Date: 28 October 2015 - Day 1

Time: 14:00-15:30

Governance 1: Africa and Global Climate Change Governance since Kyoto – Chair, Dr. Chukwumeji Okereke

Title: Changing Face of Global Climate Negotiations: COP17 Addresses International Relations more than Environmental Concerns

Author: Prof Godwell Nhamo, University of South Africa, e-mail: nhamog@unisa.ac.za

The 17th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and the Seventh Session of the Meeting of Parties, popularized as COP17/CMP7 witnessed a rare shift in the manner in which the COP Presidency was set up. Instead of the traditional mechanism that elevates the responsible ministry and minister of environment to the COP/CMP Presidency, South Africa chose to be the 3rd country after experiments by Denmark and Mexico during COPs 15 and 16 respectively to shift this powerful office to the national Department of International Relations and Cooperation (DIRCO). The Minister responsible for the DIRCO was tasked with hosting the Conference, while the minister responsible for the national Department of Environmental Affairs (DEA) was entrusted with leading the South African delegation. In illustrating the changing dynamics of global climate negotiations, the paper seeks to gauge the distribution of responsibilities between DIRCO and DEA. The paper assesses how this operational shift aimed at achieving the dual ends of negotiating South Africa's interests and ensuring the smooth running of the international negotiation process played out on the ground leading to and from COP17/CMP7. The paper concludes that the shift in the COP17/CMP7 Presidency is a clear reflection that global climate policy negotiation regimes have evolved from the purely scientific and environmental space to international and political relations as well as the economic space.

Title: The Evolving SADC Regional Policy and Governance Frameworks in Pre and Post 2020 Scenarios for Promoting Climate Change Approaches

Author: Dr Calvin Nhira, Timothy Gotora and Hellen Njiwa, SADC Secretariat, Email: tgotora@sadc.int

A critical analysis of SADC Member States' and Regional climate change and green economy policies and response strategies, action plans, protocols, baseline studies and main regional development frameworks such as the Revised RISDP and the Industrialisation Strategy reveals an evolving and important role for the SADC Regional Policy and Governance Frameworks in the pre and post 2020 global climate change policy discourse. The paper maps the key features of the evolving policy and governance frameworks on climate change at regional level as we move towards Paris 2015 and projects into the 2015 - 2020 period based on the Draft legal agreement, the Africa Position, the SADC Regional Negotiation Consensus Positions, and draft Intended Nationally Determined Contributions from the SADC Region. Evidence on priorities, targets and gaps in the development of climate change policies and concomitant investment frameworks, stakeholder involvement, research and education needs, advocacy and information sharing, gender and HIV -AIDS mainstreaming, and adaptation and mitigation actions is presented and discussed. A society-wide deliberative and participatory approach to developing and implementing climate change policy, which is home grown and domestically resourced, but fused with international norms, standards and financing is suggested. States' capacities and commitments to deliver and a re-orientation of delivery mechanisms to be much more grassroots focused is suggested.

Title: Strengthening Africa's Engagement in International Climate Negotiations through Minilateralism

Author: Kennedy Liti Mbeva, African Centre for Technology Studies (ACTS), Email: K.Mbeva@acts-net.org

This paper analyses the possibility of strengthening Africa's engagement in global climate talks through minilateralism. Minilateralism involves a smaller number of countries with similar socio-economic characteristics joining together to take particular positions which they can efficiently lobby for in a broader multilateral process We draw from literature to explore the use of minilateralism by African countries in climate negotiations and specifically identify evidence on the same. Drawing on the findings, we point to some opportunities for Africa in pursuing minilateralism in climate engagements. Our findings reveal that there is little evidence on the utilisation of minilateral forums in Africa with regards to climate negotiations due to lack of research and policy discussions on the viability of the approach. However, there is greater potential to realise minilateralism through regional economic groupings of African countries whose similar socioeconomic characteristics enable more cohesive and focused positions with regards to global climate decisions. Further, minilateralism could accelerate Africa's influence on issues of greater relevance to its people and policies such as access to international climate funds for improved livelihoods, technology development and transfer, capacity building and information sharing. We conclude that minilateralism can complement the existing pan-African approach to climate negotiations and therefore its viability should be explored further both in science and policy domains.

Title: Getting Specific on the 2015 Climate Change Agreement: Suggestions for the Legal Text with an Explanatory Memorandum

Author: Sebastian Oberthür, Antonio G. M. La Viña, Jennifer Morgan

Since 2011, countries have been meeting regularly to negotiate a new international Climate Agreement, with the goal of adopting that Agreement at the end of 2015, at the 21st Conference of the Parties (COP) to the UN Framework Convention on Climate Change (the Convention) in Paris. Climate change is now imminent. Changes in weather patterns including extreme weather events are impacting every nation on Earth, and impacts are being felt most severely by the poor and vulnerable. Many solutions are available and being implemented, but they are not yet being deployed at the scale or speed required to accomplish an orderly transition to a low-carbon, and climate-resilient economy. The 2015 Agreement in Paris represents a critical opportunity to send unambiguous signals that the world will shift its economic and social activity toward more climatefriendly and sustainable pathways.

Climate Science 1 – Climate Change Trends and Projections – Chair, Prof. Semazzi

Title: Climate Change over West Africa: Recent Trends and Future Projections

Author: Dr. Mouhamadou Bamba Sylla, West African Science Service Center on Climate Change and Adapted Landuse (WASCAL), Email: syllabamba@yahoo.fr

West African climate have evolved in recent decades to respond to elevated anthropogenic greenhouse gas (GHG) forcing. A gradual warming spatially variable reaching 0.5 ^{o}C per decade in recent years is observed. In addition, the Sahel has recovered from the previous drought episodes (i.e. 1970s and 1980s), however, the precipitation amount is not at the level of the pre-drought period. Although these features are common across the different data sources, their magnitudes differ from one source to the other due to a lack of reliable observation systems. Projected climate change indicates continuous and stronger warming (1.5oC to 6.5^{o}C) and wider range of precipitation uncertainty (roughly between -30% to 30%) larger in the Sahel and increasing in the farther future. However, the spatial distribution unveils significant precipitation decrease confined in westernmost Sahel and becoming greater and more extensive in the high level GHG forcing scenario and by the end of the 21st century. This coexists with a substantial increase in both dry spell length and extreme precipitation intensity. West Sahel is thus the most sensitive region to anthropogenic climate change. It is also reported that the projected rainy season and the growing season will become shorter while the torrid, arid and semi-arid climate conditions substantially extend. It is thus evident that in a "business as usual" World, most countries in West Africa will have to cope with shorter rainy seasons, generalized torrid, arid and semi-arid conditions, longer dry spells and more intense extreme precipitations. Such conditions can produce significant stresses on agricultural activities, water resources management, ecosystem services and urban areas planning. However, some GHG mitigation (i.e. a mid-level forcing) could help to reduce the stresses and offer some benefits.

Title: Impact of increasing global temperature on Ghana's climate

Author: Nana Ama Browne Klutse, Ghana Atomic Energy Commission, Email: amabrowne@gmail.com

The climate of Ghana like that of other countries is changing. Earlier study over Ghana showed that, there is 1^{o}C increase in temperature over a 30-year period (1970-2000) from the historical records, increased evaporation, decreased and highly variable rainfall pattern, and frequent and pronounced drought spells. According to the Ghana's country report to the UNFCC, projections of temperature and rainfall for Ghana based on observed data from the Ghana Meteorological Agency from 1981 to 2010 indicates a likely warming and increased variability in rainfall by the year 2080. The climate in Ghana in the next few decades is projected to be hotter, with a gradual increase in the average minimum and maximum temperature. The mean temperatures are projected to increase between 1 ^{o}C and 7 ^{o}C in all agro-ecological zones by 2080 compared with the observed temperatures from 1981-2010. The observed changes in a decade for minimum temperatures are 0.54%, 0.31% and 20% for southern, middle and northern parts of Ghana respectively. Similarly, maximum temperature has higher decadal change of 0.8%, 0.6% and 29.6% for southern, middle and northern parts of Ghana respectively. The impacts of the rising temperatures are already evident. Rivers are drying in the dry season, more intensive rainfall causing flood events (especially, in 2007) in parts of Ghana that wreaked havoc on life and properties, frequent events of drought like the drought that led to power rationing in 2006, due to low levels of water in the Akosombo dam. The rising trend of projected average temperatures gives evidence that the impacts of climate change are likely to be more severe in the future. The paper discusses the impacts of the increasing global temperature on Ghana from various studies to provide policy information.

Title: Bridging climate information gap to strengthen capacities for climate informed decision-making in Africa

Author: Nicholas Ozor, African Technology Policy Studies Network (ATPS), Email: nozor@atpsnet.org

Climate change threatens to Africa's rising economic growth, long-term prosperity, and the livelihoods of vulnerable rural populations. In averting this threat, significant efforts have been made at the continental level through establishment of landmark initiatives including the Climate Change Action Plan 2011-2015, Climate Risk and Management Strategy (CRMA), Clean Energy

Investment Framework (CEIF), African Climate Technology and Finance Center and Network (ACTFCN) and a special fund "Clim-Dev Special Fund". The paper examines the dynamics of African countries' efforts to formulate and implement action plans and strategies in line with continental initiatives to build their capacity for adaptation and resilience. It became evident that the formulation and implementation of national strategies and plans are characterised by weak institutional capacities to generate and deploy appropriate climate data and information, limited availability of reliable and useable climate information, and limited understanding of drivers of climate change. This situation is reflected in the low level of priority given to climate change issues in national development planning and policy-making. Climate data and information are highly important to characterize climate risks and inform decision-making for effective risk management in social, economic and other sectors of developing economies. Equipping African countries with adequate climate information provides the opportunity to adopt a development pathway that is climate-resilient, builds adaptive capacities of stakeholders and strengthens institutions' capability to integrate information into development planning that strengthens national climate systems. Such a development pathway would potentially reduce exposure to the hazards of climate change and mitigate its effects.

Title: Climate Information Partnership for Resilience and Early Warning in Africa

Author: Dr. Richard Graham

Sustainable Development 1: Climate Change Impacts on Sustainable Development- Chair, Dr. Aida Diongue Niang

Title: Can Climate-Compatible Development Projects Create Socially Just Triple-wins? Evidence from Malawi

Author: Ben Wood, Sustainability Research Institute/ Centre for Climate Change Economics and Policy, Email: ee12btw@leeds.ac.uk

Climate-Compatible Development (CCD) aims to encourage opportunities for sustainable development in the face of climate threats without exacerbating threats for current and future generations. The concept is proving popular but, hitherto, research has overlooked the social justice implications of pursuing CCD goals. Justice requires local people to be recognised by, able to participate in, and benefit from CCD interventions. I outline the justice implications of two donor-funded projects which pursue CCD goals in Malawi; they aim to enhance household food security and strengthen resilience through engagement in climate-sensitive, low-carbon activities. Projects provide good practice lessons for facilitating justice. Well-designed tools for assessing community capabilities help match projects' scope with local development and climate adaptation priorities. Consequently, experienced project benefits are considerable, enhancing household resilience. Implementing projects through traditional leaders and community-based extension approaches empowers local people and encourage long-term benefits. However, projects in some cases exacerbate climate and development injustices. Limited land ownership, income poverty and ill-health mean already underprivileged people (resource poor, elderly, disabled, caregivers) cannot engage in resilience-building activities. Meanwhile, local elites too easily monopolise benefits. Low household education levels mean climate mitigation creates trade-offs between procedural and distributive justice. Evidence suggests that achieving justice through projects which simultaneously pursue development, climate mitigation and adaptation is more challenging and complex than through projects which pursue single- or double-wins. I conclude by stressing that CCD's operationalisation should proceed cautiously to avoid reproducing patterns of injustice.

Title: Greening the Road Sector in Kenya: prospects and policy implications

Author: Monicah Karangi, Kenya Institute of Policy Research and Analysis (KIPPRA), Email: MKarangi@kippra.or.ke

The drive towards sustainable development underpins many development initiatives implemented in the past decades across Africa. Although the road sector is widely recognized as an important avenue for delivering economic and social pillars of sustainable development, its contribution in achieving environmental sustainability is usually neglected and often doubted. This paper evaluates recent reforms in the road sector to examine their implication for green transformation in the country. A case study of Nairobi City is selected, as studies indicate that though the number of private vehicles for every kilometer of road is still lower than the global average, the mean day time concentration of particulate matter in Nairobi is 5 times higher than global standards. The situation is exacerbated by traffic congestion and large numbers of private vehicles that ferry only 22 percent of the population. The objective of the study is therefore to evaluate the government's initiatives in greening the road transportation sector, and assess the level of inclusiveness of these initiatives. A cost-benefit analysis of government initiatives as Mass Rapid Transit (MRT), shift of freight from road to rail, improved passenger and freight vehicle efficiency, and bio-ethanol blending and biodiesel use will be evaluated. Secondly, the paper seeks to identify the financing needs and financing sources, and propose innovative domestic financing instruments for greening the road transport sector. Finally, the paper will propose novel approaches for scaling-up inclusive-greening of the road transport sector for Africa.

Title: Ecosystem-Based Adaptation to Promote Sustainable Development in West Africa: Lessons, Prospects and Recommendations

Author: Muthee, Kennedy, World Agroforestry Center (ICRAF), Email: K.Muthee@cgiar.org

Climate change effects pose one of the most pressing social, developmental, and environmental challenges. West Africa, which is ranked the least developed region by the UN, continues to bear the hugest environmental and developmental burden of this phenomenon, as evidenced by perennial flooding, droughts, land conversion, biodiversity loss, desertification, inter alia. The scope of impacts of climate change cuts across all the economic sectors, making climate change both an environmental challenge and sustainable development barrier. To this end, communities and governments, in support of donor community, have initiated ecosystem-based adaptation projects to reverse ecosystem degradation and promote societal well being. This paper focuses on lessons, prospects and recommendations on ecosystem-based adaptation in Burkina Faso, Mali and Sierra Leone, based on an in-depth study and analysis of twenty National Adaptation Programme of Actions states. CRISTAL tool was used to analyze the projects and propose areas of redesigning and improvement while GIS mapping was employed to locate the project areas and land use changes over time. The study established ecosystem-based adaptation harnesses ecosystem services, reduces negative effects and pressures to the ecosystems and promotes social well being; thus promoting sustainable development. The study also profiled some of the prospects and potential of this approach based on the continental and global experiences. It concluded and recommended the need for community capacity building, policy development, increased public-private partnership and joint ventures between communities, private sector government agencies in implementing ecosystem-based adaptation projects.

Title: Regional Cooperation for Improved Water Resources Development and Management in the Nile Basin under Climate Change

Author: Dr. Abdulkarim Seid, Nile Basin Initiative, Email: aseid@nilebasin.org

Studies have indicated that changing climate will affect the Nile Basin water resources spatial and temporal availability and quality, and will bring changes to overall demand of water. Since the Nile river water is directly linked with the livelihoods of over 230 million inhabitants of the Nile Basin, these changes will likely have an overwhelming consequences on the already 'water stressed' Nile Basin as well as pose a major threat for achieving water related Sustainable Development Goals. The Nile riparian countries have been putting efforts for joint development and management of the Nile waters. This collaboration could play a key role in managing the effects of climate change, through building resilience and creating a means to utilize potential opportunities. This paper is based on the analytic work being carried out at the Nile Basin Initiative secretariat with the objective to demonstrate comparative assessment of Nile water resources system under climate change for 1) 'No-Cooperation' development scenario and 2) Scenarios of different levels of cooperation (through e.g. joint operation of reservoirs). The results indicate the potential impacts of climate change on hydropower production, irrigation development and water availability under both scenario groups. They show added benefits of regional cooperation for better adaptation capacity and enhanced resilience nationally and regionally. The purpose is to demonstrate that, in shared river basins, regional cooperation offer opportunities for enhanced climate change adaptation.

Climate Finance 1: Mobilizing domestic Resources for Climate Finance – Mr. Justus Kabyemera

Title: Mobilizing Domestic Climate Finance: Insights into Kenya's Climate Change Policy and Bill

Author: Mr. John Nynagena, Kenya Institute for Public Policy Research and Analysis (KIPPRA), Email: jnyangena@kippra.or.ke

International climate finance flow to Africa has largely been disappointing. Domestic climate sources are increasingly emerging a vital component in leveraging international flows,particularly in supporting local adaptation. Mobilized domestic resources are contingent upon the policy environment and institutional framework upon which adaptation is programmed and stakeholders incentivized to commit commensurate resources for adaptation needs.Kenya recently formulated a climate change policy and bill to guide climate actions across scales.This paper draws on the policy analysis model developed by Walt and Gilson to examine the likely effects of this changing policy landscape on mobilized domestic climate finance. Specifically, the paper examines progress in domestic climate finance and factors likely to influence effective operation of the proposed Climate Change Fund (CCF). Our preliminary results show that Kenya has provided small but increasing public finances for both mitigation and adaptation, although the amount is inadequate to bridge the cost of climate change. We argue that the institutional architecture proposed in the climate change bill has a number of challenges: a separate modality prevents 'mainstreaming', it lacks a track record, and has no guarantee for the private sector participation as well as that of the county governments. In order for the CCF to be effective, it should have four main characteristics; accountability, strong coordination, and capacity to demonstrate the benefits of climate investment. These findings would help other African countries contemplating legislating on climate change.

