STATEMENTS ON CLIMATE CHANGE IMPACTS FROM INTERNATIONAL ORGANIZATIONS AND PARTNERS

Mr. Patrick Evans
Representative of the Food and Agriculture Organization (FAO), Sri Lanka
patrick.evens@fao.org

Climate change has become one of the most discussed and highlighted topics in recent years due to its potentially deleterious global impact. Economies and development of many countries have been significantly affected by the impacts of climate change during the past decade. Increasingly intense storms and weather events have been more destructive in developing countries because they were with fewer resources and limited adaptabilities to the dramatic changes in climate and thus are more vulnerable. Long term global food security is under increasing threat due to climate change.

The Food and Agriculture Organization of the UN (FAO) defines food security as a "situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life". Under the present context, achieving food security for all and to ensure all people have regular access to enough high-quality food to lead active and healthy lives is really a formidable task. Hence, the mandate of FAO is to increase agricultural productivity, improve nutrition, raise the standard of living in rural populations and contribute to global economic growth. In spite of the progress made over the last two decades in meeting above demands, about 870 million people still suffer from chronic hunger while 171 million children under five years of age are chronically malnourished, almost 104 million are underweighted, and about 55 million are acutely malnourished. Moreover, the world's population is predicted to increase to 9 billion people by 2050. Some of the world's highest rates of population growth are predicted to occur in areas that are highly dependent on the agriculture sector (crops, livestock, forestry and fisheries) and therefore, have high rates of food insecurity. Growth in the agriculture sector is one of the most effective means of reducing poverty and achieving food security in those communities.

In the process of improving agricultural and food production sector, unpredictable climate changes pose a great threat in complex ways. It affects food production directly through changes in agro-ecological conditions and indirectly by affecting growth and distribution of incomes and thus demand for agricultural produce. Changes in temperature and precipitation associated with continued emissions of greenhouse gases bring changes in land suitability and crop yields. As a consequence, global and regional weather conditions are expected to become more variable than at present, with increases in the frequency and severity of extreme events such as cyclones, floods, hailstorms, and droughts. Thus greater fluctuations in crop yields and local food supplies and higher risks of landslides and erosion damage can adversely affect the stability of food supplies and thus food security.

Therefore, under the present climatic scenario with greater insecurity of food supplies, it is really a high time for a forum with different institutions to work together to discuss a way forward with possible adaptation and mitigation measures to face this challenging situation. Hence, with great pleasure I forward this message to the "International Conference on Climate Change Impacts and Adaptations for Food and Environment Security" which will contribute to agriculture adaptation to changes in climate to ensure food and environmental security in Sri Lanka.

Dr. Ananda Mallawatantri
Energy and Disaster Risk Reduction Programs of UNDP,
United Nations Development Program, Sri Lanka
ananda.mallawatantri@undp.org

Climate Change involves significant variations in the rainfall and temperature regimes as a result of global warming. These anticipated changes require countries to take additional efforts or precautions to minimize the impacts on human, livelihoods, biodiversity as well as to infrastructure. Well-conceived adaptation measures to climate changes are a must to ensure that post-conflict rapid development in Sri Lanka is sustainable and resilient.

Three key disasters that impact Sri Lanka are drought, flood and landslide – interestingly all of them are water related and can be aggravated or controlled by human interventions. All three are climate related. It is encouraging to note the vast interest in Sri Lanka on climate change and climate change adaptation in particular.

Sri Lanka is in an excellent position to develop and implement adaptation measures to protect the livelihoods and infrastructure from the potential impacts of climate change. Sri Lanka has compiled an impressive collection of literature on climate adaptation (www.climateadaptation.lk) and a historical disaster event database (www.desinventar.lk). Also the recently launched nine hazard profiles on coastal erosion, drought, flood, landslide, lightening, sea level rise, storm surge, tropical cyclone and tsunami (www.hazard.lk) is a solid base for climate change adaptation work in Sri Lanka, as eight out of nine (except tsunami) are linked to climate change directly and indirectly.

