

WORKSHOP REPORT**Climate variability and its extremes through the lens of soil and water: *Perspectives from the Northern hemisphere***

Date : 2018 June 04

Venue : Virtual (Webex)

Participants : 38 from the USA, Mexico, Canada, Costa Rica, Trinidad & Tobago & Brazil

Background

Board representatives of PROCINORTE representing Mexico, USA and Canada each submitted a collation of programmes and activities relevant to Climate Change and agriculture in their respective countries. This was subsequent to a request for considering a new task force on Climate Change. The Board of Directors of PROCINORTE at its 2017 annual board meeting recommended that the information be reviewed and discussed by country experts, towards recommending specific joint interventions. Furthermore, experts were named from each member country for discussing and developing a half day virtual session when specific priority gaps could be identified and options for jointly addressing discussed. IICA's leader of the Flagship project on Resilience in Agriculture was asked to play a lead role in coordinating the workshop.

Subsequent to feedback from the planning group, it was agreed that considering the observed changes in climate variability, and increased frequency of extreme climatic events, the workshop should attempt to identify the main issues, concerns, opportunities for soil and water quality and management in the 3 countries.

Objectives:

1. To share information on national programs, research and activities in the USA, Mexico and Canada on the impact of climate variability on soil and/or water structure health.
2. To identify potential gaps in knowledge and issues of joint concern.
3. To identify areas and modalities for potential collaboration by the 3 countries

Agenda

Monday June 04, 2018		
10:30 – 10:35	Opening and Remarks	Dr. Raúl Obando - President PROCINORTE
10:35 – 10:40	Objectives and Introduction of the speakers	Moderator: Katia Marzall, Leader of the Flagship project on Resilience in Agriculture, IICA
Country Presentation		
10:40 – 11:10	USA: Responding to climate challenges through science and service: perspectives from USDA	Dr. Marlen Eve – National Program Leader, Office of National Programs, USDA Agricultural Research Service. Dr. Jean L. Steiner - Director, Grazinglands Research Laboratory, El Reno, Oklahoma, USDA Agricultural Research Service.
Country Presentation		
11:10 – 11:40	Canada: Agroecosystem resilience to Canadian climatic extremes	Dr. Henry Wilson – Agriculture and Agri-Food Canada, Research Scientist – Hydrology and Biogeochemistry Dr. Steve Crittenden – Agriculture and Agri-Food Canada Research Scientist- Soil Science
Country Presentation		
11:40 – 11:55	Mexico- Soil: The potential of Mexican soils for carbon sequestration and mitigation of global warming and climate change effects	Dr. José Cueto – Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias - Soil Scientist Dr. Bertha Patricia Zamora – Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias - Soil Scientist M.C. Vicente Santacruz – Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias - Soil Scientist.
11:55 – 12:10	Mexico - Water: Approaches of Climate Change related research in INIFAP (water)	Dr. Ignacio Sanchez - Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias - Soil Scientist. José Villanueva-Díaz - Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias-Scientist. Gabriel Diaz Padilla - Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias - Senior Researcher.
12:10 – 13:10	Comments from the co-moderator, questions and answers	Dr. Chaney St. Martin, IICA MSc. Karen Montiel, IICA
13:10 – 13:30	Conclusions and recommendations	Moderator: Katia Marzall

Summary from presentations

USDA: Responding to climate challenges through science and service: perspectives from USDA

The focus of the presentation of USDA was on some processes, methodologies and approaches USDA Agricultural Research Service has in place, essentially through the organization of climate hubs, the US is establishing networks to approach the variety of impacts across the country.

Research on soil and water are part of the process, as one of many concerns the country has related the prognostics for changes in temperature and rainfall across the country.

Suggestions of areas of collaboration include adding to the climate hubs; Long-Term Agroecosystem Research network (LTAR Climate Hub Network; Global Research Alliance; Partnerships such as PROCINORTE.

Their proposal focuses on strategies and methodologies, that could be applied to various technical themes, however the modality for collaboration was not clear.

Canada: Agroecosystem Resilience to Canadian Climatic Extremes

Canada presented national challenges, their main conceptual framework, and listed some challenges, that could be possible areas of interaction, especially considering the experiences on soil and water management that could be mutually shared to fast-track potential solutions: best practices and trade-offs require further research attention.

Mexico: “The potential of Mexican soils for carbon sequestration and mitigation of global warming and climate change effects” and “Approaches of climate change related research in INIFAP (water)”

The focus of INIFAP’s presentation was carbon sequestration. The national context and the lines of research were shared.

