OUR COMMON FUTURE UNDER CLIMATE CHANGE

International Scientific Conference

ABSTRACT BOOK

7-10 July 2015 • Paris, France

This Abstract book is based on a compilation of all abstracts selected for oral and poster presentations, as of 15 May 2015.

Due to the inability of some authors to attend, some of those works will therefore not be presented during the conference.

OUR COMMON FUTURE UNDER CLIMATE CHANGE

Welcome to the Conference

Welcome to Paris, welcome to 'Our Common Future under Climate Change'!

On behalf of the High Level Board, the Organizing Committee and the Scientific Committee, it is our pleasure to welcome you to Paris to the largest forum for the scientific community to come together ahead of COP21, hosted by France in December 2015 ("Paris Climat 2015").

Building on the results of the IPCC 5th Assessment Report (AR5), this four-day conference will address key issues concerning climate change in the broader context of global change. It will offer an opportunity to discuss solutions for both mitigation and adaptation issues. The Conference also aims to contribute to a science-society dialogue, notably thanks to specific sessions with stakeholders during the event and through nearly 80 accredited side events taking place all around the world from June 1st to July 15th.

When putting together this event over the past months, we were greatly encouraged by the huge interest from the global scientific community, with more than 400 parallel sessions and 2200 abstracts submitted, eventually leading to the organization of 140 parallel sessions.

Strong support was also received from many public French, European and international institutions and organizations, allowing us to invite many keynote speakers and fund the participation of more than 120 young researchers from developing countries. Let us warmly thank all those who made this possible.

The International Scientific Committee deserves warm thanks for designing plenary and large parallel sessions as well as supervising the call for contributions and the call for sessions, as well as the merging process of more than 400 parallel sessions into 140 parallel sessions. The Organizing Committee did its best to ensure that the overall organization for the conference was relevant to the objectives and scope. The High Level Board raised the funds, engaged the scientific community to contribute and accredited side events. The Conference Secretariat worked hard to make this event happening. The Communication Advisory Board was instrumental in launching and framing our communication activities on different media. We are very grateful to all.

We very much hope that you will enjoy your stay in Paris and benefit from exciting scientific

interactions, contributing to the future scientific agenda. We also hope that the conference will facilitate, encourage and develop connections between scientists and stakeholders, allowing to draw new avenues in the research agenda engaging the scientific community to elaborate, asses and monitor solutions to tackle climate change together with other major global challenges, including sustainable development goals.

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31% (34%) and 26% (30%) of the variations in banana yields respectively.

The results indicated high likelihood of warming trends (2021–2050) with respect to the climate scenarios except RCP 2.6 simulation cooler (seasonal surface air temperature) and drier (seasonal rainfall) than current observations, seasonal surface air temperature and rainfall simulation of RCP 4.5 are slightly warmer and wetter than RCP 2.6 simulations. The projected seasonal rainfall and surface air temperature is more amplified in RCP6.0 compared with all other scenarios and only cooler than RCP 8.5 surface air temperature simulations (by ≈1.7 oC). Future banana suitability mapping indicate a larger (smaller) area suitable for banana production under RCP 6.0 and RCP 4.5 (RCP 2.6 and RCP 8.5) for the study period.

This study provides critical evidence of climate variability and change, establishes linkages between climate variability and banana productivity over Uganda that can used to develop coping and adaptation strategies to improve banana productivity and enhance food security over the region.

P-2224-23

Medicinal and Aromatic Crops: An alternate proposition for exploiting abiotic stresses

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The demand for herbal drugs, plant based aroma chemicals and natural products is increasing at a speeding pace owing to the uniqueness, diversity and effectiveness of the associated crops used for. The secondary metabolites synthesized in medicinal and aromatic crops (MACs) also protect them from challenging circumstances like defence against certain stresses. In some cases, stress has been shown to bear positive effects on the production of secondary metabolites. The unique features of these MACs are that, many of them have the potential to withstand abiotic stresses to a higher degree as compared to traditional crops. This is also due the fact that, unlike agricultural crops, the MACs are not so sensitive to availability of soil moisture / temperature/ photo-periodism etc. In many cases vegetative parts are the ultimate products. Hence, there are lot of flexibilities in adjusting the planting and harvesting time.