The Climate Change Secretariat through the Second National Communication to UNFCCC, Climate Change Policy, National Climate Change Adaptation Strategy and Adaptation Action Plan development, provides policy and strategic framework. The Rice Research Development Institute of Sri Lanka has already completed work on climate resistant (salt resistant and flood resistant) paddy varieties and management practices.

Success of climate change adaptation is highly dependent on a number of factors, namely, understanding the climate risks; adequate education and awareness among stakeholder groups extending from political hierarchy to government to community level; identification of correct technologies and best practices needed taking into consideration the local knowledge; and implementation of programmes or interventions with stakeholder participation and extensive monitoring of the results and impacts.

The conference on "Climate Change" organized by the Coconut Research Institute along with partners will help improve our knowledge and provide the enabling environment to come together as institutions, companies and communities to face the challenges of climate change.

Dr. Palitha Bandara
Focal point- Environment & Climate Change, Sri Lanka Resident Mission,
Asian Development Bank (ADB), Sri Lanka
kbandara@adb.org

Over the past few decades the Asia region has seen higher temperatures and a sharp rise in the frequency of extreme weather events including droughts, floods and tropical cyclones. Without urgent action to address this pressing issue, the region will face a difficult future marked by declining freshwater and crop yields (affecting food security), increasing loss of forests and farmlands, rising sea levels threatening island dwellers and coastal communities, and a surge in infectious diseases such as dengue and malaria.

All Asian countries have prepared national climate change action plans and related documents which is a clear sign of importance they assign to climate change in national economic development. However, a daunting array of policy, governance, fund allocation and capacity building challenges face these countries to implement all aspects of climate change action. If current patterns continue, Asia will be projected to account for about 45% of global energy-related emissions within next two decades. Asia's cities are among the largest contributors of new greenhouse gas emissions with associated adverse health, traffic congestion, water supply and other problems. Transport is the fastest growing source of these emissions. This indicates the need of sustainable transport and urban development to avoid further massive environmental and economic costs and to bring about clean air, safer roads and generally more livable cities. A recent ADB report indicates that up to 75% of Southeast Asia's greenhouse gas emissions are caused by land use change, especially deforestation. Asia is the home to the largest population and highest population density at risk from climate change and a vast expansion of adaptation measures is thus needed.

It is required to have a comprehensive study to help developing countries to build climate change and disaster risk reduction in vulnerable sectors and mitigate greenhouse gas emissions of highly polluting sectors through capacity building, knowledge sharing and the generation of project concepts for adaptation and mitigation interventions. The funding agencies support for scientific, economic, and social impact assessments of climate and disaster risk to guide policymakers and regulators in responding to climate change is prime important. Moreover, they can provide technical support to develop data management systems and data models by acquiring scientific, social and geographical data. Modern technologies such as Geographical Information System (GIS), satellite Remote Sensing (RS) and digital data modeling techniques can be used. The governments shall facilitate to maintain such databases by regularly updating and to improve the data models. As such, the governments will increase appropriate response to climate change and disasters with the support from civil society. The outcome will be that governments are able to integrate climate change and disaster response with social and economic development goals. An essential component of an effective global solution would, therefore, involve adequate transfers of financial resources and technological know-how from developed to developing countries.

Ms. Darshani De Silva
South Asia Environment and Water Resources Unit, South Asia Sustainable Development Department,
The World Bank (WB), Sri Lanka
ddesilva4@worldbank.org

Climate change is a fundamental threat to sustainable development and the fight against poverty. The World Bank is concerned that without bold and forceful action now, the warming planet threatens to put human well-being out of reach of millions and reverse decades of development efforts while amplifying existing challenges posed by high population density, widespread poverty and weak government institutions.

