

# **Workshop Opening**



## Welcome Address

C. Layne<sup>1</sup>

Distinguished guests, participants, ladies and gentlemen.

Barbados is pleased to have been selected for the hosting of this Inter-Regional Workshop on improving Agro-meteorological Bulletins. First, I wish to extend to you, both on behalf of the government and people of Barbados and at the personal level a warm welcome to our shores. We are especially happy with your presence in Barbados at a time when there is an obvious decline in the number of visitors to our islands, as a consequence of the events of the past weeks.

Your programme for the next five (5) days indicates that a number of important and relevant topics are scheduled to be discussed. It is my fervent wish that during your deliberations some consideration will be given to addressing the needs of small and developing NMS. Progress for us in the area of application of meteorology to agriculture which is considered by some to be the most weather dependent of all human activities, has been glacial at best and non-existent at worst. NMSs such as ours have been experiencing difficulty in building capacity even limited to effectively make a contribution to the enhancement of agricultural production and food security.

Specifically, all efforts on the part of my predecessors as well as my recent attempts to obtain adequate resources for the training of an agro-meteorologist have been unsuccessful. The building of capacity is an important pre-requisite to the effective and efficient delivery of timely and useful agrometeorological information to the farming community.

The increasing demands for food and concerns with the need to achieve higher efficiency levels in the use of limited natural resources have placed greater emphasis on understanding and exploiting the relevant climatic resources for the benefit of agriculture and related sectors.

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Recent events in USA have further challenged the meteorological community and, more than ever before, there exists the urgency, as well as a definite need to do more to enhance our skills in operational, experimental and theoretical aspects of agricultural meteorology.

This mission provides further opportunity for National Meteorological Services to earn recognition, improve their creditability and visibility and in so doing, contribute in a meaningful way to the national economy.

As I understand it, the purpose of this workshop is to assess the current status of preparation of agro-meteorological bulletins in the six (6) regions of WMO, as well as to determine the different ways and means to improve the content and value of these bulletins.

Your programme for the coming week seeks to adequately address these and other lesser objectives.

I wish you well in your deliberations and hope that you will be able to experience some of the natural friendliness and hospitality of the local community. May your sessions be fruitful and successful and your stay in Barbados enjoyable and problem-free.

## Opening Remarks

M.V.K. Sivakumar<sup>1</sup>

On behalf of the Secretary-General of WMO, Professor G.O.P. Obasi, I have great pleasure in welcoming you all to this opening ceremony of the Inter-Regional Workshop on Improving Agrometeorological Bulletins. I seize the opportunity to thank the Meteorological Services of Barbados, in particular, Mr Chester Layne, Director and Permanent Representative of Barbados with WMO, for agreeing to host this meeting in Barbados. Dr Colin Depradine, Principal, of the Caribbean Institute of Meteorology and Hydrology (CIMH) who is the local coordinator for this workshop has been most cooperative in coordinating the arrangements for this meeting and I convey my thanks to him. Mr Tyrone Sutherland, Permanent Representative of the British Caribbean Territories with WMO has been guiding us right from the beginning in the organization of this event in the Caribbean and I would like to offer my sincere thanks to him for agreeing to be here with us today and deliver the keynote address. I am very pleased that Dr Ray Motha, President of the Commission for Agricultural Meteorology of WMO and Mr Lihwu Akeh, Vice-President of the Commission are both with us here at this workshop to guide us and help us develop appropriate recommendations for use by all the members of the Commission. We are grateful to the National Oceanic and Atmospheric Administration (NOAA) for agreeing to co-sponsor this workshop.

Why do we need an Inter-Regional Workshop to discuss how we can improve agrometeorological bulletins? Let me present some rationale for the workshop.

It is estimated that by 2020, the world population will reach 7.5 billion and that much of this population growth will occur in the developing world. To meet the increasing global demand for cereals, the world's farmers will have to produce 40 percent more grain in 2020. Although the global production of cereals and global cereal yields rose over the period from 1986-88 to 1996-98, the average per capita cereal production for the world remained stagnant over

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the period and actually fell in Africa and the Middle East regions. This disturbing trend has many implications for food security of the growing populations of the world.

