Climate Change in Agriculture: Voices from the Paris Conference

The following are extracts from interviews conducted by T Jayaraman in Paris between December 1 and 11, 2015.

James Kinyangi, Principal Scientist and Regional Programme Leader, East Africa, Consultative Group on International Agricultural Research (CGIAR) Programme on Climate Change, Agriculture, and Food Security (CCAFS)

On ensuring food security in 2050:
We need an increase of nearly 60 per cent in order to meet global demands for major commodities such as maize, rice, wheat, and soybean by 2015, but current yields are falling short of that. Trends reflect rising costs, growing resource constraints, and increasing environmental pressure. These factors will inhibit the supply response in virtually all regions. We must increase production in order to meet demand, but increasing the area of land under agriculture presents major environmental costs such as from rising greenhouse gas emissions.

On the impact of climate change on yields:
When you look at long-term data, we already see the negative impact of climate change on crop production. For maize and wheat and other major crops, we are experiencing significant climate-associated reductions in yield. We anticipate that as climate change progresses it is likely that current cropping systems will no longer be viable in many locations. In Africa, for example, maize cultivation, according to some recent estimates, will not be viable across almost 3 per cent of the continent, whether you do the modelling under the higher A1 emission scenario or the lower B1 emission scenario. Current projections on area suggest that almost 335 million people will be affected. The projections suggest that the affected population will have to do some unexpected adaptation, including perhaps switching from mixed crop-and-livestock system to only livestock systems to sustain their livelihoods. Additional pressures come from changing patterns of pests and diseases; these call for increasing our focus on the integrated management of agricultural systems.

On plant pests and disease and climate change:
In the Horn of Africa, there are diseases associated with changing seasonal conditions, diseases such as Rift Valley fever. Its onset is normally associated with

changes in climatic conditions. There are also rusts, especially fungal diseases, which only develop at a certain moisture level in the atmosphere. We find that when most of these conditions are met, disease spreads across large areas.

On tendencies in the literature to conflate current variability with climate change:
From the perspective of science, the problem of uncertainty in understanding and interpreting climate-related signals and, consequently in the associated planning and action for adaptation in agriculture, is a major challenge for many of us. A lot of our knowledge is drawn from information derived from projections and modelling, but projections always have a degree of uncertainty. Uncertainty should not, however, become a reason for not taking action. With my colleague Sonia Vermuelen and others, I have written recently in the *Proceedings of the National Academy of Sciences of the United States of America*, that even when our knowledge is incomplete, we still have robust grounds for choosing best methods of adaptation, actions, and pathways by being pragmatic in capacity scenarios and environmental management. Using projections we can test promising options against a range of scenarios. Decision makers need to sift through options at different grades of scientific uncertainty.

On changing approaches to planning in agriculture:
Food systems differ regionally - some of us in the north are producing food from very intensive systems, and some of the food being produced in the South is mainly from extensive systems. So, when you consider the use of natural resources in both systems you will find that in the North is very heavy in the use of fertilizers, it is very heavy in the use of water, it is very heavy in the use of energy. In the South it is quite the opposite — there are very low-input food systems.

There are also variations across the South. South Asian countries have low per capita food loss as compared to countries of Africa. Within our adaptation plans, we need to share South-South lessons across regions. What does Asia do in order to reduce per capita food loss that Africa could borrow from and integrate into their own planning process? The whole suite of solutions around climate information and provision of climate services including insurance for agriculture, are crucial for adaptation. Transferring skills and knowledge across regions will be one of the most effective ways to implement the adaptation plans.

On whether the Paris Conference paid enough attention to agriculture:
The straight answer to your question is that the attention is there, but the will to take action on agriculture is the problem. I say that the attention is there because if you look at the commitments made by 133 parties as part of the INDC process, 80 per cent have included agriculture in climate change mitigation targets or actions. Nearly two-thirds or at least 64 per cent have noted agriculture's importance in climate change strategies. Women's participation in agriculture is also reflected in INDCs. Nearly 40 per cent of the INDCs either refer to gender equality as an important goal

of climate change action or some form of goal for a policy action. In close to 30 per cent of INDCs, mitigation targets in agriculture are conditioned on international financial support. So, there are bold proposals for funding some mitigation options in agriculture.