Despite commitments so far for cutting emissions, the world still needs to adapt to the unavoidable impacts of climate change. Increasing magnitude of precipitation and changing seasonality are likely to lead to greater levels of flooding, and higher risks of dry periods and droughts. Risk of flooding and dry season flow reductions in major rivers will threaten agriculture and access to reliable energy. A recent report published by the World Bank, "Turn Down the Heat: why a 4°C warmer world must be avoided" indicates that Sri Lanka's 20 to 30 percent of drier months will experience unprecedented heat with very disastrous consequences on agriculture, livelihood and health. Negative impacts of climate change are more severely felt by poor communities who are more vulnerable because of their high dependence on natural resources, located in drier and warmer or coastal areas and their limited capacity to cope with climate variability and extremes. Adaptation is at the core of the World Bank's support to developing countries as it is critical to sustaining and advancing development achievements in these countries. Providing financing for adaptation is a priority for us with many programs focused on adaptation in arid and semi-arid lands and coastal areas. These programs integrate a menu of financing options available from several sources, such as IDA, IBRD, GEF, the Least Developed Countries Fund, the Special Climate Change Fund, the Adaptation Fund, the Climate Investment Fund and bi-lateral co-financing.

The World Bank works with countries to assess risks from climate change to the development. Countries need support to re-position their development plans so that climate change is factored into their planning process. For example, the Bank in collaboration with other development partners supports the Government of Maldives to respond to the challenges of climate change and the opportunity to shift to low carbon growth. There are increasing efforts to ensure synergies between adaptation and mitigation when designing and planning climate actions. For example, the Bank also supports work on climate smart agriculture where the focus is on a triple-win: carbon sequestration, food security and climate resilient livelihoods. We have also started making more conscious efforts to climate and weather proofing the Bank investments as part of sustaining the development interventions.

There is also great focus on knowledge products that give better access to data on climate change for development practitioners. The Climate Knowledge Portal provides the most comprehensive source of quality climate information, knowledge and analysis tools on climate change.

The World Bank continually seeks for new and innovative ways to support its client to sustainably develop within the changing climate.

Mr. Jeremy Bird
Director General, International Water Management Institute (IWMI),
Sri Lanka.
j.bird@cgiar.org

The "hydraulic civilization" of Sri Lanka has endured for millennia. There can be few countries where water management has such a long history. Indeed it is one of the reasons why the International Water Management Institute, was sited in Sri Lanka.

Underpinning this cultural heritage is an abundance of water. Seasonality and geography affect access, of course, but overall Sri Lanka's water resources are sufficient for its agriculture, domestic use and economic growth for years to come.

But we should be cautious of complacency. Uncertainty is in the air. There is no doubt that our climate is changing, but how will this affect the water sector? Changes in water quantity and quality due to climate change are expected to reduce the food security and increase the vulnerability of poor rural farmers. This will be especially true in the arid and semi-arid tropics, including areas such as Sri Lanka's Dry Zone.

Rainfall patterns will change. Changes in rainfall intensity and variability are projected to increase the risk of flooding. Sea level rise is projected to extend areas of groundwater and estuary salinization, resulting in a decrease of freshwater availability for humans and ecosystems in coastal areas.

Using computer models it is estimated that by 2050 Sri Lanka will experience a 25 % increase in the need for irrigation water for rice paddy. Tea cultivation, especially at low elevations, will be affected and coconut production after 2040 will not be sufficient for local consumption. By the beginning of the next century, annual projected losses to the economy as a result of climate change may top LKR 40 billion.

When faced with such uncertainty, science can help. Not only can research help us predict what challenges lie ahead; it can also help us identify practical solutions.

IWMI, together with its partners in many Sri Lankan institutions, is dedicated to creating the evidence base that can help policy-makers make informed choices about the best use of water, land and other natural resources.

In Jaffna, for instance, we have used our expertise in satellite remote sensing to help map the proliferation of farm wells. This will enable us to offer practical policy advice in what has traditionally been one of the islands more arid regions.

We are also developing our capacity in flood mapping and management and will use this to help explore more options for improved flood control and looking at how farmers can benefit from floodwater storage and spate irrigation.

The partnership between IWMI and Sri Lankan Government agencies has made a significant contribution to the development of Sri Lanka's climate change adaptation policies. IWMI research findings have been incorporated in the country's current 5 year Climate Change.