In the developing countries, where adoption of improved technologies is too slow to counteract the adverse effects of varying environmental conditions, climate fluctuations are indeed the main factors which prevent a regular supply and availability of food, the key to food security. It has been demonstrated that judicious application of meteorological, climatological and hydrological knowledge and information, including long-range forecasts, greatly assists the agricultural community to develop and operate sustainable agricultural systems and increase production in an environmentally sustainable manner.

There are increasing demands for timely and effective agrometeorological information for on-farm applications. The growing interest in the possible impact of natural and human induced climate variability and long-term climate change on agriculture and forestry have created new demands for information from, and assessments by agrometeorologists. The need for reorienting and recasting meteorological information, fine-tuning of climatic analysis and presentation in forms suitable for agricultural decision making and insulation of marginal farmers with small holdings from the adverse impacts of weather vagaries has become more pressing.

Developments in communications and electronic media, in particular the ever-expanding cyberspace linkages through Internet and World Wide Web are changing the way people view information dissemination and exchange. The potential to enhance the international exchange of ideas, concepts, data and information at the global level is expanding rapidly. The enhanced computing power that is available today is making data manipulation much easier than ever before. Revolutionary changes in audio-video media make it easy to take the information to users. Geographical Information Systems and other spatial modelling tools make it possible to integrate biological, physical and socio-economic factors in a holistic manner. Hence the opportunity exists, more than ever before, to obtain and provide information to users through a variety of sources. Also it is now possible to reach a larger audience using cost-effective means that were just not available even a few years ago.

Therefore, the challenge in front of the agrometeorologists around the world is that more than ever before, there is a great need to more effectively integrate and deploy the skills we have developed in operational, experimental

and theoretical aspects of agricultural meteorology to make production in systems of agriculture and forestry more reliable, more efficient and above all more equitable in the world at large. The National Meteorological and Hydrological Services (NMHSs), or other departments providing agrometeorological Services, can contribute to the national economy, and best obtain recognition and remuneration for the investments made in agricultural meteorology, through the effective use of the information by the agricultural community in the widest sense by making the best use of the current advances in the audio-video media and the communications technology.

It is with this background that WMO is organizing this Inter-Regional Workshop on Improving Agrometeorological Bulletins. The purpose of this meeting is to assess the current status of preparation of agrometeorological bulletins in the six Regions of WMO and determine the different ways and means to improve the contents of these bulletins to facilitate timely and efficient on-farm operational decision-making that relies on agrometeorological information.

The specific objectives of the Workshop are to:

1. Evaluate how the NMHSs in six Regions of WMO determine the contents and methods of presentation of information in the agrometeorological bulletins that are issued in their countries;
2. Identify the shortcomings and limitations in the current methods of preparing agrometeorological bulletins;
3. Review the different improved methods and tools to improve the contents and presentation of information in the agrometeorological bulletins and their delivery to decision-makers in a timely fashion;
4. Formulate an effective training strategy to build the capacity of the NMHSs in the different WMO Regions to rapidly implement improved systems of preparing and disseminating agrometeorological bulletins.

Two agrometeorologists from each of the six Regions of WMO, who were nominated by the Presidents of their Regional Association, representatives of the different Caribbean countries who have agrometeorological services and other invited experts will present papers to address the above objectives. I am grateful to all the participants from the different Regions who have agreed to collate information from their Regions and prepared papers for this workshop. I look forward, with much interest, to their presentations.

The programme for the Workshop has been designed in such a way as to engage all the participants in comprehensive discussions on each of the specific objectives listed and develop appropriate recommendations. The proceedings of this meeting will contain the papers presented by the experts as well as the recommendations for improving agrometeorological bulletins. This volume is expected to serve as a major source of information to all NMHSs and other agencies involved preparing and distributing agrometeorological bulletins.

We have much work to do over the next five days and I am confident that the deliberations of this workshop would contribute significantly towards more effective drought preparedness and management at various levels in different parts of the world. On behalf of the Secretary-General of WMO, I wish you all a very fruitful meeting and a pleasant stay in Barbados. Thank you.

## Opening Remarks

Raymond P. Motha<sup>1</sup>

On behalf of the Commission for Agricultural Meteorology (CAgM), I want to thank all of the participants for coming to this workshop during these rather difficult travel times. We view this meeting as a very important step in acknowledging the value of weather and climate information for agriculture. The presence of these technical experts from all of the WMO regions gathered here this week will certainly generate excellent discussion and promote worthy brainstorming issues.