Many of MACs are considered as high value crops presenting higher returns to the growers. However, cultivation of these MACs may not be encouraged at the expense of traditional agricultural crops already growing on well managed fertile lands. While several attempts are being taken up using molecular and modern approaches to fulfil the impeding demands of natural products, yet still the commercial production of related crops under field conditions remains as major option. The attractive proposition, therefore, appears to evaluate and promote these crops on marginal lands which might be facing some kinds of abiotic stress. These crops can manage to improve productivity and economic output compared to traditional crops.

Various possibilities of growing medicinal and aromatic plants under different types of abiotic stresses and their evaluation in terms of imparting benefits over traditional food and agricultural crops being grown in tropical and sub-tropical regions of India will be deliberated at the meeting.

P-2224-24

Fighting food insecurity and alleviating poverty in the face of climate change through rice-growing in Tonga-Cameroon

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This study focused primarily on the different actors involved in the rice production in Tonga (Western Cameroon) and strategies set to boost its cultivation, and it brought up some suggestions to the various problems that tend to weaken the activity. Preserving and enhancing food security requires agricultural production systems to increase productivity and to reduce output variability in the face of climate change and other agro-ecological and socio-economic risks. Cameroon, a low-income food-deficit country (LIFDC), has made agriculture a condition of its development. But the 2007's riots, coupled with the food prices soaring, deeply raise the double problem in the fight against food insecurity and poverty. The objective was to investigate the role played by the rice-growing activity in Tonga in the fight against food insecurity and poverty. Rice production in Tonga is on the rise because of its natural assets and good quality of the rice cultivated in the locality. To test our hypotheses, we used Quivy Campenhoudt and Van (2006) and Thiétart (1999) methods ranging from field investigation (enquiries to relevant stakeholders, on-the-spot assessment), sampling techniques, to data collection and processing. These methods have demonstrated that rice-growing contributes about 80% to the fight against food insecurity and alleviate poverty in Tonga. These findings could contribute to the improvement of the living conditions of rural populations in Tonga. However, to reverse the trend of rice consumption in Cameroon overall, it is necessary to move from family/traditional farming to industrial/modern agriculture on which the population could sustainably rely to improve their living conditions. The Cameroonian government through the Agricultural Sector Development Program (PADFA) provides different supports to farmers to eradicate hunger and poverty, and finally ensure a brighter future for rice growing. New challenges and technological opportunities for rice-based production systems for food security and poverty alleviation are then needed.

P-2224-25

Screening of Blackgram (Vigna mungo (L.) Hepper) genotypes for thermotolerance using Temperature Induction Response (TIR) technique

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Temperature induction response was standardized for blackgram genotypes. A total of nineteen blackgram genotypes were screened and evaluated for thermotolerance. By using standardized optimum induction and challenging temperature, cellular level tolerance using TIR protocol was assessed in all the blackgram genotypes. The challenging lethal temperature was standardized as 50˚C at which 98 per cent of the seedling mortality was noticed. The induction temperature was standardized as 36 to 40˚C at which 46.4 per cent of growth reduction over control was noticed The Based on root length and shoot height of induced seedlings over control seedlings, the cellular level tolerance in terms of least reduction in growth and highest survival percentage was calculated. Also, the physiological basis of thermotolerance was assessed by measuring the proline content and antioxidant enzyme activities. The genotypes VBG-07-001, VBG-06-010 have intrinsic heat tolerance and they can be explored as donor source in breeding programme aimed for global warming.

P-2224-26

Does diversification in smallholder coffee landscapes help farmers to adapt to climate change? Answers from Nicaragua

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Introduction: The Central American coffee production area is predicted to reduce substantially under progressive climate change. The livelihoods of many smallholders in these landscapes are threatened because they largely depend on coffee production. Despite the growing emphasis on on-farm diversification to manage climate risks and improve food security in coffee landscapes, there are no criteria developed to quantify the status, need and outreach of diversification.

Objectives: We identified with community representatives and other local stakeholders in two contrasting coffee zones in Nicaragua (dry and humid): 1) the role of on-farm diversification in farmer strategies in climate change adaptation; 2) different dimensions of on-farm diversification; and 3) the need for specific measures to make use of the potential of diversification.