Climate change adaptation and mitigation will require close cooperation between the scientific and development communities. This meeting therefore, initiated by Coconut Research Institute, is both timely and important. I hope that the deliberations of the next two days will be productive and make a positive contribution to the improved resilience of Sri Lankan people to climate change.

Dr. V. P. Singh
Regional Coordinator, South Asia, World Agroforestry Centre (ICRAF),
New Delhi, India
v.p.singh@cg.ar.org

It is an honor and a rare occasion for me to be part of this very important "Conference on Climate Change". This topic is very close to my heart as the climate change research is one of the six major programs of our center, the World Agroforestry Centre. It is also a rare opportunity for me to put forth my views through this note to this august body of policy makers, researchers, research managers, development specialists and climate change experts.

Since the conference is organized in this beautiful island nation, Sri Lanka, which I have been fascinated with for over three decades, I have tried to organize my views on Climate Change in the context of Island Nations and Agroforestry, the last one being the overall mandate of the institution I am officially attached to.

Climate change is a real happening and all the systems are affected by it. It is not that the climate has started changing only now, it has been continuously changing in the past, and is expected to continue doing so in the future also. However, the impact of climate change is increasingly being noticed on account of the likelihood of its occurrence and the severity of extreme events, may they be the droughts, floods, heat waves, cloud bursts, sea level rise and so on so forth. Such events are becoming more frequent, extensive and intensive. The two Tsunamis within the last ten years and the recent catastrophic floods and landslides in India that killed tens of thousands of people is a sad reminder of such a reality.

A large segment of climate change has been attributed to the uncontrollable natural causes, and anthropogenic factors, the irrational & unjustifiable human activities. Whatever the causes, everybody throughout the globe has experienced suffering from the ill effects of climate change. The island nations routinely exemplify such a happening. The small, fragile and resource poor in natural, social, financial and knowledge capital become more vulnerable to such ill effects because they neither have the capacity to insulate nor to adapt themselves to it on short notice. Nevertheless, they been trying to adjust and learn to live with it and also mitigate it to some extent.

The emission of greenhouse gases will continue, resulting from various developmental initiatives. While every effort should be made to mitigate climate change effects, it is very important to build up adaptive capacity and reduce the vulnerability of the natural resources and the communities. Strategies for adaptation should focus on the people most affected by climate change and aim to reduce the most significant hazards they may have to face.

Island nations have unique characteristics. Among others, they have specific traditions, mostly depend on sea resources and limited but essential terrestrial systems for their sustenance and livelihoods, have local self-sufficiency aspirations (goals), total dependence on limited local resources and their use competition & interactions among various enterprises, limited scope for intensified and diversified production and holding, processing and marketing of the produce.

For the simple fact of being an island and isolated from the neighbors, the quality and high recurrent cost of transport, energy supply, communication and other essential services disadvantage these nations by adding to the transaction cost of doing business than the business itself. These nations also have fragile and thin natural resources base and thus, are more vulnerable to the natural disasters and climate change effects.

The agricultural systems practiced in these islands are diverse depending on the ecological suitability, local requirements and cultural preferences. The

agricultural systems have a variety of crops which include food crops, medicinal species and industrial crops. While some island countries specialize on selected industrial crops such as sugarcane, cocoa, coffee, vanilla, fruits and vegetables, others grow crop mixtures to meet the needs of the local population. These agricultural systems have been supporting their economies and meeting the livelihoods of the people over many years.

The farming traditions and practices of the island nations are also unique. They mostly have inter-spread agriculture systems and little scope for further expansion laterally. Therefore, they practices multi strata farming and thereby maintain a high degree of plant diversity & density for various uses in relatively smaller geographical area.

As in any other part of the world, the populations in these countries are increasingly exerting more pressure on the natural resources. In agriculture, land degradation and loss of productivity are observed due to the lack of effective land care systems, climate change impacts, and inadequate technological support from focused research and development efforts.