The second presentation referred to water research in relation to the analysis and prevention of climate change being carried out by INIFAP. The research quantifies the impact of general circulation phenomena such as El Niño in the agriculture of the main irrigation districts in the Northern part of the country in comparison with the Southeast. The global climate information is analyzed and then taken to the level of decision making at the local level. Other researches carried out by the National Laboratory for the Generation of Paleoclimates identify the best management practices that optimize or maximize the productivity of water and the measurement of the effects of extreme events; reconstruct long-term climate variability; build historical droughts; reconstruct the volume of entrance to the dams; modeling changes in precipitation and temperature, develop agroecological adaptation curves to know where to plant, the qualities and changes in productive potential according to climate change. A diagnostic based on prognostics (all three countries are using climate models to analyze their potential future), and the impact on production areas.

No description of potential collaboration opportunities, except for questions, that came from them, regarding carbon footprints (here the issue was standardization), and studies on social vulnerability (that had not much resonance with the other two countries).

General comments from participant institutions:

- Unlike the case of Mexico, which faces challenges with producers in mountainous areas, in the case of the USA there is a challenge of small farmers that require local or municipal training program to sensitize this group in terms of management of water resources.
- Technology transfer in water issues is a continuous effort and it is important that producers act as extension or transfer agents.
- There are very different conditions in the countries not only with respect to soil structure, weather patterns, and crop production and different species, but also with respect to different social, economic and cultural structures. All of the above impacts the production systems and how these systems establish their resilience to climate change, therefore understanding the technological aspects is central to understand the dynamics of the system. Cultural and social aspects must be taken into account because it is at the end of the day where decisions are made based on the technical information provided.
- There are several challenges for promoting resilience and how to recover and re-establish systems after extreme events. Even when there are differences, there is an opportunity to share common concepts and common methodologies that could be applied in different contexts and to see how those technologies can share information in a uncertain and changing reality that we all face and how it can help us to make better decisions.
- All regions are experiencing more variability as the "new normal" not only in water management but throughout the system.
- Climatic variability is already manifesting in the main crops, principal in flowering and harvest, therefore it would be interesting to study more the phenology of the plants.

General Observations by Moderator & Co-Moderators:

- Carbon sequestration is important aspect in terms of mitigation, thus it is interesting to know the information from Mexico with respect to monitoring carbon sequestration and the spaces that can be promoted for collaboration among countries.
- There is a variety of technology, tools and research that countries have developed, in addition to the platforms they have developed to systematize and share information, which allows decision-makers to be reached in a better way.
- It is important to know the enabling conditions that favor these investigations help promote innovation processes in the countries. It is interesting to know how to bring these innovations closer to the decision makers and how each institution has managed to facilitate different links or interaction between the different stakeholders such as research centers, universities, government and farmers. It is interesting to know if these enabling conditions of each country could promote a process of collaboration between countries.
- The country presentations were all quite different, with Canada being the only country that adhered to the guide provided.

- There is potential for collaboration of sharing methodologies and there is a possible role for IICA in sharing advantages of collaboration.

Proposed next steps and recommendations

1. Host a follow-up meeting with representatives of the 3 countries.
2. Propose as follow-up to the workshop discussions the following:
 - a. Share relevant data, indicators and measuring standards, impact on productivity; potential production systems and technologies being tested
 - b. Identify regions/ecosystems of common interest for conducting observations
 - c. Invite AgMIP (or GEOGLAM) for potential role.
 - d. Elaboration of a road-map for next steps.
3. IICA's roles or contributions recommended are:
 - i. To serve as a moderator/mediator in the process of collaboration with scope and leverage of executing studies of interests in different regions or countries in the Americas.
 - ii. Serving as a platform for the managing knowledge generated by these institutions not only the results but the narratives on processes or success stories with the establishment or strengthening of institutions or systems to achieve these objectives.
 - iii. To better integrate the social, governance and policy issues into the approaches used by the research institutions, particularly as it relates to rural development, farmer decisions making, value chain analysis. A farm based analysis (more inclusive) is recommended, particularly for building not just adaptation but benchmarking and developing resilience in smaller territories.
 - iv. To help articulate the common interest or strategic lines at the regional level on the area of climate change.
 - v. To promote more effective interaction with regional innovation systems in the hemisphere, such as FORAGRO, or at the global level.