Title: Expanding Domestic Climate Financing Options to Compliment International Climate Finance: Emerging National Climate Funds in Africa

Author: Mr. Huzi Ishaku Mshelai, Clean Energy Consult, Email: hmshelia2@gmail.com

Is all the monies being pledged worth all the efforts put in the negotiations for Africa? With some of the fastest growing economies in terms of GDP and a boisterous population and strong emerging private sector, the above question becomes relevant

to most African countries in the on-going UNFCCC negotiations leading to Paris 2015. The Copenhagen Fast Start pledge, the mobilization of the $100bn by 2020, the establishment of the Green Climate Fund and other sundry promises to international climate finance have remained substantially unfulfilled while Africa remains highly vulnerable to the impacts of climate change. Domestic national options are becoming very attractive as most viable option to compliment international climate finance and leverage on domestic resources however small, to address high risks issues on the short term. Lessons emerging from Rwanda, Mali and Ethiopia where domestic national funds were established to compliment CF are encouraging and deserves further interrogation. Available resources from the fast growing Corporate Africa, diaspora remittance, extractive industries and rationalized capital expenditure are indicative of the diverse sources that these national funds can be supported and funded. These funds can also be better managed since close monitoring of the "people's monies" can be well assured. As Paris 2015 sets to adopt the IND Contributions, it is obvious that Africa must device better funding options rather that continue to rely on the unsustain CF which has remained dependent on unending diplomatic uncertainty.

Title: Reflexion sur les Mecanismes de Financement de l'Investissement et de l'Exploitation de Systemes de Production Agricole Resilients au Changement Climatique

Author: Dr Saliou Ndoye, Senegal, Email: saliou44@gmail.com and Ing. Mohammed S.BOULAHYA, Independant Regional Adviser Africa in Climate for Development, Email: msb_africa@yahoo.com

Partant d'une revue sur les M?canismes accessibles aux pays de l'espace CILSS/CEDEAO pour financer l'Agriculture Innovante dans un Climat Changeant(AIC), quatre grands types de bailleurs ont ?t? identifi?s:les Pays (Pays CEDEAO), les Banques d'appui au d?veloppement (BOAD, BIDC, BAD, BM), les m?canismes de financement des AME (FEM, FA, FEVC) et les coop?rations bilat?rales (FED, USAID, AFD).Pour une mise en oeuvre effective, innovante et efficace de l'AIC, deux d?fis majeurs doivent ?tre lev?s : en premier lieu celui de la gouvernance, avec notamment la faible capacit? des pays (? travers leurs repr?sentants et leur mode d'organisation) ? comprendre et ? exercer leur pouvoir face aux bailleurs de fonds, et en second lieu celui de la faible capacit? des pays ? d?velopper des projets et programmes ?ligibles au financement des diff?rents fonds d?di?s. Une mise en oeuvre diligente de l'AIC devrait permettre de profiter d'un environnement international assez favorable et la prise de conscience nationale renforc?e pour assurer une plus grande r?silience de l'investissement et des syst?mes de production dans le secteur de l'agriculture a titre pilote. A ce titre trois recommandations sont formul?es: 1.Pour financer l'AIC dans les Plans Nationaux, les ?tats et leurs banques de d?veloppement en collaboration avec les entit?s r?gionales appropri?es, devront d?velopper un portefeuille des projets et programmes de l'AIC. 2.Pour am?liorer l'environnement du financement de l'AIC, les Etats en rapport avec les structures r?gionales appropri?es, devront davantage prendre part aux instances d?cisionnelles pour ainsi pouvoir influencer en leur faveur les processus d'allocation des ressources les concernant. 3.M?canismes de financement de l'investissement et Transfer du Risque(assurances) sont a mobiliser en priorit? au niveau national pour s'approprier le processus de r?silience.

Title: Delivering the World's First Demonstrable Community-Led Mangrove Blue Carbon Project for Climate Change Mitigation and Adaptation

Author: Dr. Kairo James G., Kenya Marine and Fisheries Research Institute, Email: gkairo@yahoo.com

Mangroves and associated ecosystems, collectively refereed to as blue carbon, will play an important role in mitigating global climate change thanks to their significant capacity to capture and store huge stocks of carbon. In principle, mangrove reforestation and the avoided deforestation and degradation of mangroves (REDD) have the potential to generate carbon credits through the establishment of a registered carbon offsetting project. The sale of these credits onto carbon markets can bring significant project financing and greatly increase the financial value of these habitats. With the registration of Mikoko Pamoja project (http://www.planvivo.org/projects/registeredprojects/mikoko-pamoja-kenya/), Kenya became the first country on earth to trade in mangrove carbon under the voluntary carbon market scheme. Mikoko Pamoja is verified under the Plan Vivo system and standards - a framework for supporting communities to manage their natural resources more sustainably, with a view to generating climate, livelihood, and ecosystem benefits through payments for mangrove ecosystem services (PES); in this case carbon. Protecting mangroves through Mikoko Pamoja not only mitigate impacts of climate change, but more importantly enhance income for communities whose livelihood is tied around mangrove ecosystem. Over the expected 20 years crediting period Mikoko Pamoja would have offset excess of 60,000tCO2-equivalent. Through national and regional projects Mikoko Pamoja is being upscaled in other sites in Kenya and Africa. Prospects and challenges of implementing carbon-offset facility using mangroves will be discussed.

Gender 1: Gender and Vulnerability to Climate Change –chair, Mrs. Thokozile Ruzvidzo

Title: Are Women Victims of Climate Change? The Case Of Samburu Pastoralists in Northern Kenya.

Author: Ms. Hyrine Gesare Munga, Auckland University, Email: hmun521@aucklanduni.ac.nz

For millennia, Samburu pastoralists have been coping with climate variability but that is not possible anymore. Because of their natural resource-based livelihoods, building resilience against climate change impacts is like winning a lottery. We investigated

impacts of climate change on natural resources of the area, gender specific adaptation strategies including challenges and opportunities. The survey involved 180 respondents who were randomly selected but stratified according to age and gender from five community ranches. Focus Group Discussions, key informant interviews, life histories, specified transect walks and digital photography were used to clarify and triangulate the questionnaire study. The study revealed that 98.9% of the community was aware of climate change with extreme floods and droughts reported as the most observed changes. The study also reported that females use natural resources more than males due to gender roles thus were more vulnerable to impacts of climate change compared to the males. However, despite their vulnerability, females were found to be more innovative with diversified adaptation strategies than males. They engaged in small businesses, poultry, apiculture, charcoal burning, brewing and small scale crop farming .Men on the other resulted to negative coping strategies like drinking and violence. The findings of this study disagrees with most gender studies that paint women as victims of climate change. The study concluded that despite political and economic marginalization, inappropriate development policies, increasing resource competition and continued conflicts in the region if women are included in climate change adaptation policies and strategies,then a resilient pastoralist community is possible.

Title: She Sparks: Women's Role towards a Just Energy Transition in East Africa

Author: Ms. Joanna Patouris, Women's Environment and Development Organization, Email: joanna.patouris@gmail.com

As climate change has intensified,its crosscutting impacts have proven that it will be an equal opportunity destroyer,eroding efforts towards sustainable development and poverty alleviation,bringing adaptation and mitigation initiatives to the top of Pan-African political agendas. Women,"through their roles as community leaders,farmers, entrepreneurs, producers,and household managers",are disproportionally affected by the burdens of climate change, investing in the capacity and knowledge of women for a holistic and inclusive approach to adaptation and mitigation initiatives will ensure that both women and men benefit through the process.As many African economies are in a transformative phase of growth,efforts made towards development should be inclusive and gender-just,ensuring that the wellbeing of people and the health of the environment are at the core of socio-economic development initiatives. This paper will explore the energy sector of East Africa, emphasising the importance of gender responsive adaptation and mitigation initiatives,making the case that men and women's differentiated energy needs should be identified and incorporated in all efforts to cope with the impacts of climate change. Biomass as a predominant source of fuel for energy across Africa will be investigated to identify the challenges that communities are facing when technologies and practices are not gender responsive.This paper will also highlight successful cases of the Partnership on Women's Entrepreneurship in Renewables (wPOWER) and the Community-based Watershed Management initiative, that exemplify untapped potentials of women's engagement for environmental and socio-economic benefits.Finally,the role of women as gender equality advocates in international climate change policy will be explored,alongside the current status of African women's participation in the UN climate negotiations

Title: Femme Congolaise Face A L'eau Sous Contrainte Climatique

Author: Prof. Jean-Pierre Beya Dibue, Institut Sup?rieur des Techniques M?diclales de Kinshasa (Universit?), Email: berif2002@yahoo.fr

Les changements climatiques ont un impact sur les ressources en eau. Impact allant de la diminution de la quantit? et ? la d?gradation sa qualit?. Dans la soci?t? CONGOLAISE, les femmes sont les principales utilisatrices de l'eau, puisqu'elles prennent en charge des t?ches domestiques. Avec leurs filles, elles vont chercher de l'eau sur de longues distances s'exposant ainsi ? toute sorte d'ins?curit? de viol ou de vol. Sous contrainte climatique deux ph?nom?nes peuvent ?tre pr?visibles : premi?rement : la S?cheresse qui entraine le dess?chement des ressources en eau. Dans ce cas, l'eau potable devient rare, ceci am?ne les utilisateurs, plus particuli?rement les femmes, ? parcourir de longues distances pour s'approvisionner en eau avec tous les risques cit?s ci-haut. Deuxi?mement les inondations : pendant ce temps la qualit? de l'eau potable sera d?grad?e par les mati?res organiques et autres polluants provenant de lessivage du sol. Une ?tude de simulation de l'impact de changement climatique sur les ressources en eau en RDC avec le logiciel MAGICC-SCENGEN 2.4 a montr? qu'? l'horizon 2050 la RDC ne connaitra pas la stress hydrique, contrairement ? ces voisins, mais plut?t la perturbation de la qualit? de l'eau due aux inondations intenses. Dans le milieu urbain, o? il y a le r?seau de distribution d'eau potable, le co?t de production d'eau augmente.Dans le milieu Rural les femmes recourent aux savoirs indig?nes comme l'utilisation de MORINGA, plante ? vertue m?dicinale qui purifie l'eau.

Title: Genre et changement climatique au Togo

Author: Dr. Djahini-Afawoubo Doss? Mawussi, University of Lome, Email: dossedjahini@gmail.com

Les populations les plus vuln?rables et les plus marginalis?es sont les plus confront?es aux impacts du changement climatique qui affecte in?galement les diff?rentes couches de la soci?t? notamment les hommes et les femmes. Etant donn? que la pauvret? touche beaucoup plus les femmes que les hommes, et qu'il y a une pr?dominance des valeurs patriarcales dans les soci?t?s africaines, les femmes disposent de plus faibles capacit?s ? faire face aux impacts du changement climatique. De plus, elles constituent une proportion importante des agriculteurs et pratiquent une agriculture pluviale fortement d?pendante des pr?cipitations. La question principale du pr?sent papier est la suivante : par quels m?canismes les changements climatiques

peuvent-ils affecter diff?remment les hommes et les femmes au Togo et comment peuvent-ils accentuer les in?galit?s genre? L'objectif principal poursuivi est d'identifier les canaux par lesquels les changements climatiques peuvent cr?er et accentuer les in?galit?s genre au Togo. Plus sp?cifiquement, il s'agit d'analyser les in?galit?s genre (i) en mati?re de pauvret? ; (ii) en mati?re de pouvoir de n?gociation et d'acc?s aux ressources agricoles (notamment la terre) ; et d'identifier les actions n?cessaires pour rendre les mesures d'adaptation sensibles au genre. Pour atteindre ces objectifs, la m?thodologie adopt?e a consist? en une revue documentaire compl?t?e par des statistiques descriptives. Les r?sultats pr?liminaires indiquent de fortes in?galit?s genre en mati?re de pauvret? et d'acc?s aux ressources agricoles au Togo. Ces r?sultats impliquent que les mesures d'adaptation aux changements climatiques doivent ?tre sensibles au genre.

Date: 28 October 2015 - Day 1

Time: 16:00-17:30

Climate Finance 2: Innovative Financing for Climate Change Mitigation and Adaptation – chair, Ms. Marcene Broadwater

Title: Public Procurement for Climate Change Mitigation: Fostering Eco-Innovations for Climate Change Moderations/Adaptations in Africa

Author: Mr. Gordon Monday Bubou, National Centre for Technology Management, Email: gbubou@gmail.com

Anthropogenic pressures inflicted damage on the environment in sub-Saharan Africa has become increasingly evident in ways such as: loss of arable lands due erosion; salinity, desertification, deforestation; loss of biodiversity; loss of aquifers; sea surges in coastal areas; urban and perennial flooding and etc. This situation will be significantly exacerbated by increase in extreme weather events and climate variability. Governments and other interests groups the world over are taking steps to either mitigate the impact or adapt to climate change. Even though, the primary objective of public procurement is to provide public administrations with the goods and services required for the efficient performance and delivery of public services, on the other hand, it is increasingly associated with being a lever of social reform. In fact, the sheer size of public expenditure makes it a powerful tool to further other policy objectives of governments. For instance, the Lisbon Treaty of 2010 identified the need to incorporate social and environmental aspects of public procurement. Accordingly, the UK government incorporated aspects of societal benefits and measure aimed at minimising damage to the environment in her public procurement policy. We therefore advocate for public procurement policies for climate change to foster eco-innovations in African countries as a strategic policy response to moderate human-induced climate change contribution emanating from the continent, as well as for adapting to climate change. Consequently, for develop a strategic policy framework of public procurement for climate change.

Title: Climate Financing in UNFCCC negotiations

Author: Mr. Tosi Mpanumpanu

Title: Innovative financing for Climate Adaptation in Africa

Author: Ms. Chinma George, HEDA Resorce Center, Email: chinmageorge@gmail.com

Climate change is indeed one of the greatest threats of the 21st Century. The warming of the Earth has brought upon all, the prevalence of heat waves and diseases, increased flooding, desertification, drought and sea level rise. Africa is one of the continents at high risk due to its low adaptive capacity. Adaptation measures such as early warning systems and coastal zone management to counteract rising sea levels, proffer an opportunity of minimising climate change impacts, but Africa's capacity to adapt depends critically on access to funding. The African Development Bank estimates the cost of adaptation to be $20-$30 billion per annum for the next 10-20 years. Apart from the $100billion Green Climate Fund GCF yet to start operation and the Kyoto Protocol's Adaptation Fund financed through a 2% levy on Clean Development Mechanisms proceeds. The major source of financing for adaptation projects is the Official Development Assistance ODA. The access to funding is critical for growth and development as funds meant for development are being diverted to cope with climate change. This paper examines prospects for innovative financing through the allocation of tax on the aviation sector ; first class, business class tickets, private jet owners and the use of African Risk Capacity Insurance established by the African Union, which aims to channel investment into adaptation activities to safeguard communities from drought and other climate change induced impacts.

Title: Microfinance Opportunities for Climate Adaptation in the Sahel

Author: Mr. Ousmane Traore, National Pingtung University of Science and Technology, Email: ousmantra711@gmail.com

Climate change is an immediate threat for Sahel economic development. In this context, the microfinance service (MFS) is a potential opportunity that can help the most vulnerable local communities to robustly adapt to climate vagaries. Therefore, the present study has for objective to analyze microfinance opportunities that best fit and support climate resilience and adaptation interventions in three different countries including Burkina Faso, Mali and Niger. For this study, important data were collected

from these countries including risk portfolio, gross yield portfolio, profit status, risk coverage, microenterprises start-ups, profit margin and percentage of female loaner. A SWOT (strengths, weaknesses, opportunities, and threats) analysis was conducted to assess change and impacts occurring on small farmers with climate change. The overall results showed that high percentage of small farmers (96%), i.e. women whom received micro-credit were able to temporally cope with climate negative effects, as they were able to build responses to face climate threads, and also support their household. The results attested that when providing financial assistances to these group collectively or individually, the microfinance institutes (MFIs) create an enabling opportunity to secure basic assets and build capacities which are needed to reduce climate risk vulnerability. The comparative results also showed that a special rural micro-credit scheme is an effectual opportunity for supporting small-scale farmer's adaptation actions in these three countries. However, variable like climate risk portfolio, scale of borrower and gender aspect are key determinant in micro-credit finance reimbursement by farmers when supporting adaptation program in Sahel.

Sustainable Development 2: Climate Change Impacts on Sustainable Development – chair, Mr. Washington Zhakata

Title: Sustainability: A Missing Dimension in Climate Change Adaptation Discourse in Africa?

Author: Dr. Sandra Bhatasara, University of Zimbabwe, Email: sandrabhatasara@gmail.com

The climate change adaptation field has evolved considerably in recent years. Important contributions have been made, with scholars developing methods for assessing vulnerability in different countries and communities, documenting broad strategies for adaptation, and identifying opportunities for and barriers to adaptation as well as ways to enhance adaptive capacity. Issues of sustainability are, however, not readily argued and embraced. Predominantly, our analysis exposes that current adaptation discourse, particularly in Africa, offers a narrow framework of sustainability. The paper argues for a clear framework of sustainability in adaptation discourse which encompasses awareness to contextual aspects in responding to climate variability and change as well as resilience aspects in conceptualising and planning adaptation processes. The paper also calls for an expansion of the knowledge base around the concept of 'climate-smart agriculture', towards effectively incorporating sustainability aspects in climate change adaptation discourse.