I want to extend my thanks to the Permanent Representative of Barbados, Mr. Chester Layne, for providing us this opportunity to discuss these issues in such a beautiful setting. I also wish to thank Mr. Colin Depradine, Principal of Caribbean Institute for Meteorology and Hydrology, for hosting this gathering in a very comfortable location which will facilitate an excellent meeting environment.

I am delighted by the presence of the Permanent Representative of the British Caribbean Territories, Mr. Tyrone Sutherland. His support for this meeting and for this very important topic of discussion is greatly appreciated by CAgM. My final note of thanks goes to Dr. M.V.K. Sivakumar, Chief of the Agricultural Meteorology Division of WMO, and, a very able scientist and advocate of the importance of agricultural weather to the global farming community.

We have a great opportunity here to exchange ideas and experiences, to perhaps establish some useful guidance, and, to formulate recommendations for improving agrometeorological bulletins. We should consider such matters as the quality of content, accessibility of input requirements, information delivery technology, and, of course, user needs. It is obvious that one format will not fit all user needs at the local level. However, standards can be developed to serve as a basic foundation from which bulletins can focus on specific requirements of the local user community.

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We have an opportunity to enhance the recognition that our products are important to assist decision-makers with timely and relevant information.

I sincerely wish you much success with these discussions and with a productive outcome of this meeting.

Thank you.

**The Importance of Agrometeorological Information  
and its Dissemination for Agricultural and Water Resource  
Management in the English speaking Caribbean**

Tyrone W. Sutherland<sup>1</sup>

Dr Ray Motha, President of WMO's Commissiona for Agricultural Meteorology,

Dr M.V.K. Sivakumar, Chief of WMO's Agricultural Meteorology Division,

Mr Chester Layne, Director of the Barbados Meteorological Service and Permanent Representative of Barbados with WMO,

Dr Colin Depradine, Principal of the Caribbean Institute for Meteorology and Hydrology

Participants and Colleagues,

Ladies and Gentlemen,

First of all, let me add my own welcome to all of you to Barbados, especially to those who are visiting for the first time and in particular to our friends from outside of this WMO region. It is always a pleasure for me to be in Barbados and I hope you will also find it pleasant. Indeed, I want to express my special thanks to the Government of Barbados, through you Mr Layne, for once more showing its commitment to meteorology and related sciences by being such a willing host for another gathering of this type. On behalf of the Caribbean Meteorological Organization, which is made up of the English-speaking Caribbean countries, I thank WMO for organizing this workshop and the National Oceanographic and Atmospheric Administration of the USA and the Caribbean Institute for Meteorology and Hydrology for their sponsorship. A special welcome to Dr Motha and Dr Sivakumar; your presence here today signifies the importance that the Commission and the Secretariat place on this workshop.

Ladies and Gentlemen, workshops on any topic related to agriculture and meteorology are always needed here in the Caribbean, as in any other

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part of the world, I'm sure, because of the special importance of agriculture in all our lives. In the Caribbean countries, both islands and mainland, agriculture has a long history of being the mainstay, or one of the most important sectors of our economies. In recent times, however, tourism has taken over as the number one sector in a number of islands, but that in itself has not diminished the importance of agriculture.

In the last decade or two, some primary crops in the Caribbean have been under pressure because of the international trading practices, prices and agreements. Sugar is not what it once was and more recently, the banana industry has been virtually brought to its knees. Banana producers in general comprise a few large plantations or companies, together with a large number of small private farmers. The same may be true, though in different proportions, for other large cash crops. All farmers know of the link between weather and agriculture, but it has been just a few of the larger producers that have had the means to either collect meteorological data, or to utilize information from meteorological or agrometeorological services.

One might ask, what type of agrometeorological data or guidance would a farmer in the Caribbean need on a routine basis? To give a few examples, farmers require information to help them in planning spraying operations for disease and pest control. Most farmers in the Caribbean utilize labour-intensive methods to spray their crops, while larger producers might use crop-dusting aircraft in their operations. How often have we seen expensive crop-spraying operations completely nullified by a sudden change in conditions! In several islands in the Caribbean, guidance of expected wind, temperature and atmospheric humidity, which impact on the effectiveness of this type of operation, has long been sought. Farmers also need information on expected soil and water content, soil temperature and evaporation rates for planting and harvesting activities. Expected rainfall rates are vital to farmers for determining when and how to apply fertilizers to their fields, because we know that the heavy rains we experience in the Caribbean may either wash away soil nutrients or bring in nutrients in soil from elsewhere.