On the role of genetically modified crops in the era of climate change:
Genetic modification is one way to fast-track and increase gains in agricultural production and contribute to food security, but the acceptance of GM crops politically and ethically is really continuing to slow the whole movement. I think what will help is addressing most of the ethical and safety issues that are surrounding GMOs; that will also involve some kind of legislative and legal mechanisms on how these products move across borders, across countries and across regions. I think the more we address the safety concerns of GMO, the more GMO will play a role in fast-tracking the fight against hunger globally.

Odemari S. Mbuya, Professor of Agricultural Sciences, Florida Agricultural and Mechanical University

On the criticism that the United States Government does not pay adequate attention to climate change and is not doing enough for climate mitigation:
Scientists from United States have been leading the world in terms of research and education on sustainability ideas. The problems are of politics and political will. The United States is joining late, but better late than never. Before the Paris Conference, some 218 universities committed to take action on climate by signing the American Campuses on Climate Pledge. So academia strongly believes that climate change is not abstract but something real and that the time for talking is over. If we do not act, then we are writing our very own obituary.

Chu Van Chuong, plant pathologist and Deputy Director General, International Cooperation Department, Ministry of Agriculture and Rural Development, Government of Viet Nam, and Director, Rural Water Supply and Sanitation Partnership (RWSSP) Coordination Unit, Viet Nam

On the impact of climate change on agriculture in Viet Nam:
We have several scenarios on the impact of climate change on agriculture in Viet Nam. Agriculture in our country comprises crop production, fisheries, forestry, and animal husbandry. Agriculture is being affected by climate change. First, we had an extreme climate event last year: we experienced severe drought, the worst in 70 years, in the central part of Viet Nam. This drought affected crop production as well as animal husbandry. Agricultural activities were very seriously affected by this drought. The second event, in late 2014, was heavy rain in the northern part of the country, in Quang Ninh province. People have not experienced nature like this for over 100 years. The rain caused flooding, landslides, deaths, and the destruction

of crops. One reservoir was broken and caused a lot of damage to crops and allied activities such as animal husbandry.

To cope with such events, our Ministry has developed and approved an action plan to respond to climate change from 2011 to 2015, with a vision for 2030. First, we deal with crops, and based on scientific research, we will restructure cropping patterns in some areas, especially the central and southern parts of Viet Nam. We will focus on the Mekong delta for rice production. Secondly, to develop resistance to extreme climate events, we need to develop new crop varieties such as saline-tolerant varieties of rice, and drought-tolerant legumes. We also need research on the impact of pests and disease, because when the weather is warmer, more disease and pests may occur. We plan to restructure irrigation and reallocate areas that are suitable for cattle rearing and especially for fisheries.

For aquaculture, we have to build an action plan to cope with the effects of salinity intrusion, sea-level rise and the lack of groundwater. We want to plant mangroves along the coastline, so that mangroves can be the regulator of micro-environments for the region.

On seeking international cooperation in the area of climate change adaptation:
Our priority is on most vulnerable areas, first the Mekong river delta, then along the coastal areas. We would like to have cooperation on developing early-warning systems, to set up a database and analyses for forecasting extreme climate events. We also want cooperation in scientific research on disaster or risk management, forestry, and irrigation and water management.

On the problems of small farmers in the context of climate change:
The first is flooding. The second challenge created by climate change is new diseases and pests. The varieties currently in use may not be suitable for the new challenge because of the warmer climate. We have to think about how scientists can help farmers choose suitable varieties and suitable planting conditions. This is our long-term vision.

Anand Patwardhan, Executive Director, Technology Information Forecasting and Assessment Council (TIFAC), Department of Science and Technology, Government of India

On public figures confusing climate variability with climate change:
One of the big steps in the Fifth Assessment Report was to try and distinguish between climate variability and climate change. In many situations, although changes cannot be attributed with certainty to climate change, it can be said that observed changes are consistent with climate change. Our ability to discriminate between natural variability and variability on account of human-induced climate change is improving. This ability covers not only meteorological variables such as

temperature and rainfall but also biophysical systems, such as sea level rise, coastal erosion, or glacial melt.