Title: Applying the 2015 Climate Agreement Outcomes to Further Sustainable Development Objectives in Africa

Author: Ms. Belynda Petrie, OneWorld Sustainable Investments (Pty) Ltd, Email: belynda@oneworldgroup.co.za

Africa's voice on climate change continues to strengthen in the multilateral climate negotiations. However, the emphasis in the climate regime is shifting as the global climate problem increases; Parties to the UNFCCC are moving in the direction of staggered emission reduction responsibility by all, according with principles of Common but Differentiated Responsibility (CBDR). COP 21 in Paris, 2015 intends to reach a new Agreement on Climate Change. This will be co-informed by intended mitigation contributions from all party countries through submissions of Intended Nationally Determined Contributions (INDCs). Although many African countries intend these contributions to be voluntary, progress will be monitored and verified and is likely to be linked to climate finance and adaptation intervention benefits. Diplomatic relations is a further driver for 'compliance'. However, achieving sustainable development objectives in terms of national plans and the imminent Sustainable Development Goals (SDGs) takes the discourse beyond compliance. Developing countries stand to gain more from making the most of related opportunities than from not proactively pursuing low carbon development or green growth pathways. Creating jobs and stimulating the development of new enterprises by increasing Africa's share in the global environmental goods and services (EGS) market is one example: governments are increasingly seeking to share the environmental burden with industries and businesses around the world. This in turn places pressure on business to maintain a licence to operate, emphasising their need to maximise resource consumption and minimise pollutants. EGS opportunities emerge and should be incentivised as being integral to low carbon value chains and to achieving national and global sustainable development. These outcomes will further Africa's voice in future negotiations.

Title: Greenhouse Gas Emission Mitigation And Agriculture, Trade-off Or Win-win Situation: Bioeconomic Farm Modelling In The Sudanian Area of Burkina Faso

Author: Ms. Tiertou Edwige SOME, West African Science Service Centre on Climate Change and Adapted Land use (WASCAL), Email: someedwige09@yahoo.fr

Agriculture contributes to carbon mitigation by storing more carbon in the soil through greener cropping systems. A growing number of research projects have started to investigate how developing countries agriculture can contribute to these objectives. The clean development mechanism (CDM)proposed in the Kyoto protocol is one particular policy instrument that incites farmers to mitigate the GHG balance towards more sequestration and less emission. Some economists such as Michael Porter (1991) and Porter and Linde, (1995)think that environmental regulation lead to a win-win outcome. If it is a trade-off between incomes and the environment, subsidies are required. The study aims to assess whether this measure will imply a trade-off between environmental and economic objectives or a win-win situation. I apply this study to the case of small farmers in Burkina Faso using a bioeconomic model, in which the farmers maximize their utility. The study finds that the limitation of emissions in annual

crops production involves a trade-off by impacting negatively their net cash come. But the integration of perennial crops in the farming system improves farmers' utility. Around 6,118 kg are sequestrated individually. By computing the value on this carbon balance, farmers' net cash incomes go better. Then practicing agroforestry is a win-win situation, as they reach a higher level of income, and reduce emissions. Policymakers must encourage small farmers to integrate perennial crops in their annual crops system. Most of small farmers are living below the poverty line. Limiting emissions will get worse their life conditions. To reduce emissions in annual crops system, subsidies are needed to compensate the income lost through the CDM.

Title: Prospects for Sustainable Timber Harvesting for Economic Development under Climate Change: Evidence from Congo Basin Countries

Author: Prof. Ernest L. Molua, University of Buea, Email: emolua@cidrcam.org

Forest as stocks, sinks and sources of carbon occupy prominent place in global politics particularly in the Kyoto protocol of the Framework Convention on Climate Change. The Congo Basin countries are endowed with widely recognized forests that play an important role in the global carbon cycle by sequestering and storing carbon. However, for these countries with are signatory to the UNFCCC, harvesting and exporting timber is an important avenue to raise resource to catalyse economic development. The impact of climate change on harvest and supply of major timber species for five countries in the Congo Basin is investigated. A bioeconomic model for determining the optimal timber harvest and Forest Land Value with both carbon and timber benefits extended to include the risk of global warming. Information from this model is then used to determine optimal harvests, land value, carbon supply and timber supply as a function of climate change and the price of carbon. The results indicate that global warming reduces timber harvests and supply, and this reduction is greater for higher carbon prices. These results suggest that timber harvests and supply would respond more to a carbon market when the level of warming is relatively high. The findings provide scientific basis to guide the transition to a post-Kyoto climate governance framework and sets the basis for Congo Basin countries to develop climate sensitive development policies in the post Paris period.

Climate Change and Agriculture 1: Agricultural Adaptation – Mrs. Olushola Olayide

Title: The Influence of the Madden-Julian Oscillation on Large Daily Precipitation Events in West Africa

Author: Mr. Awolou Sossa, The City College of New York, Email: ssilvere48@gmail.com

The Madden-Julian oscillation (MJO) is a global-scale disturbance that originates over the Indian Ocean and propagates eastward, occasionally circumnavigating the Equator. Although it is known to modulate weather and extreme events throughout the tropics, relatively little attention has been paid to its impacts in West Africa, perhaps because it is nearing the end of its life cycle by the time it arrives there. This study focuses on the modulation of West African precipitation by the MJO especially near the Guinean coast, where variations in short-term extreme rainfall events that cause flooding that damages crops and infrastructure are more important than variations in total seasonal precipitation. Using composites based on various thresholds of daily precipitation amounts, variations associated with the MJO's phase are presented. Mean precipitation is enhanced during MJO phases which show upward motion over western Africa, and suppressed during phases with downward motion. Similarly, a two-one modulation of the likelihood of extremes (e.g., rainfall rates above the 90th percentile) occurs across these phases. Predictability of extreme rainfall with lead time 2-3 is thus implied.

Title: ICT-Mediated Adaptation Information for Improving Livelihood Resilience of Smallholder Farmers

Author: Dr. Berhane Gebru, FHI 360, Email: bgebru@fhi360.org

The livelihoods of the Ugandan population are threatened by climate variability and change, which is manifested in escalating droughts, floods, and variability in the seasons. The cattle corridor, which covers 40% of Uganda's land, is prone to recurrent droughts and is one of the most affected areas in the country. Farmers receive little or no relevant information to help them cope with droughts and other climatic stresses. Using Information and Communication Technology (ICT) tools in local languages, the Climate Change Adaptation and ICT (CHAI) project provided adaptation information to over 100,000 farmers through interactive FM radio broadcast, text messaging, email and face-to-face meetings in three intervention districts including: seasonal weather forecasts and agricultural information localized to sub-county level; weekly livestock and crop market information to help them decide what, when, where and how much to sell; guidance on low cost rainwater harvesting techniques; drought and flood coping mechanisms; and termite control measures. Midline and endline surveys, involving 677 (midline) and 641 (endline) households, were conducted to assess changes in household's adaptive capacity over time. The studies showed that access to adaptation information improved by up to 48% in the intervention districts (Nakasongola, Sembabule and Soroti) compared to the control district (Rakai); effectiveness of adaptation actions employed based on information received through the project improved by up to 33% in the intervention compared to the control district. The studies showed that the use of timely and locally relevant adaptation information reduced crop loss and damage by 40% to 65% in the intervention districts compared to the control.

Title: Maladaptation to climate change because of institutional incompatibility? Empirical observation of Hamer Pastoralists in Ethiopia

Author: Mr. Misginaw Tamirat Arficho , Jimma University, Email: misgina.tamirat@gmail.com

Climate induced livelihood changes can increasingly be observed in the pastoral system of Ethiopia. Despite progresses in understanding farm household's adaptation process, there is still limited knowledge regarding what explains decisions of indigenous pastoral communities to adapt to the impacts of climate change. The presentation highlights role of the National Adaptation Programs and development policies of the Ethiopian government, by relating it to practical adaptation actions of the community. Using multistage sampling procedure, the empirical data was collected employing Participatory Rural Appraisal techniques between February-April 2015 in Hamer district of southern Ethiopia. We show that adaptation measures are determined by local norms, previous experiences, affordability, and sustainability of the measure. The decision is greatly influenced by incentives embodied in traditional rites of passage that the communities perform. Further, there seems to be a mismatch between the 'settlement oriented', market based approaches, and norms of the community that historically secured their survival. These contradictions, besides leading to inertia and waste of resources, are leaving the pastoralists with short term, survival oriented, and costly reactive actions. This finding could be explained by institutional incompatibilities which become apparent when formal rules of adaptation fail to conform to the communal norms, so that opportunistic behavior emerges. In conclusion, the pro-farming development approach, which seldom considers role of traditional institutions, is leading efforts of the indigenes ultimately to maladaptation. These findings may contribute to designing processes that take on board institutional architecture and communication practices in a way that actually supports decision-making to climate change and sustainable development in pastoral context

Title: Applying APSIM for a Sorghum-Cowpea Intercrop System

Author: Ms. Vimbayi. G. P Chimonyo, University of KwaZulu Natal, Email: vimbayic@gmail.com

Increasing water scarcity due to climate change poses a significant threat to crop production in southern Africa. Intercropping can improve crop productivity under water-limited conditions; however, limited information exists to support its adoption. In such instances, crop models can be used as decision support tools to complement data from field trials. The Agricultural Production Systems Simulator (APSIM) model was used to develop best management practices for improved water use efficiency (WUE) and yield for a sorghum - cowpea intercrop system for 10 year simulations across five agro-ecologies. Planting dates, fertiliser rates, plant population and irrigation were considered. Simulations showed that, in water-limited environments, intercropping improved yield (29%) and WUE (19%). Under rainfed conditions, early planning was associated with high WUE. Adding fertilizer improved both yield and WUE of sorghum-cowpea intercrop by 59% in high rainfall environments. Across all environments, sorghum and cowpea plant populations of 39 000 and 13 000 plants ha-1, respectively, increased yield (26%) and WUE (35%). Deficit irrigation was an effective irrigation strategy and resulted in yield (12%) and WUE (11%) improvements. Model simulations showed that APSIM can be used to develop best management practices to assist in developing guidelines for improving productivity of intercrop systems and water, especially within semi-arid cropping systems.

Climate Science 2: Understanding Climate Change Impacts– Chair, Prof. B. Nyenzi

Title: Impacts of Climate Change on the Performance Metrics of a Water Resource System: A Case Study of Boura Reservoir in Burkina Faso

Author: Dr. Fowe Tazen, International Institute for Water and Environmental Engineering, Email: tazen.fowe@2ie-edu.org

In developing regions like Africa, availability and access to freshwater largely determines patterns of economic growth and social development. Burkina Faso, as others Sahelo-Sudanian countries pledged for some decades to control water resources after the severe droughts (1970s and 1980s) through the construction of small reservoirs. These reservoirs are used for multiple purposes with especially irrigation in order to increase food production. This study aims to assess the performance metrics of the Boura reservoir under the climate change conditions. The methodology was organized in steps: (i) Firstly, climate changes over the period 2071-2100 relative to the reference period 1971-2000 were projected by using the outputs of climate model RCA4 under two emission scenarios (RCP4.5 and RCP8.5); (ii) Secondly, the impact of climate change was investigated on the inflows of the Boura reservoir for the future period and also on the crop water requirements; (iii) Thirdly, the simulation of reservoir performance in the delivery of agricultural water demand was implemented by using WEAP model. The analysis of the inter-annual average changes in rainfall and potential evapotranspiration (PET) between the future period and the reference period showed upward trends with increases up to +8% for rainfall and +9% for PET, dependent on the RCP emission scenarios. Higher inter-annual variability of inflow into the Boura reservoir was projected for the future periods. In terms of overall performance, reliability and vulnerability metrics decreased in the future relative to the reference period, especially for the socio-economic development scenario with an increase in agricultural water demand.

Title: Analysis of Future Climate Scenarios over the central Uganda cattle corridor

Author: Mr. Nimusiima Alex, Makerere University, Email: animusiima@gmail.com

The study employed a Regional Climate Model (RCM), Providing Regional Climates for Impact Studies (PRECIS), to examine the future climate scenarios over the central Uganda cattle corridor districts of Nakaseke and Nakasongola in the near future (2021-2050) and mid-century (2051-2080). The study was guided by two questions: what are the projected temperature and rainfall values for the central Uganda cattle corridor in relation to IPCC Special Report on Emission Scenarios (SRES) A2 and A1B Scenarios for the same periods; how do they compare with the new set of scenarios known as Representative Concentration Pathways (RCPs) in the same area for the same period? The scenarios were obtained using PRECIS software and delta methods using R software according to the AGMIP protocols for SRES and RCP; respectively. Results show both SRES A2 and A1B projecting temperature increases in average monthly, seasonal as well as annual for both near future and mid century periods with A2 showing a mean annual temperature increase of 2.5 to 4.4?C in the near future and 4.5 to 6.0?C in the mid century relative to the 1981-2010 average compared to A1B which shows annual temperature increase of 0.7 -1.7?C in the near future and 1.7-3.5?C in the far future. The same trend is observed for RCP 4.5 and RCP 8.5 but the increments are lower for the RCPs compared to the SRES. Projections for rainfall show a slight increase in annual rainfall in both SRES and RCPs. However more rainfall is projected for the second rainfall season of September to November compared to the usual known season of March to May (MAM). The projections also show a shift in rainfall with the usual dry season of December to February (DJF) now becoming wetter than the 1980-2010 average. This shift is consistent in all the scenarios and has also been observed in other studies done in the region.

Title: Historical trends of monthly and annual precipitation in Zimbabwe from 1905 -2000

Author: Ms. Charity Changoroma, Ministry of Agriculture, Mechanization and Irrigation Development, Livestock Production Division, Gweru, Zimbabwe, Email: chachangoroma@gmail.com

Indices of climate extremes are an important component of climate science. The Expert Team on Climate Change Detection of Extreme Indices has developed precipitation and temperature indices after the publication of the Intergovernmental Panel on Climate Change First Assessment Report. However, not much research in extremes has been done in Zimbabwe. Such indices are critical in identification of climate hot spot areas and climate change detection and attribution. The indices developed for such purposes have to cover long time periods. The following rainfall indices have been used in the classification of the soils of Rhodesia (now Zimbabwe): mean monthly and mean annual rainfall; highest rainfall in any one month and highest total rainfall in any one year and also the lowest rainfall in any one month and lowest total rainfall in any one year for the period 1899 to 1963. Such indices have however not been updated since then. In order to update this data base, we characterise the above indices in addition to annual anomalies for the period 1905 - 2000 using 16 meteorological stations in Zimbabwe. The statistical analysis of trends in the indices was done for those stations with no missing data. The study reveals a non significant decreasing trend in annual rainfall anomalies; the trends in monthly maximum and minimum are however inconsistent. Stations with either decreasing or increasing trends need to be explored further using other variables of extremes as they might be hot spot areas.

Title: The ethics of climate services

Author: Prof. Bruce Hewitson

Climate Change and Energy 1: Bio-energy and energy transition – chair, Mr. Simon Zadek

Title: Production of biogas from animal manure for rural households

Author: Prof. Muna Mahjoub Mohamed Ahmed, institute of environmental studies, university of khartoum, Email: munamm789@yahoo.com

The target area was West Kordofan of Sudan located between latitudes 11.15 and 16.45oN and longitudes 27.05 to 32^{o}E. It covers an area of about 245,000 km^{2}, with high animal wealth. The area suffers from illicit woodcutting and deforestation. The study investigated the impact of using biogas as an alternative energy at some villages on kitchen health environment and manure accumulation risk hazards. A questionnaire was designed for 361 households'. To collect information such as: distance travelled to collect fuel wood, quantities of fuel wood daily consumption, time spent in cooking in addition of kitchen inside and outside environment situation etc.15 Domestic biogas unit were installed intended to convert livestock manure into biogas and slurry which is a good fertilizer. The biogas was used in cooking and lighting. Calculation was carried out to predict the amount of methane emissions that could be reduced in one year due to switching from traditional biomass resources to biogas to improve safety energy supply. The results obtained showed that women were the most responsible in fetching fuel wood then men and children. Fetching of fuel wood was done mostly on foot, and lesser extent using donkeys and then cart. The impact of biogas technology application was reflected on the time spent in fuel wood collection which was reduced to zero. Similarly time spent in cooking main meals was reduced to half, whereas time to prepare tea was reduced to a few minutes. The Environment inside the kitchen became healthier due to using non-smoke energy alternative also risks hazards due to manure accumulation were greatly reduced. Women are now working better environmental condition and with minimum working load. It was also shown that these 15 units biodigesters could reduce 56 tCO2/year contributing in reducing green house gas emission.