Methods: We carried out a literature review highlighting the different dimensions of diversification, and for each dimension, the benefits and drawbacks of diversification for smallholders of coffee landscapes. We consulted institutions and focal groups from ten communities in two contrasting coffee zones in Nicaragua about: 1) the vulnerability of their livelihoods to climate changes ; 2) existing and desirable strategies to adapt to these changes; 3) existing diversity in coffee farms; 4) what on-farm diversification would represent for them to be an effective way of adapting to climate change. Taken into account the gender issue, we conducted interviews in farm households to understand how actual diversification is related to climate risk management and food security status, and to identify specific needs to enable farmers making use of the potential for diversification. To embed our results in local development and research processes, our activities were linked to existing farmer initiatives and the local university agronomy faculty. In each coffee zone, phenological calendars for the principal crops were developed on the basis of the collected information to support farmers´ crop management under the existing climate variability.

Preliminary results and discussion: Farmer families in both coffee zones indicated crop diversification among adaptation options that they prefer, particularly enrichment with fruit perennials like plantain, banana and citrus. These crops provide cash flow through the year and can be used also for own consumption to enrich the diets of farmer families. Though a large diversity of agricultural species is grown in the landscape, most on-farm activities are concentrated around coffee, maize and common beans and take place between May and August, which coincides with the months of seasonal hunger. This suggests a high potential for diversification which is currently little utilized to improve food security, generate income and to adapt production systems to climate variability. The literature review allows us to draw a first typology of complementarity and competition effects amongst crops. Some farmers have already enriched their coffee farms with fruit perennials and other crops. Because of their experience, they are key persons to share knowledge about benefits and risks of crop diversification with other farmers. At landscape level, farmers stressed the importance of sufficient tree cover to ensure key environmental services like water availability. Restoration and conservation activities at landscape level will require coordination among farmer s and governmental organizations.

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2225 - Climate Smart Agriculture: Propaganda or Paradigm Shift?

ORAL PRESENTATIONS

K-2225-01

From a global science conference towards UNFCCC negotiations: mobilizing science for transitions

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This presentation aims at presenting the main out comes from the 3rd Global Science Conference on Climate Smart Agriculture (CSA) in Montpellier, France, 16-18 March 2015 where more than 600 researchers and 150 stakeholders and policy makers from 75 countries and 5 continents convened. CSA is a framework that mobilizes synergies and can lead to innovative and comprehensive solutions at local, regional and global levels. Delegates also confirmed that CSA solutions exist and can be brought into reality provided favorable conditions.

Agriculture was acknowledged as a sector particularly vulnerable to climate change, which impacts the livelihoods of the world's poorest people. This places increased strain on global food systems, especially since expectations for meeting demand for food will change tremendously within the next 40 years. Agriculture has also a central role in strongly reducing greenhouse gas emissions and lies therefore at the heart of complex challenges to be addressed. CSA invites researchers, practitioners and policy makers to explore solutions combining three pillars, food security, climate change adaptation and mitigation, underpinning sustainable landscapes and food systems. This is essential since the sector is facing unprecedented uncertainty and risks: synergies have to be looked at and trade-offs addressed. Recognizing that agriculture is a pivotal sector for international negotiations on sustainable development and climate change, CSA therefore provides a framework for looking at necessary transitions.

The main recommendations were as follows: (i) agriculture in the future must also address the challenges of sustainable food systems and landscapes; (ii): based upon a renewed research agenda that addresses a more complex set of objectives, researchers and practitioners must engage to build evidence and design the trajectories for multiple transformative transitions of climate-smart agriculture; (iii) the future relies upon policy, institutional and financing decisions and particularly upon the involvement of policy makers, development agencies, civil society and the private sector with researchers and research institutions in innovation platforms.

The strengthening of CSA scientific community must be pursued and better engaged in interfacing with policy makers, promoting scientific diplomacy. Their capacity to develop relevant global research programs and joint initiatives to address as from now questions that will be key in the future should be supported and stimulated through international cooperation platforms.

K-2225-02

Title not communicated

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Abstract not communicated

O-2225-01

Decision-support framework for targeting investment towards climate-smart agriculture practices and programs

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Unprecedented impacts of climate change on agricultural systems around the world coupled with increasing food demand underlie the urgency of building a more productive, resilient, and low-emission agricultural development model – one that is climate-smart. Establishing climate-smart agriculture (CSA) systems requires investment in concrete on-farm practices and broader programs to establish implementation at scales that will transform systems to address food security and development goals in the face of climate change. The