.

Agronomic practices must be improved, and farmers discouraged from engaging in activities that destroy the environment. Fortunately, the adoption of the Good Agricultural Practice standard by the marketplace is providing the economic stimulus that will compel farmers to adopt more environmentally-friendly practices, and the premium market prices currently being paid for Organic and Fair Trade products are another pull in the right direction.

In some instances, cultivars and animal blood lines may have to be selected that will give us a greater chance of adapting to the changes brought on by GEC. This may call for radical changes in food production systems, and will undoubtedly result in an increased cost to the producer.

One of the gases contributing to global warming is methane, which is a direct by-product of livestock production systems. Any move to reduce methane emissions will require the use of new feed mixtures, but again, will come at some cost to the food system. While on a global scale we are relatively minor contributors to the livestock methane output, we must be cognizant of the fact that often global solutions are dictated down to developing countries that are victims, rather than agents, of the problem.

We need more definitive answers to the question of how will our food systems, our producers and our communities cope with and adapt to GEC. And this is why I believe today's workshop is of such critical importance. To paraphrase W.T. Anderson (Anderson, W.T. *To Govern Evolution*, Dallas: Harcourt Brace Jovanovich, 1987), during the early life of our planet, evolution followed the rules of Charles Darwin, but

what Darwin could not have predicted is that the superfit would not only survive but go on to change the very rules that allowed it to survive, to the extent that the evolution of our planet is now dictated more by the boundaries of human intelligence. If we accept the fact that human intelligence, if not common sense, got us where we are, then it is up to us to use that collective intelligence to fashion solutions to the challenges confronting us. Today's workshop continues the process of defining issues and formulating solutions.

But that is only the first part of the ultimate solution. The ultimate solution will involve getting the commitment of all concerned, from the policy maker down to the producer and consumer, in taking decisive action. In 1987, the World Commission on Environment and Development formulated 'a global agenda for change' and articulated that agenda in a publication entitled "Our Common Future". To quote from that publication, it was meant to serve "notice that the time has come for a marriage of economy and ecology, so that governments and their people can take responsibility not just for the environmental damage, but for the policies that cause the damage. Some of these policies threaten the survival of the human race. They can be changed. But we must act now." That was 15 years ago. We are still grappling with getting these policies changed, so Mr. Moore's options for dealing with Global Environmental Change may not be as ludicrous and facetious as they sound.

### **Bacon or Eggs?**

Which takes me back to my opening analogy: our participation in this meeting can either be an egg or bacon response. On being asked, during the latter part of her career, how involved she still was in tennis, tennis great Martina Navratilova said that for her it was an issue of bacon and eggs - the chicken was involved in the production of eggs, but the pig was committed to the production of bacon; so she was not just involved in tennis, she was committed to the sport. By the same token, therefore, we must view our participation in this meeting and in this GECAFS process as one of commitment, not just involvement. To do anything else would be to write a prescription for our eventual demise.

I thank you.