Title: Biofuels, Ecosystem Services and Energy Access in Malawi and Mozambique

Author: Dr. Francis X. Johnson, Stockholm Environment Institute (Africa Centre), Email: francis.johnson@sei-international.org

Liquid biofuels in the transport sector have been promoted as a means to stimulate rural development while also addressing energy security and climate concerns. There are also opportunities to use them for improving energy access such as in the use of ethanol stoves to replace charcoal or woodfuel. Considering especially the land use emissions associated with charcoal, the use of bioethanol should have quite positive climate benefits. At the same time, biofuels affect other ecosystem services and these impacts, positive and negative, should be incorporated into the analysis. Water, nutrients, and cultural issues are also among the affected services as well as fuel provision and climate regulation. This paper provides some preliminary results from a comparison of case studies in Malawi and Mozambique on the use of bioethanol in the household sector using a broader ecosystem services lens. Households do place a certain value on the improvements brought by substituting ethanol for charcoal or woodfuel, although this value is not always well-correlated with valuation of the ecosystem services from which they are benefitting. Revealed Preference and Stated Preference analyses in the two cases suggest that the value is highly income-dependent. Some further investigation on the implications of location-specific interfaces across the bioenergy supply chain could better clarify the feasible valuations.

Title: Liquid Biofuels Sector in Africa - Opportunities for Abating Poverty-Related Climate Change

Author: Prof. Thomson Sinkala, Biofuels Association of Zambia, Email: tsinkala@gmail.com

Africa surfers from numerous poverty-related poor resource use including poor management of livestock which silts water resources, slash-and-burn crop production which causes deforestation and soil erosion, uncontrolled burning of forests which results in damage to soil quality, and charcoaling for energy which contributes to deforestation. Poverty-related socio-economic activities of these types accelerate environmental degradation and negatively contribute to climate change. In particular, energy insecurity in society results in a negative impact on socio-economic activities and climate change, reaffirming the statement by the United Nations Development Programme which reads: "Energy is central to sustainable development and poverty reduction efforts. It affects all aspects of development including livelihoods, access to water, agricultural productivity, health, population levels, education, and gender-related issues". Unfortunately, many national and regional initiatives and programmes in Africa aimed at reducing poverty have not adequately taken into account the pivotal role of energy in human activities. Promotion of sustainable clean renewable energies should be a pro-poor development strategy for Africa to address both modern energy needs and reduction of climate change-induced occurrences. Of the various available options for Africa to address energy poverty and the associated climate-change is the development of liquid biofuels sector, since this sector is participatory and also stimulates economic development. This paper seeks to show that although liquid biofuels options are situation-specific, there are opportunities throughout Africa for both rural and urban areas. The paper further seeks to demonstrate inherent economic activities and approaches in the sector that have high positive impact on climate change.

Title: Learning through failure: The CleanStar project in Mozambique

Author: Dr. Alexandros Gasparatos, IR3S-University of Tokyo, Email: gasparatos@ir3s.u-tokyo.ac.jp

CleanStar Mozambique was a private venture that promoted ethanol as a clean cooking fuel alternative to charcoal. It was expected that CleanStar would provide a stable, clean and sustainable source of cooking fuel by displacing charcoal whose price had tripled in the previous years and was responsible for large deforestation and GHG emissions across Mozambique. At the same time it would act as an engine of rural development for cassava smallholders and create high-skilled employment in its state-of-art ethanol facility. CleanStar gained a lot of prominence as a win-win sustainability project, receiving large amounts of funding from foreign investors (incl. climate financing), and "political" support from policy-makers, international organisations and the civil society. The idea was that cassava from smallholders in north Mozambique would be transported to a state-of-art distillery in Beira (Central Mozambique) to produce ethanol. The ethanol would then be shipped to Maputo (South Mozambique) and used in NDZiLO ethanol stoves. While the marketing and commercialization of stoves and branded cooking fuel showed good positive results with over 40,000 stoves sold, CleanStar started facing difficulties shortly after the unveiling of its ethanol facility (3/2013), totally closing in 2014. The presentation re-constructs the history of CleanStar's rise and decline, identifying the main reasons behind its initial popularity with investors and other stakeholders. We put these initial expectations into perspective with interviews from key persons involved within CleanStar and other peripheral activities. We identify the positive lessons learned from the successful commercialization of stoves and the negative lessons learned from the development of the fuel, to inform the design of other ethanol stove initiatives in Africa and increase their viability.

Date: 29 October 2015 - Day 2

Time: 11:00 – 12:30

Governance 2: Governance and Climate Change in Africa: Broad Issues to be detailed for Paris – chair, Prof. Khalid Ali El Amin

Title: Sustainable Development Under CC - Achieved through Climate Responsive Local Government Plans and Budgets?

Author: Ms. Fiona Percy with Maurine Ambani et al, CARE International, Email: fiona@careclimatechange.org

Climate change impacts are increasing across Africa, but are highly localised and unpredictable. Sustainable Development under CC can only be achieved when development planning integrates adaptation at all levels and sectors, and when development planning systems enable informed and multi-sectorial decision making at the local level. Integration of adaptation in planning improves local understanding of climate risks and vulnerabilities and supports better linkages between development investments and risk reduction and management linked to climate information and early warning systems. Community based adaptation (CBA) enhances this further through integration of community priorities and plans. Cost benefit analysis in Kenya and Niger has shown that the process of climate informed planning with a focus on strengthening of adaptive capacity to respond flexibly to climate impacts and uncertainties is highly cost effective, with social, environmental and economic benefits. However, national and local development budgets need to be augmented by adaptation finance in a well coordinated way to meet the CC challenge. Examples are drawn from CARE International's Adaptation Learning Programme in Ghana working with District Assemblies and the National Development Planning Commission to mainstream community based adaptation into the development planning process. This was done through incorporation of climate vulnerability and capacity assessments into national implementation guidelines and inclusion of adaptation in the assessment criteria for determining local government budgets, together with training of District planners and demonstration of successful use of community adaptation action plans in two districts.

Title: Global climate governance and African civil society

Author: Prof. Patrick Bond

Title: Implementation of Climate Policy in West-Africa: Insights from Ghana, Mali and Senegal

Author: Dr. Edmond Totin, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Email: e.totin@cgiar.org

Donors, international and multilateral organizations have provided support to West African governments to help them finalize national climate change mitigation and adaptation plans and policies. Although a number of adaptation and mitigation measures are available in these countries, the national authorities are still struggling to translate plans into concrete actions. By focusing on three case-studies (Ghana, Mali, and Senegal), this paper aims to provide researchers, policy makers and development practitioners, working on climate change action plan and climate related issues, with a better understanding of what hampers successful climate policy implementation across sub-Saharan Africa, and to propose ways to overcome identified obstacles. The study indicates that (a) slow policy development and approval processes, (b) lack of policy awareness and information sharing across scales, and (c) poor capacity building for policy implementation officers and ineffective funding flows from the central government to the local authorities due to incomplete decentralization processes, are the major barriers that hamper successful climate policy implementation across sub-Saharan Africa. Establishing multi-stakeholder platforms at national and district levels would be a positive strategic approach to enhance information flows, engage more stakeholders (including the private sector and traditional authorities) in the policy process, and enable effective climate policy development and implementation in West Africa.

Solutions Forum 1: Climate Finance – chair, Dr. Tom Owiyo

Title: Embracing Values Beyond the Financial Value: A reflection on the Monetization of Climate Change Reversal Efforts

Author: Mr. Kabiito Bendicto, Uganda Martyrs University, Email: benelavia@yahoo.co

The dominant discourse upholds an idea that accumulated financial capital (money), can reliably address climate change challenges. What is often neglected is the fact that since the current trends of climate change is blameable on money-making human enterprises; the ability of the product of such enterprises (liquid capital/money) to address the environmental and climate consequences they create is put in question. The big question to be addressed by this study is; can a bad master (towards climate change) be a good servant (towards its address)? This study attempts to challenge a dominant modernistic-capitalistic tendency of thinking that money and technology can resolve problems of the world. In this study, climate change is viewed as closely linked to environmental destruction by the modernistic practices of capitalism and consumerism. Herewith, 'capitalistic' development (in its extremistic tone) is viewed as predatory to natural the environment and a master-minder of climate change. In many cultures of the world, environmental conservation is/was communal responsibility and a religious requirement. In the current global order though, money is the driving force, even of climate change work; even tree planting (conservation) is largely done as a business endeavour. Africa needs to look beyond the monetary gains for values of vitality; industrialists need to learn that

increasing the amount of money dedicated to climate change, without decreasing carbon emissions is no solution. This study intends to argue that finances should not be the driving force behind climate change redress, but a desirable companion to uphold higher environmental value.

Title: Weather Shocks and Financial Adaptation: Making Unbanked Households Secure on Rainfall Derivatives Microinsurance in Nigeria

Author: Mr. Awolala David Olufemi, West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), Universite Cheikh Anta Diop, Dakar, Email: ddawolala@gmail.com

Failures of subsidized crop insurance schemes and rising trends of climate extremes have increases farmers vulnerability to higher risks. With ideal levels of adaptation, some residual impacts from weather shocks would still lead to economic losses. This study carried out a bioclimatic assessment and analyzes potential demand for rainfall-index insurance as financial adaptation in central west Nigeria. The study shows that monthly distribution of rainfall uncertainties keep expanding significantly between August and July thereby constraining optimal planning within available production period. Further climatic analyses reveal radiation index of dryness of 1.394, at an evaporation rate of 949 mm/year and rainfall deficit of 366 mm/year, hence the region is rapidly moving towards aridity. Farmers' vulnerability to rainfall delay, early cessation and long dry spell has economic consequences, likely impacts are recurring food deficits and income losses arising from loss of standing maize crops. A first stage heckman ordered-probit model results has a significant log pseudolikelihood value of -203.46 at 0.007 level. The inverse coefficient of age, experience, access to social networks, access to extension services on drought management, access to bank credits, production risk index and finance risk index will negatively influence farmers' decisions for willingness to insure in rainfall index insurance. Increasing farm size has significant negative impact on WTI in rainfall index microinsurance. The positive probabilities from marginal effects explained that farmers' distance to nearest weather station and households size have significant($P<0.05$) influence to increase demand for WTI in rainfall index microinsurance in the sub-humid. This study provides frontier insight into the demand for rainfall-index derivative crop microinsurance for the financially excluded in Nigeria

Title: Adaptation Finance in the Post2015 World: Options for Africa

Author: Dr. Fouad Bergigui, United Nations Development Program, Email: fouad.fmjid@gmail.com

Adaptation remains underfunded worldwide and its cost substantial for African countries. Based on current estimates, global adaptation needs will cost tens of billions while existing data suggests a pledged USD 3 billion cumulatively to multilateral adaptation funds, expressing thus the urgent need to close the adaptation gap especially in Africa. If innovative financing mechanisms proved to be effective for climate change mitigation, one could apply the same thinking to cross the adaptation-funding chasm. In fact, Africa can still tap into conventional ODA funding and its domestic resources while harnessing new opportunities that may arise from auctions of emissions allowances, carbon market based levies and other climate financing mechanisms and multilateral funds as proposed by parties to the UNFCCC. As long as Africa is concerned, and while consensus pops-out for the instruments for adaptation funding to be new and additional, there is a huge need to tackle its absorptive capacity through strategic spending. Indeed, national ownership and transparency in decision-making are pre-requisites for success in channeling additional adaptation funds.This paper will attempt to draw on lessons learned from Africa's experience with the World Bank's Pilot Program for Climate Resilience, the Global Environment Facility's Least Developed Countries Fund, the Special Climate Change Fund and the Adaptation Fund. Doing so, policy recommendations will contribute to explore the how of enabling African states to be strategically positioned to harness opportunities from innovative carbon based funding for Adaptation while delivering effectively on the new multi-billion Green Climate Fund with 50% of its resources earmarked for SIDS, LDCs and African States.

Title: Opportunities for innovative finance for adaptation

Author: Mr. Charles Mulenga

Solutions Forum 2: Agriculture – chair, Mrs. Margaret Sangarwe-Mukahanana

Title: Unlocking the potential of climate information services to achieve sustainable development and climate resilient agriculture

Author: Ms. Maurine Ambani and Fiona Percy, CARE International, Email: akasuvu@careclimatechange.org

Climate change is bringing new and increasing risks and uncertainty to livelihoods and development in Africa. For sustainable development and climate resilient agriculture to be achieved in a changing climate, it is essential to use climate information in decision making. This allows for consideration of a broad range of climate risks and opportunities, resulting in investments, plans and actions which are forward looking, flexible and robust enough to manage future uncertainty. This paper presents evidence from the Adaptation Learning Programme - implemented by CARE International in Ghana, Kenya and Niger - demonstrating that for climate information to be useful and usable, it must be downscaled and interpreted to suit different contexts and user needs. This works best in multi-stakeholder platforms where local knowledge and climate science are shared, combined and used in

decision making on innovative local plans and actions. These plans and actions integrate adaptation, disaster risk reduction and early warning systems into agriculture systems and development planning, thus enhancing productive outcomes, climate risk management and resilience across sectors. More resources are, however, needed for: a) technical support and systems for national meteorological services to know the diverse and changing user needs and develop climate information products that meet these needs, b) capacity building of users to understand and use climate information in decision making, c) integrated communication systems for wide reach and efficiency, for example, linking climate information services with agri-business/market information services and early warning systems, and d) multi-stakeholder dialogue and collaboration, with participation of users, to design and deliver locally relevant climate information services.

Title: Evaluation De La Productivite et Des Usages De Ces Especes Vegetales Dans Les Complexes Agroforestiers? Base De Cacaoyers

Author: Ms. Ngagoum Veronique, Faculty of Agronomy and Agricultural Sciences (FASA), University of Dschang (Cameroon), Email: ngagoumveronique@outlook.com

De nombreuses esp?ces v?g?tales poussent de fa?on spontan?e dans les cacaoy?res ou peuvent y ?tre introduites d?lib?r?ment pour procurer de nombreux services et produits aux agriculteurs. La pr?sente ?tude r?alis?e de janvier ? juin 2014 dans la r?gion du Centre avait pour but l'?valuation de la productivit? et des usages de ces esp?ces dans ces complexes agroforestiers ? base de cacaoyers. Plus sp?cifiquement, il s'est agit d'identifier les diff?rentes esp?ces arborescentes autres que le cacaoyer pr?sentes dans les SAF cacaoyers, de recenser les produits et les services rendus par ces esp?ces; de d?terminer les saisons, les fr?quences et les quantit?s annuellement produits ; de d?terminer les motivations des cacaoculteurs ? associer ces esp?ces aux cacaoyers, ainsi que l'importance relative qu'ils accordent aux diff?rentes esp?ces. Pour atteindre ces objectifs, un inventaire des esp?ces arborescentes associ?es aux cacaoyers a ?t? r?alis? dans 56 cacaoy?res dans la zone de Ngat et de Nkolo-bang; une enqu?te a ?t? r?alis?e aupr?s de 56 agriculteurs. Les donn?es collect?es ont fait l'objet d'une analyse descriptive. Les r?sultats de l'inventaire ont r?v?l? que 5834 arbres fruitiers et 564 arbres forestiers repr?sentant 39 esp?ces et 23 familles ont ?t? recens?s dans les cacaoy?res de la zone d'?tude. L'indice de Sorensen a donn? une valeur de 0.55, indiquant qu'il y a une probabilit? de 55 % de retrouver les esp?ces identiques dans les deux zones. L'indice de diversit? de Shannon avec les valeurs 2.15 bits ? Nkolo-bang et 2.66 bits ? Ngat, l'indice de diversit? de Simpson avec les valeurs de 0.217 ? Nkolo-bang et 0.096 ? Ngat et l'?quitabilit? avec des valeurs de 0.26 ? Nkolo-bang et 0.314 ? Ngat t?moignent d'une forte diversit? floristique. Les motivations des producteurs ? associer les esp?ces sont: g?n?rer du revenu, produire le bois, augmenter la fertilit? du sol.

Title: Improvement in Egg Production in Laying Chickens with Honey During Hot Season

Author: Dr. Monsuru Oladimeji Abioja, Federal University of Agriculture, Abeokuta, Nigeria, Email: abiojamo@funaab.edu.ng

Honey contains some anti-oxidants that may help in ameliorating the adverse effects of heat stress and improve egg production in chickens. One hundred and twenty 28-week-old laying chickens were used in an experiment which lasted for 16 weeks during hot-dry season. The 16 weeks experimental period was divided into 4 phases (I- week 1-4; II- week 5-8; III- week 9-12; and IV- week 13-16), of 4 weeks each. The laying birds were allotted to 3 treatments comprising 0 (CONTROL), 10 (10H) and 20 ml honey per litre water (20H). There were 4 replicates with 10 birds per replicate. Data on egg hen-day production (EP), egg weight (EW) and survival rate (SR) were subjected to one-way ANOVA using SYSTAT (1992) package. EP was significantly ($P<0.001$) affected by treatment during phase I-IV. Addition of 20H resulted in higher EP (61.3%) than CONTROL birds (52.3%) in phase I. In phase II, the EP was similar in CONTROL and 20H. However, higher EPs were recorded in CONTROL (64.1 and 65.9%) than in 20H (53.6 and 46.7%) in both phases III and IV respectively. EW was significantly ($P<0.01$) affected by honey in week 1. Birds on 10H laid heavier (62.5g) eggs than CONTROL (56.5g). However, the difference in EW in week 2 to 16 was not significant. Addition of honey had no significant ($P>0.05$) effect on SR throughout the experiment. In conclusion, to ensure improvement in egg production in laying chickens during hot-dry season, duration of honey supplementation should not exceed first 4 weeks.