Trees have a tremendous capacity to reduce land degradation; efficiently recycle nutrients and build soil fertility, increase soil organic matter content, mine and pump up nutrients from deeper soil layers to the crop root zone and change soil environment; and create a conducive above ground microenvironment for efficient crop growth and carbon sequestration. The species selected either indigenous or exotic, should have the ability to integrate with the currently grown agricultural crops; food and other economic crops to meet the needs of the populations and excess for value addition into commercial products. Practicing agroforestry, a combination of field crops with a tree component in the existing or new agricultural systems therefore, runs on the forefront of options as means to meet the end, and not the end by itself.

In view of the above therefore, it is necessary that the island agriculture systems be assisted by considering them as a unique system and specialized way of farming instead of clubbing them together with other systems. Island agriculture be assisted through concerted efforts on strengthening of the natural resource base to intensify production while reducing greenhouse gas emissions, developing provisions for processing and marketing of the produce on sustainable basis and by building and developing the technical capacity of the communities to meet their needs and addressing the challenges of climate change & other negative environmental processes on their livelihood options.

From the proceedings of the conference, I hope this august body will draw a road map and action plans for the mitigation and adaptation to climate change. I look forward to receive your recommendations so that we can factor them in our collaborative research plans.

I would like to thank the organizers of this conference, especially Prof. H. P. M. Gunasena for extending the invitation to share my views on climate change with you. On behalf of the South-Asia Regional Program of the World Agroforestry Centre and on my personal behalf, I would like to assure you of our full support in any manner possible to address the challenges of climate change that you are faced with.

With these few words, I wish a great success to this great conference.

Thank you and have two very productive days ahead.

Mr. B. M. U. D. Basnayake
Secretary, Ministry of Environment & Renewable Energy,
Sri Lanka

Climate Change which is the ultimate outcome of the global warming is now being universally recognized as the fundamental human development challenge of this century. Global warming is attributed to increased concentration of atmospheric green house gases (GHG). The post-industrial era has recorded a marked increase of GHGs in the atmosphere. During last three decades, concerns have constantly been growing on climate change and their consequences. Having recognized the global warming and associated climate change phenomenon, the Earth Summit held in Rio de Janeiro in June 1992, has adopted the United Nations Framework Convention on Climate Change (UNFCCC) and a legal instrument of the UNFCCC, Kyoto Protocol in 1997. Aligning with the global community, Sri Lanka has ratified the United Nations Framework Convention on Climate Change (UNFCCC) in November 1993 and subsequently the Kyoto Protocol in September 2002.

One of the important areas for the effective implementation of UNFCCC is climate change impacts research. A broad array of scientific knowledge on the adverse impacts of climate change has been gathered over the last few decades. However, in many respects it remains fragmentary, and a quantitative synthesis of climate impacts, including consistent estimates of uncertainties, is still missing. According to the Intergovernmental Panel on Climate Change (IPCC), climate impacts research is heavily reliant on the robustness of impact projections. Uncertainty propagates from observational data, climate models and socio-economic scenarios, through to impact and adaptation assessments. In the light of the great wealth of existing knowledge and continuous need for policy-relevant research results, our community is perfectly placed to combine our individual contributions to initiate a coordinated climate impact research agenda.

International Conference on Climate Change Impacts and Adaptations for Food and Environment Security on the theme 'Sustaining agriculture under changing climate' aims to develop a new vision for climate impacts research by laying the foundations for bring climate change researchers, experts and policy makers to one platform, to update the knowledge, identify problems, research gaps and promote positive actions to combat the adverse impacts of climate change.

It is my belief that outcome of this conference will help in filling the knowledge gaps in the area of adaptation to climate change with regard to the sustainable agriculture. Such investigations will enable to review and update the existing national adaptation strategies and also would improve the information and data available to decision-makers for developing plans and formulating future policies relevant to the climate change, agriculture and environment towards the sustainable development.

I take this opportunity to express my sincere gratitude to the Coconut Research Institute, Ministry of Environment and Renewable Energy, Sri Lanka and the World Agroforestry Centre Regional Office for South-East Asia, India for their collaborative effort in organizing this timely important event.