On changes in India that are beyond natural variability:
An example is the intensification of rainfall, or a move towards more heavy rainfall days while seasonal averages remain the same. That is very consistent with what may be expected with climate change.

On why adaptation finance was a key issue at COP 21:
The Convention has language that supports adaptation and mitigation. In the case of adaptation, the Convention simply says that developed country parties will support developing country parties with regard to adaptation. There is no specificity in terms of paying for agreed incremental costs, for instance, as is the case for mitigation. In addition, support in this regard can be interpreted broadly, to include information, capacity building, training, enabling activities, and so on. The Convention said that developed countries would initially support enabling activities such as vulnerability assessments, capacity building, and training, going on eventually to support actual interventions on the ground. After the Marrakech COP, specific financial mechanisms were created. Initially the Global Environment Facility (GEF), which is the financial mechanism of the Convention, did not support adaptation because the GEF trust fund was specific to producing global environment benefits. As we know, most of the benefits of adaptation are local benefits, because they are aimed at reducing the vulnerability of communities, households, and people. After Kyoto, three new funds were created, the Adaptation Fund, the Special Climate Change Fund (SCCF), and the Least Developed Country (LDC) Fund. These funds were meant for adaptation activities. Of the three funds, the LDC Fund and SCCF are donor funds, so they are voluntary contributions. To this date, the Adaptation Fund remains, perhaps, the most novel mechanism for finance, both in terms of structure and resources, because it was supposed to be funded out of the 2 per cent of the Certified Emission Reductions (CERs) under Clean Development Mechanisms (CDMs). The Adaptation Fund also had a number of features that were novel and for which actually developing country parties fought very hard. For instance, one of the features of the Adaptation Fund is the concept of Direct Access, which means that funds can flow directly to recipient countries without having to go through an implementing agency that serves as a gatekeeper. It was also envisaged that the Adaptation Fund cover the full costs of certain activities, not just the costs of implementation or additional costs. Donors apprehend that, if the distinction between adaptation and development were removed, development activity would become eligible for funding.

The Adaptation Fund is now in limbo, because the Kyoto Protocol is in limbo. The LDC Fund did get resources and these were meant specifically for the least-developed countries to implement their urgent and immediate needs, but over the last year and a half, there has been a complete hiatus even with the LDC Fund. So the dirty little

secret, so to speak, is that there was practically no money flowing for adaptation through the multilateral process last year.

On developing countries' current strategies with regard to adaptation finance:
Copenhagen promised to mobilise up to 100 billion dollars a year by 2020, the sum divided more or less equally between adaptation and mitigation. After Copenhagen, a two-track strategy emerged: on the one hand, to push for this 100 billion and to push the loss and damage agenda on the other. The loss and damage agenda comes from the notion that there will be a residual impact that countries will face even with adaptation.

With regard to adaptation finance, the emphasis has been on the Green Climate Fund (GCF), which was the main vehicle created by Copenhagen and Cancun to deliver resources. Developing countries have been pushing to make the GCF operational but progress has been very slow. The GCF is now operational, but its track record of delivery of resources is very poor. Developing countries need to understand that the reality is that the actual availability of funds is likely to be limited.

On the relationship between adaptation finance and adaptation in agriculture:
Most of the adaptation finance, at least from multilateral sources, has gone to water, disaster management, and hydro-meteorology. Hydro-meteorological observation systems are typically capital-intensive, and can be viewed as basic enabling infrastructure. Funds have not gone on a large scale specifically to agriculture.

On guidelines for India's strategy on adaptation finance:
First, we have to continue to press for adaptation finance. There have been many attempts to try and restrict adaptation finance to particular kinds of countries. The LDC Fund was a window for the Least Developed Countries (LDCs). There have been calls to create special windows for the Small Island Developing States (SIDS), for Africa, and so on. India is particularly vulnerable to climate change, and needs to stand up on behalf of the developing world and say that adaptation finance is an obligation that must be met. Secondly, India must confront the reality that adaptation finance is limited and much of it likely, in fact to, go to these windows. So our domestic priority must be to make investments for adapting to climate change in our main sectors, agriculture and water, and infrastructure for cities.