Title: Predictors of Off-Farm Adaptation to Climate Variability and Change among Smallholder Farmers in Ghana

Author: Mr. Divine Odame Appiah, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, Email: dodameappiah@yahoo.com

There is an intricate connection between rural poverty, livelihoods and climate change in the Offinso Municipality in the Ashanti region of Ghana. Conscious of the vagaries of climate change, smallholder farmers are expected to develop concrete off-farm adaptation measures to obviate vagaries of climate variability and change. This paper examines the off-farm adaptation measures among smallholder farmers in the Offinso municipality with the view prompting effective policy making and implementation. A triangulation of quantitative and qualitative research design and a non-probability purposive sampling technique were used. On the basis of populations, 300 interviewer-administered questionnaires were used to collect data from smallholder farmers in 6 out of 24 farming communities. Data generated were analyzed using thematically as well as through contingency table, frequency, Chi-square test of association and regression at ?0.05 in the SPSS v. 16, for windows applications. Pearson's chi-square (x^2) value of 10.867 with a Cramer's V value of 0.198 was significant association ($p < .028$) between off-farm income generating activities and disposition of farmers to consider an alternative livelihood other than farming. The logistic regression indicated that three

predictors were significant at p< 0.014, p< 0.038 and p< 0.003 respectively. At a 95% confidence interval (CI), these variables had lower to upper CIs for each of the EXP(B) = 1.269--2.283 times Odds, at CI = 1.181--4.412, CI = 1.013--1.590 and CI = .497--.868 respectively. This paper recommends vigorous extension work by the Department of Food and Agriculture.

Climate Change and Gender 2: Gender and Climate Change Adaptation- chair, Dr. Johnson Nkem

Title: Vulnerabilite Economique Des Femmes Maraeche Res Et Strategies D'adaptation Aux Changements Climatiques A Korhogo (Cote D'ivoire)

Author: Dr. Kouadio Alain Serges, Universit? Nangui Abrogoua (ex Universit? Abono-Adjam?), Email: kouadioal@hotmail.com

Situ?e au Nord de la C?te d'Ivoire, la r?gion de Korhogo est dans une zone semi-aride marqu?e ces derni?res d?cennies par la manifestation simultan?e de s?cheresses et d'inondations. Cette situation affecte rudement la production mara?ch?re domin?e par des femmes g?n?ralement pauvres b?n?ficiant de faibles assistances. L'objectif de cette ?tude est d'?valuer la vuln?rabilit? ?conomique de ces femmes en vue d'identifier les facteurs de r?silience les plus appropri?e. Pour ce faire, 45 femmes mara?ch?res ont ?t? enqu?t?es de fa?on al?atoire sur trois sites de productions situ?s autour de barrages hydro agricoles ? la p?riph?rie de la ville de Korhogo. Selon les femmes interrog?es, la s?v?rit? des changements climatiques sur leurs activit?s se traduit par la rar?faction de l'eau (69%), l'ass?chement des terres agricoles (52%), la diminution des superficies agricoles (50%), le dess?chement des champs (40%), les inondations des champs (60%). Cette situation entra?ne une baisse de la production (67%) malgr? les strat?gies d'adaptation adopt?es par les femmes telles que l'utilisation de compost (65%), la diversification des cultures (98%). Il ressort de l'?tude que l'efficacit? de ces strat?gies pourrait ?tre assur?e que si des strat?gies compl?mentaires, actuellement m?connues ou non contr?l?es par les femmes, font l'objet d'information et de renforcement des capacit?s aupr?s des femmes. Il s'agit notamment de l'irrigation, la red?finition des calendriers agricoles et du creusement de nouveaux puits. Une am?lioration de l'assistance technique et financi?re des femmes sera ?galement n?cessaire pour accroitre leur r?silience.

Title: Gender and Climate Change, Opportunities for Africa to Reboot its Climate Responses

Author: Ms. Sara Ennya, African Youth Initiative on Climate Change, Email: ennyasara@gmail.com

There is a critical yet quite unrevealed gender dimension to a changing climate in Africa as climate patterns affect women and men, girls and boys differently due to gender-based roles across African societies. Indeed, climate change exacerbates existing gender inequalities rising particularly women's exposure to climate threats and pointing therefore urgent adaptation needs. While they suffer from its consequences, women as change agents could play a key role in shaping and delivering effective and sustainable climate responses. In fact, climate change creates risks but also opportunities since equal investments in women and men may lead to greater returns across the SDGs and the broader sustainable development agenda. Through this paper, we will explore options to reboot the climate response through fit-for-purpose and gender sensitive adaptation and mitigation policies and programs. To do so, development practitioners and decision makers need to mainstream gender into policymaking, mitigation and adaptation planning, climate financing and the implementation of climate responses. Doing it both, at scale through top down policies, but also through bottom-up small scale and innovative solutions that kill the old darlings of development as usual could be the ultimate combination to come up with responses to support gender parity and equality, women's empowerment and climate change adaptation and mitigation.

Title: Vers des Reponses aux Changements Climatiques Adaptes au Genre

Author: Ms. Ndzengue amoa sabine, Universit? d'Evry, Email: sabineamoa@gmail.com

En cette p?riode o? les impacts des changements climatiques sont perceptibles ? travers le monde, notamment en Afrique, diverses raisons sont mises en exergues en vue d'une int?gration du genre face aux diff?rents bouleversements climatiques. De multiples conf?rences des parties, divers colloques ont tous tir? la m?me conclusion : N?cessaire adoption d'une approche << genre >>. Dans la m?me lign?e, certains auteurs ont ainsi mis en exergue les pratiques innovantes apport?es par le genre. Approches se situant entre adaptation et innovation face aux changements climatiques. A y regarder de plus pr?s, la panac?e se trouverait au coeur des r?ponses aux changements climatiques plus sensibles au genre. Notre approche, qui se veut syst?mique, tirera la quintessence des solutions pr?conis?es au pr?alable par la doctrine et mettra par la suite en exergue la n?cessit? d'une ?volution, d'une adaptation des r?ponses aux changements climatiques par rapport au genre.

Title: Gender Analysis of Adaptation Strategies of Water Stress among Crop Farmers in Asa Local Government Area of Kwara State, Nigeria.

Author: Aluko O.J., Osikabor .B, Adejumo A.A. and Samuel O.F*, Forestry Research Institute of Nigeria, Email: juliwal2002@yahoo.com*

Nigeria Concern over the potential effects of long-term climatic change on agriculture has motivated a substantial body of research over the past decade. This body of research addresses possible physical effects of climatic change on agriculture, such as changes in crop yields and other aspects of agriculture, as well as the economic consequences of these potential yield changes.

The study was carried out to determine the adaptive strategies of water stress employed among arable crop farmers based on Gender in Asa LGA of Kwara State. Data were collected through the use of interview schedule and analysed using descriptive and inferential analysis. The findings of the study revealed that the majority had small farm size of range 1-5 acres. Vegetable, cassava, maize, sorghum, yam and sweet potatoes were major arable crop cultivated by the respondents in the study area. Age, farm size and level of education were found to have significant relationship with adaptive strategies of water stress. Significant difference also existed in the adaptive strategies of water stress along gender line. It is concluded that both men and women are involved in arable crop production in the study area and both experience water stress but female farmers reported a high level of water stress than men. The study recommended that women arable crop farmers should be given access to resources, and irrigation system should be provided for arable crop farmers.

Date: 29 October 2015 - Day 2

Time: 14:00-15:30

Climate Change and Energy 2: Renewable Energy for Climate Change Mitigation – Chair, Mr. Mbiriri

Africa Energy Outlook – Mr. Simone Landolina

REmap Africa, Dr. Asami Miketa

Valorization of Biomass Residues as an Energy Source in Africa, Shunichi Nakada

Africa renewable energy Initiative, Seyni Nafo

Solutions Forum 4: Climate Science and Indigenous Knowledge Systems – Chair, Frank Rutabingwa

Title: Climate compatible crop husbandry: A case from Ethiopia

Authors: Fassil Kebede, University of Gondar, e-mail: elroifky@gmail.com

Climate change poses unprecedented challenges to agriculture. Role of agroforestry systems was evaluated to offset the challenges. Thus, a 100x100 m plot was delineated to identify and count trees for biomass and CO2-e estimation. Besides, 81 soil samples were collected at three radii distances from each tree and three soil depths. TOC was analyzed in the Laboratory. Macro-fauna abundance was measured by counting and calculating the various indices. The studies revealed that the highest and lowest soil productivity indices were 0.74 and 0.58 at the radial distances of 0-2 m and 4-8 m, respectively. The highest 235.7 and lowest 56.9 kg tree-1 CO2-e were recorded in the oldest and youngest trees, respectively. A significant ($P<0.05$) difference in macro-fauna abundance was found bewteen the traditional agroforestry system and farmlands without a tree. Higher soil macro fauna (1376/m2) abundance was found in the indigenous agroforestry system than in the farmland (959/ m2). Shannon index of diversity of macro fauna was also higher in the indigenous agroforestry systems (1.28) than the farmlands without trees (1.17). A higher (41 kg m2-) CO2-e was recorded in the indigenous agroforestry systems than in the farmland soils at 0-10 cm depth (i.e. 32.2 kg m2-). This study recommends agro-foresty systems as a means of Climate change compatible crop husbandry.

Title: Cocoa Farming Households in Ghana Consider Organic Practices as Climate Smart and Livelihoods Enhancer

Authors: Joseph Bandanaa, University of Ghana, e-mail: miparkerjnr@gmail.com

Ghana's concern for global environmental change has resulted in several state and non-state actors supporting households to position for changing climate adaptation, mitigation and food security. Organic agriculture is being promoted as a climate smart option among cocoa farmers in the Ashanti region of Ghana. This study measured the flora diversity and livelihoods position in organic farming systems and compared it with that of the conventional. The experiment included thirty-two households. Jaccard similarity and Shannon and Simpson diversity indices were measured to assess species similarity, abundance, evenness and dominance. The indicators used to describe sustainable livelihoods were food security, income, vulnerability and wellbeing. Three life forms including trees, shrubs and herbs were studied for food security. The results of the study showed that although the species are quite similar, the level of life form abundance and the random and aggregated species distribution patterns of organic farms was higher than that of conventional. The Shannon index for organic farms (specie abundance and evenness) was slightly higher (0.808) than that of conventional farms (0.762); the Simpson indices (specie dominance) were 0.051 and 0.084 for organic and conventional farms respectively. The organic cocoa farmers studied consumed and sold more flora; the general wellbeing (covering health cost) and resilience (participation in farmer organisation) of the organic farmers was better. Since organic farming has more biodiversity it is considered more environmentally friendly and climate smart. More farm households should be encouraged to practice organic farming to improve livelihoods outcomes and enhance climate change mitigation.

Title: Mainstreaming Indigenous Knowledge to enhance Climate Change Adaptation among local Communities in Western Kenya

Author: Evans Wabwire, Catholic University of Eastern Africa, e-mail: ewabwire@cuea.edu

The current observable evidences of climate change and variability are indeed a threat to socio-economic stability of the society. The impacts of climate change are even greater to the vulnerable groups of the society. Adaptation and mitigation strategies are measures to adapt to the changing climate over space and time. This greatly reduces the impacts of the climate change and variability to the society. The utilization of the Indigenous Knowledge (IK) together with the scientific information is currently sources for climate information for disaster risk reduction. This study examined the effectiveness of IK in enhancing climate adaptation amongst the dominant Luhya, Itesos and Sabots communities in Western Kenya. The data used were daily rainfall datasets gathered through desktop review, interviewing of respondents and local farmers through questionnaires and lastly through expert judgment opinion analyzed over thirty years. Both the IK and climate information was validated against the available datasets.The IK information validated against the observed datasets showed a deviation of + - 1day of occurrences. The

weather forecasts from Kenya Meteorological Department (KMD) when validated against the observations deviated slightly between 3-4 days of occurrences. However, when both the IK and scientific information were considered before reaching climate consensus, the deviation reduced between half a day to one day. The IK expert expressed their in ability to forecasts occurrences of disturbances like tropical cyclones which have effects of delaying the onset and cessation of seasonal rainfall. These findings reveals greater reliability and correctness of climate information derived from both IK and scientific information.

Title: Integration of indigenous knowledge with ICTs in managing risks and uncertainities in agriculture in Kajiado county

Author: Carolyne Manei, University of Nairobi, e-mail: kianyux87@gmail.com

Climate change threatens production's stability and productivity. In many areas of the world where agricultural productivity is already low and the means of coping with adverse events are limited, climate change is expected to reduce productivity to even lower levels and make uncertainities in agriculture higher. To help in managing risks and uncertainities in agriculture which are mainly contributed by negative impacts of anthropogenic climate change, local people employ traditional indigenous-knowledge based practices. This local based knowledge, which has evolved over several hundreds of thousands of years in tandem with the domestication of plants and animals, is critical for responding to uncertainities in agriculture at the local level. ICTs have the potential improve access to this knowledge among other relevant information and social networking opportunities. The research was carried out to assess relevant Indigenous knowledge used by Indigenous people to cope and adapt to climate change and variability effects therefore managing risks and uncertainities in agriculture as well as evaluate opportunities for utilizing ICTs to communicate this information. Results indicates that farmers have shifted to farming historically known drought tolerant crops, rain water harvesting, irrigation, use of organic manure, traditional methods of treating crops pests and diseases, change in planting time, preservation of pastures, indigenous food preservation methods, vaccination ,farmers are also increasingly relying on their own indigenous knowledge in predicting weather patterns compared to scientific knowledge. Various communication mechanisms taking advantage of ICTs such as radios and mobile phones are emerging as viable tools for dissemination of relevant information to the farmers as they are affordable and use of local language which is easily understood by farmers.

Climate Change and Forest 1: REDD+ and COMIFAC – Chair, Prof. Godwin Kowero

Title: Opportunities and Prospects of Forest Based Clean Development Mechanisms and REDD+ Projects for Sustainable Development in Africa

Author: Vincent O. Oeba, African Forest Forum, e-mail: vongusoeba@gmail.com

Majority of the African countries have ratified the Kyoto Protocol that has enabled them to benefit from climate change finances. The introduction of carbon voluntary market has generated a number of REDD+ projects in Africa. This paper addresses the investment opportunities and prospects of forest based CDM and REDD+ projects. It also reports on factors affecting accelerated uptake of CDM and REDD+ projects. Primary data was collected from 11 African countries within various sub regions and secondary data was obtained from UNFCCC database and other relevant sources. The key economic, social and environmental benefits were employment creation, provision of water, education services, and ecotourism and biodiversity conservation among others. It was also evident since 2004 to 2014, only 2 % of all registered CDM projects were from Africa as compared to 84 % from Asia and Pacific Ocean, 13 % from Latin America and Carribean and 1 % from Economies in Transition. This was because of complicated processes and methodologies on developing CDM and REDD+ projects especially on project design document (PDD) resulting to heavy transactional costs of hiring international experts to support local communities and African governments. The stringent rules on implementation of Kyoto Protocol on afforestation and reforestation programmes slowed registration of CDM projects in Africa. The political instability and war among African states has continued to scare investors. Enhanced funding, training among relevant stakeholders and formulation of legal, policies and institutional frameworks will significantly strengthen economic and social blocks of REDD+ and CDM projects in Africa.

Panel discussion: Discussants:

Agriculture 2: Climate Change and Food Security – Chair, R. Chitsiko

Title: Simulating climate change effects on growth and yield of maize grown under semi-arid conditions of central Zimbabwe

Author: Veronica Makuvaro, Midlands State University, e-mail: makuvarov@gmail.com

Climate directly affects crop growth and development and therefore any significant change in mean climate variables will affect crop yields. The objective of this study was to simulate and compare growth and yield of maize grown using smallholder farmer practices, under current and projected climate by 2050. Two future climates both characterized by a temperature increase of 3oC and a CO2 concentration of 532ppm and differing in the magnitude of reduction in rainfall amount were considered. The two future climates had reductions in rainfall amounts of 10% and 15% respectively, from the current climate. The CO2 concentration used for the current climate was 370ppm. Days taken to reach physiological maturity, stover yield and grain yield of two maize varieties (early and late maturing) were simulated using APSIM model, for the three climate scenarios. Simulated data were tested for significant differences using the t-test for normally distributed data and non-parametric tests, the Kruskal -Wallis and Manny

Whiteney tests for non-normally distributed data. Results showed significant reduction (P<0.05) in days to physiological maturity due to climate change, for both varieties. However, there was no significant difference in physiological maturity between the two future climates. There were no significant differences (P>0.05) in grain yield for the two varieties as well as in stover yield for the early maturing variety, among the three climate scenarios. There was, however a significant difference (P<0.05) in stover yield between the current and future climates, for the late maturing variety.