All over the world, irrigation accounts for a large percentage of the vital freshwater resources. In the Caribbean, where we have two distinct seasons – dry and wet – irrigation must be managed properly when water reserves are low. Therefore, agrometeorological information to assist in irrigation planning is very important to both the farming community and water resources management. Indeed, in some of the Leeward Islands, for example, drought is the principal worry for both agriculture and freshwater management.

It is well known that severe weather events, such as tropical storms and hurricanes, have major short- and medium-term impacts on agricultural production. Indeed the entire national economies, often driven by the agricultural sector, may take several years to recover. But here in the Caribbean in recent times, there is a growing awareness that there could be medium- and long-term impacts on agriculture from variations in climate, and indeed on possible changes in climate, so that the need for appropriate information for these events to be provided in a timely and useable manner is now recognized.

How then are we doing in the provision of agrometeorological information here in the English-speaking Caribbean? In general, we could say that our Meteorological and Hydrometeorological Services provide well-established information to the public, the aviation industry and in a few cases, the water-resources sector. In particular, our bulletins of severe weather warnings for floods, tropical storms and hurricanes are well known and heavily relied upon. But these are general to the population at-large. For the most part though, we are still searching for ways to adequately contribute in the area of agrometeorology. During the course of the workshop, you will probably hear that our agrometeorological products are still in the early stages of development.

You will probably also hear that, in addition to the Meteorological Services, several other government units, such as within Ministries of Agriculture and Water resources, as well as universities and other institutions, may also have independent and compatible or complementary agrometeorological data sets, and may sometimes publish information for internal purposes, but do so without much sharing or collaboration with others. It is inconceivable to me that in countries as small as we are, with limited resources, we still have little collaboration, or even understanding, between agricultural and meteorological scientists, who should be working closely together. For example, I can recall several years ago when a ministry of agriculture in one of our islands was unable to give a reason for the failure of a particular crop because it lacked the appropriate data of its own, but some time later it was discovered that the Meteorological Service had very pertinent data, but did not even know that it was required.

At the same time, however, we have made significant progress in the medium time-scale predictions, such as in producing seasonal climate outlooks, the need for which, as I indicated earlier, is increasingly recognized. In this connection, I must commend the efforts of our own Caribbean Institute for Meteorology and Hydrology, which is collaborating

with other scientific institutions in developing this skill. As this information further improves and becomes more widely available, it could make a great contribution to the agricultural and water resources management.

Ladies and Gentlemen, with that bird's-eye view of our state-of-affairs in terms of agrometeorology, I must praise the World Meteorological Organization for organizing this workshop so that this region could share with its colleagues from the other WMO regions around the world, the experiences in providing information to an important economic sector. I know that several of the Meteorological Services of the Caribbean have plans to develop or upgrade their agrometeorological divisions and therefore this workshop will provide important and timely guidance. The information that the workshop provides is equally important to the CIMH, which provides much of the agrometeorological training in the region.

With this in mind, let me touch briefly on one a topic that I have raised several times in WMO. I believe that WMO's Agrometeorology Programme has a lot to offer developing countries such as ours. There have been many very successful agricultural programmes or experiments carried out by WMO, which have proven to positively impact on specific crop production in developing countries. But I believe that the Programme needs to be oriented – in parallel – towards a broader more grass-root approach. Not many of our Meteorological Services – and more so Ministries of Agriculture or agricultural research institutions - are that familiar with the good work that WMO is doing in this area. Therefore they are not quite sure in which ways they can receive help from WMO in building up their own agrometeorological programmes. I believe that WMO's Programme should be geared towards a partnership between professionals in the meteorological and agricultural communities and academia, to better understand agricultural problems that have a distinct meteorological influence and to develop products the reach and serve the end user of our products - the agricultural extension officers and the farmers themselves.

Ladies and Gentlemen,

My hope was to give you enough of an insight into the agrometeorological situation in the English-speaking Caribbean, in order to set the tone for what will be discussed over the next five days. I wish you every success in your deliberations and I look forward very much to the outcome of the workshop.

Thank you.