Title: Vulnérabilité de la production agricole face à l'instabilité intra-saisonnière des pluies: la zone vivrière du Nord-Borgou au Benin

Author: Yabi Ibouraima, University of Abomey-Calavi - Benin, e-mail: yafid2@yahoo.fr

Secteur stratégique la sécurité alimentaire au Bénin, la zone vivrière du Nord-Borgou est sujette à forte variabilité pluviométrique. Outre la variabilité interannuelle qui a déjà fait l'objet des plusieurs travaux, il est nécessaire d'appréhender les perturbations intra-saisonnières dont dépendent les calendriers culturaux. La méthode utilisée s'appuie sur la détermination des dates de début et de fin de saison à partir des hauteurs journaliéres de 4 stations entre 1941 et 2010. Ensuite, l'analyse fréquentielle du début, de la fin et de la longueur des saisons a été faite aux fréquences 8 années sur 10, 5 années sur 10 et 2 années sur 10. En outre, la fréquence et l'ampleur des séquences sèches et humides ont été analysées. En moyenne, la saison pluvieuse dure 14 décades (3eme décade de mai – 1ere décade d'octobre) avec cumul pluviométrique moyen variant entre 600 et 800 mm. Ce contexte pluviométrique permet une bonne campagne agricole. Mais en réalité, il y a une forte instabilité pluviométrique a savoir des démarrages tardifs des pluies (20 et 35 % des années) et de fins précoces (25 et 35 % des années) qui induisent un raccourcissement de la saison sans oublier les séquences seches qui sont nuisibles aux activités culturales. La dégradation de la qualité de la saison pluvieuse s'est accentuée depuis les années 1970 en phase avec la décroissance des totaux pluviométriques malgré la reprise pluviométrique des années 1990. Par ailleurs, il y a l'apparition des séquences trés pluvieuses qui occasionnent des inondations désastreuses pour les cultures. L'élaboration des calendriers agricoles actualisés, un accompagnement plus accru des producteurs, constituent des défis majeurs pour tous les acteurs.

Title: Crop suitability mapping for climate change adaptation

Author: Dr. Carlo Faddo, Bioversity, Ethiopia

Title: Climate Change and Poverty

Author: Marianne Faye

Governance 3: Non State Actors in Climate Governance – Chair, Dr. Lyn Ossome

Title: Urban Planners and engagement with The Climate Change Agenda in Africa

Author: Prof. Beacon Mbiba

Title: CBDR (+RC), resource endowments and climate change governance in the East African Community

Author: Dr. Ngeta Kabiri

Title: Local communities, state and non-state actors in the changing climatic environment in Zimbabwe

Author: Munyaradzi Mawere, Great Zimbabwe University, e-mail: munyaradzimawerem@gmail.com

Climate change is a topical issue in many countries across the world. Due to its lasting impacts on human lives and the natural environment, climate change is discussed across disciplines. This is a clear testimony that problems and threats prompted by climate change require inter- and multi-disciplinary approach that recognise and foster multiple epistemologies. While the aforementioned approach appears plausible in mitigating the tapestry of challenges posed by climate change, in many rural communities in Zimbabwe, a mono-epistemic thrust is often emphasised by the state and many non-state actors in the country. This paper explores pathways through which rural farmers in southern Zimbabwe are coping with a changing climatic environment. The discussion is premised on interventions by 'outsiders' (in this case both state and non-state actors) in their attempt to build resilience in rural communities, an approach which based on my research results, is fraught with contradictions and epistemic pitfalls. This is because local communities are often enticed by outsiders to abandon their own indigenous adapting strategies, and to join projects with offers of grand prices (to those farmers who excel), inorganic fertilisers and seed. Unfortunately, more often than not, the rural communities are left with no exit strategy by the outsiders such that as soon as the later disappear from the scene the projects collapse, thereby leaving the communities even more insecure and vulnerable to the changing climatic environment than ever. In view of these observations, this paper makes a number of suggestions on how the state and non-state actors in Zimbabwe could intervene in rural communities in a manner that help building lasting resilience of the communities to the changing climatic environment.

Title: Earth System Governance in Africa

Authors: Senay Habtezion, Adelekan Ibidun, Aiyede Emmanuel, Biermann Frank, Fubara Margaret, Gordon Chris, Gyekye Kwabena, Kasimbazi Emmanuel, Kibugi Robert, Lawson Elaine, Mensah Adelina, Mubaya Chipo, Olorunfemi Felix, Paterson Alexand; Global Change SysTem for Analysis, Research and Training (START), e-mail: shabtezion@start.org

Traditional approaches for understanding environmental governance - such as environmental policy analysis or natural resources management - do not adequately address the gamut of human-natural system interactions within the context of the complex biogeophysical cycles and processes of the planet. This is perhaps more so in the African regional context where the relationships between traditional and modern governance systems and global change dynamics are arguably more pronounced. The Earth System Governance (ESG) Analytical Framework encompasses diverse systems and actors involved in the regulation of societal activities and behaviors vis-à-vis earth system dynamics. The concept encompasses a myriad of public and private actors and actor networks at all levels of policy and decision-making. The existence of, and interaction among, these diverse actors and systems, however, is under-researched in the African context. Various research approaches taken to address critical global environmental change (GEC) challenges in Africa have proven to be inadequate because they tend to overlook the complex interactions among the various local actors, players, and indigenous conditions and practices vis-à-vis GEC system drivers and teleconnections. Similarly, the regional peculiarities in terms of governance typologies and socio-cultural diversity highlight the need for nuanced understanding of the complex interactions and nexuses among multiple actors and interests and Earth system processes. However, this diversity and complexity has often been lost in generalized enquiries. We argue that examination of the governance-GEC nexus through the aid of the ESG Framework would provide a much broader and more helpful insight.

Date: 30 October 2015 - Day 3

Time: 08:00-09:30

Solutions Forum 3: Climate Data for Decision-making – Chair, Dr. A. Makarau

Title: Climate change induced changes on the Hadley Cell: A local diagnosis of the Hadley circulation over South Africa

Author: Dawn Mahlobo, South African Weather Service, e-mail: dawn.mahlobo@weathersa.co.za

In its Integrated Resource Plan (IRP) 2010, the South African government has identified a number of renewable energy options to inform the country's energy mix on the 2030 horizon and beyond. One of these options is solar energy, which depends on the ability of incoming short wave radiation to penetrate through the atmosphere to the ground, where solar energy conversion technologies are located. One of the major phenomena that influence solar power generation is large scale cloud formation. As the former might be impacted by climate change, increasing greenhouse gasses might present opportunities or threats to South Africa's renewable energy industry since this would influence the country's ability to generate electricity from the solar energy resource. Over South Africa, the large scale ascent of air is driven by the subtropical branch of the Hadley cell, and so climate change induced changes in this branch might have a knock on effect that eventually ends up enhancing or threatening solar power generation. A detailed analysis over South Africa of this causal knock on effect is dependent on the ability to properly diagnose Hadley cell motions over the country. This study attempts to provide the local diagnostics of the Hadley circulation over South Africa. The zonally averaged mass stream function have been calculated using the NCEP reanalysis data for the period 1979 to 2013. Preliminary results indicate regional differences of the local Hadley circulation with South Africa in particular characterized by a downward mass stream function for both the DJF and JJA seasons.

Title: Prospects of using the BMI in Southern African Seasonal Rainfall Prediction

Author: Elisha N. Moyo, Ministry of Environment of Zimbabwe, e-mail: enmoyo@gmail.com or moyo_elisha_n@yahoo.co.uk

This research which started off seeking to understand the physical mechanisms driving rainfall systems in southern Africa is a step towards improving the representation of those systems in Regional Climate and Seasonal Prediction Models leading to improved Rainfall projections. Indian Ocean SSTs were identified as critical drivers of southern Africa rainfall with an east to west decreasing influence on the sub region. Of particular interest is the SST anomaly differences between Brandon area (north-east of Madagascar) which when warmer than normal and coupled with cooler than normal SSTs around the Marion Island in south-western Indian Ocean defines the negative phase of the Brandon Marion Index (BMI). This negative BMI phase usually results in reduced (increased) rainfall over southern Africa (the SW Indian Ocean). The mechanism for this is via forcing the circulation patterns which transport moisture away from (towards) the sub-region under warmer (colder) Brandon and cooler (warming) Marion SSTA by creating a depression (ridge) north-east of Madagascar in the Brandon region which weaken(enhance) the north-easterly moist monsoonal winds and ITCZ manifestation in southern Africa. The Brandon Marion Index (BMI) is identified as one of the key systems that played key roles in influencing the observed rainfall during the 2012/2013 rainfall season in southern Africa. The research also found out that the tropical Indian Ocean waters are warming faster than the subtropical SSTs resulting in the 'anticipated' rainfall deficit over southeastern African countries. This necessitates stronger statements to be made on the expected longer term changes in rainfall.

Title: Seasonal forecast of Nile flood by using rainfall over Ethiopian Plateau

Author: Tamer A. A. Nada, Egyptian Meteorological Authority, e-mail: tamer540@gmail.com

Nile River is the main source of water for Egypt to the scarcity of rainfall as a result of Egypt's position in the desert belt in subtropical region. As the Nile River originates from outside the borders of Egypt and that the most important source, not only for the numerous sensitive sectors such as agriculture, industry but also drinking water and human needs. it's necessary for us to examine the nature of the changes and climatological factors, which dominates the headwaters areas and control in the amount flood and playing role to use it to forecast Nile flood and amount of water which resulting from it Before its occurrence by suitable lead time. We use Ethiopian data from NMHS to examine the inter-annual and inter-seasonal variability with dominated oscillation like El Nino Southern Oscillation (ENSO), Indian Ocean Dipole (IOD) and Atlantic Equatorial Mode. We use statistical technics to determine which climate regimes (spatial classification) and its seasons(temporal classification) contribute by main amount for Nile flood. The seasonal classification of the region over Ethiopia, is from February to May, June to September and October to January called Belg, Kiremt and Bega, respectively. Here, more emphasis is given to Kiremt (JJAS) seasons. We utilize also different statistical models to make seasonal forecast like Multiple linear regression (MLR), Principal component regression(PCR), Canonical correlation analysis (CCA) to examine both benefits and disadvantage for each. ENSO predictability was stand as a great barrier in our target but we use statistical technics to use Previous Researches to overcome that obstacle. Finally, we elected the best Multivariate Statistical model (CCA) to make Seasonal Forecast using May SST after examine the skills of each different statistical model .

Title: Making climate data useful for decision makers at the local scale: the case of Nkayi district, Zimbabwe

Author: O. Crespo, S.S. Nangombe, T. Muhwati, P. Masikati, S. Homann-Kee Tui, , E.N. Moyo, D. Nyoni, J. Rurinda, University of Cape Town, e-mail: olivier@csag.uct.ac.za

The climate change research community recognizes that climate data need to be translated into climate information useful and relevant for various users such as farmers and decision makers. They need context specific answers to increase their adaptive capacity and to allow effective planning. The most common challenge is to provide information on how climate variability and change will affect the current and future production of crops and livestock, and the entire agricultural systems. The Agricultural Model Intercomparison and improvment Project (AgMIP) supports co-exploration of climate data analysis and climate information needs, with climate scientist and regional stakeholders, to produce useful climate products and services. Through dedicated and iterative engagement with local communities and regional stakeholders we propose dedicated analysis of current and future climate projections, delivered in formats that will help farmers and stakeholders to make better informed decisions. We present the results for Nkayi district in Zimbabwe. The climate is semi-arid, with dry moderately cold winter and variable low rainfalls during the hot summer, thus high risk for predominantly rain-fed agriculture. Future projections for the area show consistently increasing temperatures, but inconsistent rainfall changes. Local stakeholders are well aware of and mostly suffering those climate changes, but lack the relevant information to face them. Regional climate and crop research institutions, with Zimbabwean Meteorological Services, Climate Change Management and Ministry of Agriculture, with Nkayi and local farming community representatives, started co-exploring and proposing new ways to respond to local needs for climate information. This will contribute to the Impact Explorer (IE), web-based tool dedicated to the dissemination of locally relevant climate information.

Climate Change and Disaster Risk Reduction 1: Capacity Building for Disaster Risk Reduction and Resilience – Chair, Prof. Bernard Manyena

Title: Collaboration on Building Capacities of African SIDS - Multi-Hazard Risk Assessment and Mapping of Marine and Land Resources

Author: Dr. C.J. van Westen

Title: Building resilience to extreme weather and climate change - amplifying outputs and outcomes at project level to infuse policy, planning for African sustainable development

Author: LawrencE Flint, International consultant on climate resilient futures, e-mail: lawrence.flint@gmail.com

Resilience is a developing theme in the climate and development arena. It takes into account the likelihood of increasing frequency and intensity of exogenous shocks such as extreme weather and slow onset climate change events and their associated direct and indirect impacts (economic and non-economic in nature). Resilience adopts a holistic, multi-sectoral approach to addressing vulnerability from a development perspective. In the run-up to CoP21 in Paris, the increasing relevance of resilience to the sustainable agenda has been recognised at the Sendai Framework for Disaster Risk Reduction 2015-2030 and in the 17 Sustainable Development Goals (SDGs) set to replace the Millennium Development Goals (MDGs) and set objectives also from 2015-2030. This paper deconstructs a sometimes vague discourse on resilience and asks how project work and associated outputs and outcomes in the genre can infuse decision making, policy and planning to contribute to reduction of inequalities and poverty in Africa and enhance clean sustainable development. It examines some of the work taking place already around the continent with concomitant impacts and how these efforts are intended to make positive changes to resilience. It also addresses some of the ironies and disconnections that exist between northern and southern discourses on resilience related topics that have stymied

and slowed progress at successive climate negotiations, for example in the debate on loss and damage in the years leading up to Paris. The paper concludes with a forward looking approach to the 2015-2030 resilience agenda that speaks to the theme of proofing African growth and development to weather and climate related stressors to enhance well-being for the wider population of the continent

Title: Capacity Development on Early Warning and DRR in Africa

Author: Prof. Bouafou Kouame Guy-Mercel

Title: Incorporating the Sendai Framework into National DRR Strategies - UNISDR

Climate Change and Energy 3: – Policy and Regulatory Frameworks – Chair, Prof. Yacob Mulugeta

Title: Coal mining and the transition to renewable energy in Africa

Author: Rose Mwebeza, Africa Mineral Development Centre - Special Initiatives Division - United Nations Economic Commission for Africa, e-mail: rmwebaza@uneca.org

The mining industry has traditionally relied on conventional fossil-based fuel sources — diesel, oil, coal and natural gas to meet its growing energy demand. However, the increasing fuel prices coupled with dropping commodity prices has resulted in the ever narrowing operating margins and increased opposition from communities to new energy sources. Additionally, the mining sector is facing growing demand from governments, customers, communities and other key stakeholders to operate in a sustainable manner. Doing so has a growing influence on the mining industry's "social license" to operate. Many of the world's largest mining companies are evaluating greater use of renewable energy plants; a trend set to intensify rapidly with the move to a more resource-efficient and low-carbon economy being one of the drivers for the post 2015 development Agenda. Current estimates indicate that the global demand for energy is set to grow by 36% by 2035. The implications for this growth in demand for the mining industry are significant because many mining sites are often located in remote areas that are not connected to the grid. Renewable energy applications are becoming an alternative. Both solar and wind power plants present an opportunity to contribute to saving energy costs at mining sites. In fact, it is estimated that renewable energy applications built at mining sites can lead to cost savings of up to 70%. One of the conventional fossil fuels that will be most impacted by this transition to renewable energy is coal. This is because coal has the highest uncontrolled carbon dioxide emission rate of any fuel. The conventional coal fuel cycle is among the most destructive activities on earth, threatening health, fouling air and water, harming land, and contributing to global warming. Dramatically reducing use of fossil fuels especially carbon-intensive coal is essential to tackling climate change. What this paper sets out to do therefore, is to examine the nature of coal mining in Africa, its contribution to emission of greenhouse gases and their deleterious impact and the options that exist for transitioning from coal mining as a source for energy to more efficient and more renewable energy sources for the mining industry in Africa. While the paper will principally focus on Africa, it will draw examples particularly of good practice in the transition from coal mining to renewable energy from other jurisdictions where there are positive developments in this regard.

Title: Financing sustainable energy infrastructure in Tanzania and Zambia

Author: Oliver Johnson, Stockholm Environment Institute, e-mail: oliver.johnson@sei-international.org

2015 marks a critical time for the international community to define its goals on both sustainable development and climate change. Vital to successful implementation in Africa of both the Sustainable Development Goals (SDGs) and any climate agreement at COP21 in Paris is a comprehensive financing framework for sustainable infrastructure that merges these two agendas. Despite growing efforts to do so, more evidence is needed to understand which financing models work to catalyse investments in sustainable infrastructure, and in which contexts. As part of the Better Finance initiative led by the Brookings Institute, the Stockholm Environment Institute (SEI) has carried out a study on financing sustainable energy infrastructure in Tanzania and Zambia. The study explores specific on-going national energy initiatives in order to gather insights on how financial and non-financial (i.e. organizational, regulatory and technical) barriers were overcome in order to realise these initiatives. The study includes a specific focus on climate finance. In Tanzania, we look at how investments in natural gas infrastructure provide an opportunity to improve energy security and energy access, whilst limiting greenhouse gas emissions to some extent. In Zambia, where the population is dispersed and the energy utility has difficulty reaching many households, we look at how investments in decentralized renewable energy options can improve energy access in an appropriate and climate compatible way. We will present results from the desk-based research and fieldwork interviews that are currently ongoing in both countries. the findings of the study will inform policy practitioners in government, private sector and civil society at the national and regional level.

Title: South Africa's Renewable Energy Independent Power Producer Programme (REIPPP)

Author: Lena Mangondo

Title: An Assessment of Policy and Institutional readiness for solar energy in South Africa

Author: Chipo Mukonza, UNISA, e-mail: mukonc@unisa.ac.za

Electricity supply constraints, pressure to decarbonise the energy industry, and goals for economic expansion have contributed to the growing demand for renewable energies and in particular solar. In response policies and institutions have been developed to promote solar energy. The study investigates the policy and institutional readiness in South Africa. The study is desk top and it made use of publicly available literature and documents. Contents and narrative analysis was used. The study found out that the PV industry is at the cusp of extraordinary opportunities, but challenges around financing, technology, and 'overcapacity' must be addressed. In South Africa a number of initiatives and policies have been made that promote solar energy, but South Africa faces challenges in manufacturing especially the glass component. South Africa faces stiff competition with suppliers from other countries with lower labour costs and higher labour productivity. The paper recommends that there is need to develop a marketing strategy in order to promote South Africa solar energy industry players and export opportunities.

Climate Change and Forest 2: Carbon Markets Democracy and Redistribution – Chair, Prof Chris Gordon

Title: Zonage des terres, conservation des paysages et représentation locale déboîtée en RD Congo

Author: Phil René Oyono, Rights and Resources Initiative, e-mail: rpoyono@gmail.com

La gouvernance climatique constitue un champ interactionnel et un corps d'arrangements institutionnels et financiers. La déclaration de Durban constitue un de ces outils. Approuv?e en marge de la Conf?rence des Parties (COP) de Durban en 2011 - par, d'une part, les pays du Bassin du Congo et, de l'autre, des partenaires techniques et financiers -, elle est significative d'un engagement commun en faveur de la mise en oeuvre de la REDD+ et l'élévation de la croissance verte dans la sous-région. La pr?sente communication fait l'économie politique de l'impl?mentation de cet outil par les parties prenantes. Le champ institutionnel du partenariat associ? avec la D?claration de Durban et les postulats constitutifs est travaillé par des convergences et des divergences, stratégiques et méthodologiques. C'est un espace de tensions et de luttes de pouvoir et de reconnaissance. Il y a donc un passage de l'économie a l'écologie politique et a la géo-stratégie climatique. S'appuyant sur des facteurs limitants, l'auteur recommande la conversion de la Déclaration de Durban d'un engagement collectif intentionnel a une action collective structurée.

Title: Representation in REDD: NGOs and Chiefs Privileged over Elected Local Government in Cross River State, Nigeria

Author: Emmanuel O. Nuesiri

Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) is a global climate change mitigation initiative. The United Nations REDD (UN-REDD) Programme is presently funding REDD+ readiness in developing countries including Nigeria-REDD programme. Nigeria-REDD is designed with sub-national pilot projects in Cross River State. Poverty in the pilot communities is above seventy percent; REDD+ may exacerbate poverty by restricting access to the forest. UN-REDD commits to strengthen local democracy as a safeguard to protect local people's socio-economic interests. UN-REDD frames democracy as stakeholder participation in governance. Stakeholder participatory forums were thus part of the consultative process during the design of Nigeria-REDD. Local people were represented in the design of Nigeria-REDD by customary authority and NGOs. Elected local authorities, the substantive representatives of local people were ignored. This paper draws attention to the gaps in the local governance framing in REDD+ especially with respect to the democratic representation of local communities.

Title: REDD Stakeholder Consultation – Symbolic or substantive democratic representation in preparing Uganda for REDD+?

Author: Robert Mbeche

Carbon forestry programmes are primarily focussed on emission reductions. They are also expected to build-in social safeguards to help ensure accountability, participation, transparency and legitimacy in resource governance. These safeguards promise inclusion of marginalized groups and forest-dependent people in decision making around resource governance – so that their interests can be represented. To what extent is this rhetoric of representation reflected in the design and implementation of carbon forest programs in Uganda? This article examines the choice of local institutions selected by carbon forestry projects and programmes for local partnership and the effects of these institutional choices on local representation. We find that despite espoused intentions of having an 'inclusive' involvement of communities and in particular local actors, all the four interventions that we studied chose to work through experts or via institutions that required individuals to be members (such as Community Based Organisations, NGOs etc.) if they were to benefit. The effect of these arrangements has been exclusion of the wider community, co-optation, contestation, conflict, unequal benefit sharing, lack of accountability or selected institutions being accountable to donors as opposed to communities. Clearly, claims to safeguard the needs and aspirations of local people in forest decision making are not sufficient – they have to be backed with conditions that make it necessary for broad public accountability and responsiveness to occur. The article reflects on how to broaden accountability and responsiveness in carbon forestry in Uganda.

Title: REDD+ Institutional Choices and their Implications for Local Democracy in the Kasigau Corridor, Kenya, Susan Wangui Chomba

Author: Susan Chomba

Reduced Emissions from Deforestation and Forest Degradation, plus forest conservation, sustainable management of forests and enhancement of carbon stocks (REDD+) has been promoted as a mechanism that goes beyond increasing forest carbon stocks, to address social and livelihood needs of forest-dependent communities. REDD+ safeguards, formulated under the United Nations Framework Convention on Climate Change (UNFCCC), aim at protecting the weak and vulnerable people from harmful effects as a result of REDD+ Implementation. This paper critically examines the provisions of the safeguards with the objective of identifying their strengths and weaknesses. It uses the case of Kasigau corridor REDD+ project in Kenya to compare the provisions with practical REDD+ implementation. The findings reveal that although the safeguards provide a broad framework within which violations to social and environmental equity and justice can be reported, it is not clear whom they should be reported to and the available mechanisms of recourse at the local, national and international levels. Safeguards are also not specific on historical injustices on tenure, which largely determine who benefits and loses from present implementation of REDD+. Furthermore, the safeguards are only practically applicable to countries that wish to receive result-based compensation for REDD+ through the UNFCCC process. Private sector initiatives, such as the one under study here, are therefore not directly obliged to adhere to, and report on the safeguards under the UNFCCC process. They can only report the extent to which they adhere to them through their certifying bodies, a process that so far has yielded minimal protection against injustices. The paper therefore reveals critical weaknesses of the REDD+ safeguards that leave vulnerable people exposed, and suggests ways for improving them.

Agriculture, Trade and Food Security – Chair, Dr. Maggie Opondo

Title: The Water-Food-Energy Nexus in a Changing Climate

Author: El Mostafa Jamea (Lead author), Driss Zejli and Fouad Lahlou, MENA Renewables and Sustainability - MENARES institute, e-mail: mostafa@mena-renewables.com

In a changing climate, pressure on water and natural resources and demand for food and energy are increasing in Africa. Since energy, water and food are dependent among each others, any deficit on one resource will impact the others. For this reason, the water-food-energy nexus is gaining a significant importance among decision makers, experts, academia and the wide public interest as well as from other climate change stakeholders. The present paper explores briefly the dimensions of the water-food-energy nexus in Africa, its main aspects, the challenges that put on the African continent and eventual opportunities which create. We also analyse Morocco as a case study, and then explores the policy aspects that address this issue in Morocco, with statement of best practices and eventual learned lessons from other African countries. Particularly, the water-food-energy nexus in Morocco is analyzed combining desktop study and experts inputs in order to assess its dimension, and evaluate decision makers' perceptions and consideration of the nexus with regards to the main challenges and opportunities, as well as how could policy address it in short and long terms. The main findings focus on the importance to shift our productive systems to more sustainable approaches, as well as to promote sustainable energy and enhance energy efficiency use. In addition, policy plays a key role in addressing the nexus, and policy response, coordination among the different stakeholders and governance are the key messages to be taken consideration in order to address effectively the nexus.

Title: Estimating the Spatial Effects of Climate Change on Food Production Capacity in ECOWAS

Authors: Calvin Atewaba, UNU-INRA, e-mail: atewamba@unu.edu

Climate change will affect land productivity in agriculture. Estimates of land use gaps, the magnitude and variability of difference between agricultural land use potential and actual farm land use, will support policy development to improve food production under climate change. Reliable location-specific estimates of land use gaps are available only for a limited number of geographical units in ECOWAS due to cost and time required for field studies or for obtaining data on long-term weather, soil properties, water availability, and crop rotations and management practices. To fill this knowledge gaps, this paper proposes an agricultural land allocation model for ECOWAS that captures key environmental and socio-economic characteristics of the region such as climate, soil, hydrology, cropping systems, crop managements and national markets. We first delineate 39 Agro-Climatic Zones (ACZs) in ECOWAS to cover 80% of crop area and climate homogeneity within zones using the approach proposed by Global Yield Gap Atlas Extrapolation Domain (van Wart et al., 2013). Then, we attribute three main soil types to each ACZ to delineate 117 Agro-Climatic and Soil Zones (ACSZs) with climate and soil homogeneity within zones suitable to upscale food production capacity in ECOWAS. Finally, we develop a dynamic inter-temporal and spatial ECOWAS whole farm model, in which a representative whole farm is a small-medium scale farmer operating in an ACZ as unit. Farming system is characterized by 7 cropping systems mainly paddy rice; cereal; vegetable-fruits-nuts; oil seeds; sugarcane-sugarbeet, fibers and indigenous crops and 4 livestock breeding systems namely cattle, sheep, chicken and other. The ECOWAS farm agents' objective is to allocate the available agricultural land to different usages in order to optimize the farming activities profits under different climate conditions. The model is calibrated for 2004 and use to predict the spatial food production capacity in ECOWAS by 2050 under two climate scenarios derived from RCP 8.5 and RCP 4.5. Results show that climate change will significantly affect agricultural land allocation in ECOWAS by 2050. There is a need for policy makers to support famers in ECOWAS to progressively shift to a more optimal agricultural land allocation by 2050 in order to improve their food production capacity as a result of climate change.

Title: Agricultural Production, Climate Change, Agricultural Trade and Food Security in EAC

Authors: NM. Laibuni, A. Muluvi, E. Mukhala, J. Ngaina, N. Maingi, R. Mulwa, M. Omolo, C. Onyango, J. Nyangena, S. Githuku and J. Omiti; Kenya Institute for Public Policy Research and Analysis (KIPPRA); e-mail: nmunyiva@gmail.com

There is a strong link between climate change, agriculture, trade and food security in the East African region. This is because agricultural production is mainly rain-fed thus heavily dependent on climate. The study aimed to establish evidence on the impact of climate change on agricultural systems, trade and food security. The results show that the temporal pattern of rainfall over EAC has a strong inter-annual rainfall variability associated with extreme events such as floods and droughts. Implying that production will be largely affected negatively with some pockets reporting bumper harvests. The yields gaps in the region are wide compared to production implying the there is room for productivity gains. With varying food production due to climate change, food security can only be guaranteed if the trade policies in the region do not impede smooth flow of imports and exports in the region. In terms of policy direction the farmers face a number of agricultural policies in individual countries, and also region wide policies which influence the way they practice agriculture. These policies mainly influence the input use in the farm and thus directly affect production. Policies which are adverse to agricultural production would have more devastating effects when compounded with adverse impacts of climate change. While climate change is a global phenomenon, potential effects are not expected to be uniform; rather they are unevenly distributed, both between and within countries.

Title: Analysis of Agricultural Commodities Value Chains and Greenhouse Gas Emission in Rice and Maize in West Africa: Impact on Food Security

Author: Nasirrou Ba, UNECA, Ethiopisa, e-mail: Nba@uneca.org

Date: 30 October 2015 - Day 3

Time: 09:30-11:00

Solution Forum 7: Gender – Chair, Thierry Amoussougbo

Title: Enhancing community radio for gender equality empowerment for climate change policy awareness campaigns for sustainable development in Africa

Developing Effective Media Coverage of Climate Change Benefits and Prospects for Achievement of Sustainable Development Goals in Africa by 2030

Author: Prof. Wilson Okaka, Kyambogo University, e-mail: nupap2000@yahoo.com

The media have a social responsibility to provide effective coverage of climate science information services for climate change adaptation, resilience, and mitigation policy strategies in Africa. Enhanced media coverage of climate change issues is vital for narrowing the current policy, research, knowledge, skills, and practice gaps; and for building resilience against the loss or damage to maximize the benefits and opportunities of climate change. The objectives of this review are to: (1) present the opportunities or prospects of climate change information services for SDGs; (2) explain the benefits of SDGs, indicators, and targets in managing climate change loss and damage management strategies;(3)discuss the social responsibility of the media in creating, raising, developing, sustaining, monitoring, and evaluating public awareness, understanding, and practice of mainstreaming climate information into SDGs; and (4)examine the emerging prospects of capacity building and enhancement for the media, local communities, civil society, policy-makers, researchers, climate institutions, the private sector, and SDGs partners. Results indicate that Africa still lack basic: climate information communication services, public awareness of accessible climate information, understanding, capacity to use climate information, facilities, infrastructure, and ability or willingness to infuse climate change data into development plans. Besides, climate change information is not integrated into regular media coverage or news bulletins due to weak or lack of capacity or awareness. And, poor communication, coordination, and cooperation among the policy-makers, researchers, public, and media undermine climate science communication in Africa.

Title: Gender and the deployment of social resources in adaptation to climate variability in the Sahel zone of Nigeria

Author: Dr. Jummai Yila

Title: Gender-Sensitive Actions incorporation into the Health Sector of Ghana - pilot project

Author: Dr. Nana Ama Browne Klutse

Title: Impact of increasing global temperature on Ghana's climate

Author: Dr. Nana Ama Browne Klutse

Title: New crops for a new climate: how does gender matter for the adoption of sesame crop in West African Sahel?

Authors: Kaazangan Ouedraogo and Rivaldo AB. Kpadonou, Recherches Participatives pour le Developpement (RRP), e-mail : rash.ouedraogo@gmail.com

In the context of changing climate patterns and the demand for alternative drought-resilient crops, farmers' interest in sesame is increasing in the West African Sahel. Sesame is suitable to in drought-prone areas and relatively unfertile soils. But adopting this new cash crop in areas where people are facing serious risks of food insecurity involves some gendered aspects. Using both single and two-person cooperative decision-making frameworks, we analyzed gender patterns and particularly the role of woman in the household's decision making process regarding the adoption of sesame, as a new drought-tolerant cash crop, using a case study involving 500 households in West African Sahel. The findings highlight two major gender patterns of the household's decision of adopting new drought-tolerant cash crops in drought-prone areas. First, female-headed households are less likely than male-headed households to move towards a new cash-crop, and this is related to the more limited control of female-headed households over productive resources, but also to the woman's core responsibility and interest in food crops for the purpose of the household food security. Second, within male-headed households, greater women control over land leads to greater probability to adopt sesame as a new drought-tolerant crop within the farm. Putting these findings in the framework of the exiting literature on gender and economic theory provides some interesting insights towards policies to enhancing women role within the household as well as increasing farmers' resilience to climate change in drought-prone areas. Woman, either in male-headed or female-headed household, may be allocating their resources towards food crops for the purpose of the household food security, and this may ease the man willingness to move towards a new cash crop. However, such cooperative or strategic behavior is not possible within female-headed households, which are facing more resources constraints. These findings suggest that enhancing cooperation between man and woman within male-headed-households can lead to a better household resource allocation and resilience to climate change in drought-prone areas, while special measures are needed to enhance the adaptive capacity of female-headed households.

Governance 4: Lesson learnt and emerging views from INDCs – Chair, Dr. David Lesole

Title: The land use sector and INDCs within the UNFCCC

Author: Kalame Fobissie and Johnson Nkem, University of Helsinki (Finland), e-mail: fobissie.kalame@helsinki.fi

Parties to the United Nations Framework Convention on Climate Change (UNFCCC) are expected to adopt a new and legally binding climate agreement during the Paris climate conference in December 2015 (COP 21). Intended nationally determined contribution (INDC) is expected to be an important determinant of any successful global climate agreement. The land use, land use change and forest (LULUCF) sector in the INDC provide huge opportunities for countries to implement activities that can contribute to global efforts in reducing greenhouse gas (GHG) emissions. Submitted INDCs indicate that (i) many countries are not yet ready to declare their contributions in the forestry, REDD+ and LULUCF sector; (ii) developed countries have the lowest visibility of forest and forestry in their INDCs while developing countries have the highest visibility; (iii) LULUCF activities are not clearly linked to emission reduction targets; (iv) Adaptation and mitigation synergies are promoted through forest ecosystem services. And some African countries are willing to make adaptation and mitigation contributions in the LULUCF sector provided there are means of implementation. The paper further discusses the implications for Africa.

Title: Climate Negotiation and Intended Nationally Determined Contribution in Africa (INDC)

Author: Constant Labintan, Houdegbe North American University, e-mail: donconstant@yahoo.fr

The 19th Conference of Parties in Warsaw (2013) was one of the important progresses made in climate negotiation by inviting all parties to initiate or intensify their domestic preparations for their Intended Nationally Determined Contribution (INDC) and communicate that well in advance of COP21 in Paris in a manner that facilitates the clarity, transparency and understandable. Despite the low contribution of African countries to global emission, in line with the call several African countries have submitted their draft manifesting their willingness to contribute to global effort to combat climate change. Thus, this paper aims to assess the effectiveness of INDC in African countries and they real contribution toward the global effort in forthcoming climate negotiation. Doing so, the first part assess the sectoral contribution of each African countries mainly in agriculture, land use change, energy , transport in comparaison to their Business as Usual scenarios and theiry related needed resources in term of technology transfer and financial budget. While the second part use scoring system for decision making to analysis whether each country's INDC followed criteria such Comprehensive domestic process; High level of transparency; Comprehensive content; High level of ambition; Tracking sustainable development co-benefits for both adaptation and mitigation target.This will finally be used to compute an effectiveness index to enhance country effort in mainstreaming global climate change. The third part conclude and give recommendation and action plans on how country could improve their effort and take advantage on this opportunity to enhance African position in forthcoming international climate negation and improved decision making for the continent resilience.

Climate Science 4: Climate Science and Policy Applications, Chair, Dr. Laban Ogallo

Title: Performance of the CMIP5 Models in Simulation of the Present and Future Precipitation over the Lake Victoria Basin

Author: Maureen Wanzala, IGAD Climate Prediction and Application Centre (ICPAC), e-mail: manyango03@gmail.com

The usefulness and limitations in climate information are due to uncertainty inherent in the climate system. The reduction of errors increases the reliability of the information. Therefore, for any given region to have sustainable development there is need to apply climate information into its socio-economic strategic plans. The overall objective of the study was to assess the performance of the Coupled Model Inter-comparison Project (CMIP5) over the Lake Victoria Basin. The data used in the study included the observed point station data, gridded rainfall data from Climate Research Unit, University of East Anglia (CRU) and hindcast data from eight Coupled Model Inter-comparison Project 5 (CMIP5) for the period 1971 to 2005 for historical and 2006-2100 for model future projections. The methodology employed included trend analysis, spatial analysis, correlation analysis, Principal Component Analysis (PCA) regression analysis, and categorical statistical skill score. Analysis of the trends in the observed rainfall records indicated an increase in rainfall variability both in space and time for all the seasons. Similarly, majority of the eight models analyzed correctly reproduce the mean seasonal and annual cycle of precipitation for the period 1971-2005 as compared to gridded satellite-derived observations. At the same time the analysis shows significant biases in individual models depending on region and season. Specifically, a modest number of models were able to capture correctly the peaks of bimodal (March - May and October - December) and June - August rainfall while a few either dragged the onset to subsequent months or displaced the locations of seasonal rainfall. The spatial patterns of the individual models output from the models of MPI, MIROC, EC-EARTH and CNRM were closest to the observed rainfall patterns.

Title: Analysis of extreme temperature indices of long-term homogenised temperature series in South Africa

Author: Mthobisi Nxumalo, South African Weather Service, e-mail: nxumalo.mthobisi@gmail.com

An understanding of climate trends is key to understand the potential impacts of climate change in relevant socio-economic sectors, and implications on sustainable development. The analysis of historical climate trends is also important for the verification of models which estimate future climate trends. Homogenised data reduces the risk of significantly biased results in historical climate trend analysis. For the first time, homogenised maximum and minimum daily temperature data sets for South Africa, spanning from the period 1931 to 2014, are utilised to analyse long-term historical temperature trends. Previous extreme temperature trend analyses for South Africa only covered periods from 1961, which does not only make the current analysis significant in terms of the period of analysis but also in terms of the number of stations utilised. Whereas previous studies covered the analyses of the time series of fewer than 30 stations, the combinations of data from different stations in single time series through homogenisation increased the number of time series' to 36. The time series' were analysed using extreme temperature indices developed by the WOM-ETCCDI team, which makes it possible to compare the results to other analyses across the world. Examples of the index trends analysed include the annual number of cool days, annual number of warm days, diurnal temperature range, annual maximum and minimum temperatures, warm and cold nights and annual maximum warm spells, amongst others. This analysis forms part of the ongoing study in historical temperature trends in South Africa from in-situ measurements by the South African Weather Service.

Title: Simulating agricultural land-use adaptation decisions under changing climate using multi-agent system model in the Semi-Arid Ghana

Authors: M.L. Amadou and G.B. Villamor, AGRHYMET Regional Centre, e-mail: laouali@gmail.com

This research focuses on the implementation of the multi-agent system (MAS) model for investigating the traditional adaptive strategies in the semi-arid Region of Ghana by considering farmers' perception of climate change and variability. In order to achieve this, Land Use Dynamic Simulator (LUDAS) approach was adapted and modified by integrating the two step-decision making sub-models. This modified version of LUDAS called SKY-LUDAS was constructed to capture the empirical heterogeneity of farm household agents, landscape agents, and also to explicitly simulate interactions between these two agent types. From the results of the multivariate statistical methods, three farm household agent groups were identified. Also the factors explaining the decision of these three household agent groups on the choice of the six identified land-use types were analysed. Two sub-models were developed and calibrated for implementing the two-step decision making sub-models: Perception-of-Climate-Change and Adaptation Choice strategies. Simulation results of SKY-LUDAS suggested that the land-use behaviour in the study area reflects a tendency of subsistence farming. In terms of farm-households' livelihood strategy, especially the structure of the gross income, there was a growing contribution of rice and groundnut. Also the pattern of the gross income under the scenario of perception on climate change (PCC) showed explicitly the contribution of the adaptation options in the households' livelihood strategy. Accordingly, SKY-LUDAS has revealed a gradual shift among land-use types from traditional cereals farming to the cultivation of groundnuts, rice, maize and soybean. Based on the two-step decision mechanism, this research answered the question on whether some adaptation practices are stimulated by climate or other factors.

Title: Evaluation of remotely sensed and forecasted rainfall data for flood early warning in data scarce area in Niger Basin: Benue Sub-Basin, Nigeria

Author: Alemseged Haile Tamiru, International Water Management Institute (IWMI), e-mail: A.T.Haile@cgiar.org

Lack of information about extreme floods ahead of their occurrence has caused severe damage and loss in many parts of Africa. The problem can be exacerbated as a result of climate change. The objective of this study is to set-up parsimonious flood forecasting model as an input to flood warning in the central part of Nigeria. The HEC-HMS rainfall-runoff hydrological model was evaluated. To overcome the issue of data availability, we evaluated the high resolution (TRMM-3B42 operational) satellite rainfall product for model calibration while real time (TRMM-3B42RT) and forecasted (ECMWF) rainfall products were tested for flood forecasting. The implication of removing the systematic errors of the satellite rainfall data was explored. Performance of the rainfall-runoff model was assessed using a set of performance indicators. We defined three flood warning threshold levels (Medium, severe and very severe) for 1 to 6 days lead time. The forecast skill was assessed using categorical verification statistical such as Probability Of Detection (POD), Frequency Of Hit (FOH) and Frequency Of Miss (FOM). The model performance was satisfactory in terms of reproducing the historically observed river flows of Benue. Overall, our results show that satellite based rainfall product and rainfall forecasts from a numerical weather model are important for data scarce areas and crucial input for real-time flood forecasting. However, we suggest removing the systematic error of satellite rainfall products to further improve flood forecast skill. Forecast accuracy can also be further improved by increasing access to data from more rain gauges in upstream riparian countries.

Climate Change and Youth – Chair, Veronica Gundu

Title: Energy Access: Focus on Women and Youth in East Africa

Author: Jessica Mukiri, Kenyatta University, e-mail: jmukiri@gmail.com

Africa is known to be energy deficient with the sub-Saharan region being home to over 70% of people without access to electricity and depending on biomass as a primary source of energy. In recent years there have been several advances to mitigate the energy crisis within Africa, particularly crises around access and sustainability. These advances range from investing in renewable energy to improving energy infrastructure in rural areas.Currently countries within East Africa have a blueprint on increasing their energy capacity keeping in mind the threats that climate change poses with countries such as Ethiopia, aiming to be carbon neutral by 2025. These plans are promising and project great potential outputs for countries within this region This paper analyses the state of energy access within the Eastern African region, focusing on inclusiveness and bridging the gap between marginalized groups which include women and youth, and the access they have to tools such as finance, education and technology when accessing energy. This paper relies on primary research, which includes more than 20 interviews with a range of stakeholders including but not limited to government, civil society, youth and women organisations. Secondary data was collected from but not limited to internet,journal articles and reports on energy access and sustainability.Using this data, this paper aims to draw an analysis of the current state of inclusiveness in energy access among women and youth in East Africa with the aim of highlighting and recommending best practices to achieve inclusivity in energy interventions within the region.

Title: Migratory Patterns and Differential Vulnerability as Adaptation to Climate Variability and Resource Degradation: Case Studies of Rural Youth Outmigration in Ethiopia

Author: Yordanos Estifanos, University of Oldenburg (Germany), e-mail: melkamgize@gmail.com

Ethiopia is moving toward the middle stages of the demographic transition, but one of the major constraints to reaping the potential demographic dividend is increasing variability of climate, especially drought. Based on empirical case studies in different agro-ecological zones of Ethiopia, this study examines opportunities and prospects thrown open by climate change. By integrating less researched topics of Youth migration, Gender, and Climate Change, the study provides a different perspective for development under a changing climate. The study analyzes youth outmigration, their differential vulnerability and adaptive capacities. One of the major strategies employed by the youth and young adults are temporary and permanent migration, both internal and international. The results indicate quite different migration patterns for boys and girls, for drought-prone and forested areas, for food insecure families, and for ethnic groups. Certain migration patterns strengthen human development capacity and mitigate the effects of climate variability and resource degradation. Those planning to migrate within the year are more affected by shocks to the environment, whereas long-term migrants tend to benefit more from education and skill development strategies thereby contributing for sustainable development. Policy wise, the current Ethiopian Population Policy that restricts rural urban migration should be reconsidered to encourage the more beneficial migration patterns that would reduce the demographic differential vulnerability to drought.

Title: Youth Mainstreaming in Climate Change and Sustainable Development Policy Process: A compendium of Actions, Contributions, and Prospects for African Youth Inclusion

Author: Grace Mwaura; Ibrahim Ceesay; Lawrence Muli; Nkiruka Nnaemego; Sylvia Wachira; Rehema Kimulu; Urias Goll; Billy Lombe Grace, African Youth Initiative on Climate Change (AYICC), e-mail: mwauragrace0@gmail.com

In this paper, we evaluate the nature of African youth engagement in climate change negotiations since 2006 led by the African Youth Initiative on Climate Change and other youth led organizations; evaluate the impacts of country-level contributions of African youth to climate change and development programmes; and provide insights for a youth analysis framework to the COP

21 African position and beyond leveraging on the African climate policy discourse, the African Union Agenda 2063 and Africa's common position on the Post 2015 Agenda. Our analysis of youth contributions to climate change policy and advocacy indicates a sustained momentum in their participation despite limited access to information, mentoring, and financial resources. Country-level youth initiatives on climate change and sustainable development span over 40 African countries where AYICC has chapters leading to a continental-wide movement creating awareness, building capacity and influencing grassroots change. We map these national chapters and highlight some of their success stories in sustainable agriculture, clean energy, and environmental conservation. The continued efforts of the African youth movement, coupled with the growing need to create an enabling environment for sustainable youth livelihoods while addressing the adverse impacts of climate change presents a unique learning opportunity for partnerships among governments, private sector, civil society, academia, and youth. We recommend enhancing such partnerships by increasing African youth capacity to meaningfully contribute to policy-making, programme implementation and monitoring, which indeed offers enormous benefits to the continent: inclusive approaches to climate change adaptation and mitigation; decent youth livelihoods; and a sustained economic growth.

Title: Forecasting of the agricultural calendar for the culture of corn from models of global circulation of the atmosphere in the Plain of the Ruzizi

Authors: Romain Mutalemba, Jean Berckmas Muhigwa , Mukengere Bagula Espoir; African Youth for Entrepreneurship and Devellopement, e-mail: ntoleromeo@yahoo.fr

The world is confronted to several major challenges of which the answer to the present economic crisis and the applicable strategy development to attenuate the ominous effects of climate change .That's the way this survey had how objective to foresee an agricultural calendar from the climatic local station data adapted to models of global circulation of the atmosphere. The methodology adopted for this survey rested on the analysis of the evolution of the climate in answer to the different dangers incurred by the agriculture of the plain of the Ruzizi while considering the culture of the corn in the evolution of her agricultural calendar. The mathematical equations lasting a period of 30 next years for local station data have been generated. Of this analysis, it has been noticed that the climatic variables (temperature, precipitation) would present some meaningful variations according to Scripts during next thirty years (of 2015 to 2045);it had observed itself that the distribution of the precipitation has sudden a strong modification among the period of before and according to 1995, from where the agricultural calendar for the corn foresees a period of plantation to the month of November instead of September to get round the strong falls of rain to the month of October.

Solutions Forum 6: Sustainable Development

Title: Improving accountability for adaptation finance: lessons from tracking adaptation finance to local level in Zambia and Uganda

Author: Annaka Peterson Carvalho, Oxfam, e-mail: acarvalho@oxfamamerica.org

Mainstreaming climate change into development planning sounds like a good idea. It's what everyone is talking about: Climate negotiators debate the national adaptation planning (NAP) process, which focuses on integrating climate change adaptation into existing policies and programs; President Obama called for the integration of climate resilience into all development assistance in an Executive Order; and, the Commissioner for Infrastructure and Energy for the African Union discussed mainstreaming at the Africa Climate Resilient Infrastructure Summit. But translating the concept of mainstreaming into an effective way of addressing the adaptation needs of vulnerable communities requires action at multiple levels. This paper will build upon findings from research tracking adaptation finance to local community level in Zambia and Uganda and set out an agenda for translating the concept of mainstreaming adaptation into development planning into an effective enabling environment for building the adaptive capacity and resilience of communities vulnerable to the impacts of climate change.

Title: Community radio for smallholder farmers to overcome poverty

Author: Mr. Nnaemeka C. Ikegwuonu

Title: Using Knowledge Management Techniques to Enhance the Role of African Politicians to Access and Use Climate Change Information for Sustainable Development

Author: Yassin Mkwizu, Institute of Resource Assessment - University of Dar es salaam, e-mail: yassin.mkwizu@gmail.com

The newly greed Sustainable Development Goals (SDGs) has climate change as one of the goals. Consequently, new opportunities for Africa may be available for Africa in the process of SDGs implementation. For example, the report of a study by stakeholder forum on Universal Sustainable Development Goals - Understanding the transformational challenge for developed countries shows that climate change goal is one of the three most transformational challenges, which would need more emphasis for action. Further, the Briefing Paper 18/2012 of the German Development Institute points out that, although both SDGs and Millennium Developed Goals (MDGs) have common elements, the SDGs approache poverty as a goal to be addressed and this creates concerns especially for poor counties that poverty reduction may be treated as a secondary issue. Therefore, for the

continent to benefit from new climate change initiatives, African leaders need to get knowledge and understanding on the way newly agreed SDGs differ from the former (MDGs) in relation to opportunities and threats they both present. This paper examines the role of knowledge management techniques for politicians in Africa in enabling them to use the opportunities of newly agreed SDGs for climate change. The paper is based on a study carried out in Tanzania to examine the contribution of storytelling presentation in enabling access and sharing of climate change information and knowledge to politicians. Results from this study have shown that the combination of both conventional and storytelling presentation techniques targeting politicians can enhance their level of access and use of climate change information and data.

Title: Utilisation des informations climatiques dans la prévention et la gestion communautaires des risques climatiques : cas des communautés rurales du département de Dakoro au Niger

Author: Adamou Mahaman Moustapha, Faculty of agronomy - Abdou Moumouni University, e-mail: moustapha_a@yahoo.com

Pays sahélien, le Niger connait depuis 1970 des sécheresses répétitives, une croissance démographique accélérée et une surexploitation des ressources naturelles, qui ont mis en crise les activités rurales et particulierement l'agriculture et l'élevage. Le changement climatique a bouleversé le relatif équilibre homme/milieu naturel mettant a l'épreuve les communautés rurales. Pour les éleveurs, les sécheresses et la dégradation du milieu se sont traduites par un amenuisement du bétail et pour les agriculteurs par une baisse drastique des rendements engendrant une insécurité alimentaire chronique. La réponse aux impacts du changement climatique passe par l'identification des stratégies communautaires d'adaptation a travers un processus de prospection des stratégies novatrices a appuyer pour renforcer la résilience au changement climatique. Ainsi, depuis quelques années, des actions sont menées de maniere endogene ou non pour réguler le dysfonctionnement des systemes de vie engendré par le changement climatique. Le département de Dakoro est situé dans une zone semi-aride avec une pluviométrie annuelle moyenne de 300 mm ou l'équilibre des systémes traditionnels de production est durement entamé. La mise a la disposition des informations climatiques (pluviométres et prévisions saisonniéres) a permis aux communautés rurales d'une part de mieux asseoir des strat?gies d'adaptation et d'autre part d'am?liorer le dispositif local de prise de d?cisions afin de prévenir les risques de catastrophe. Les stratégies d'utilisation des informations climatiques développées par les communautés rurales du département de Dakoro peuvent etre répliquées dans d'autres zones sahéliennes.