



AFRICA CENTER OF EXCELLENCE IN PHYTOCHEMICALS, TEXTILE AND RENEWABLE ENERGY (ACE II - PTRE)

**Virtual International Conference on Phytochemistry, Textile &
Renewable Energy for Sustainable Development**

12th to 14th August 2020

Conference Theme:

Advancing Science, Technology and Innovation for Industrial Growth

Venue: VIRTUAL CONFERENCE

Host: Moi University, Eldoret, Kenya



Ethiopia



Kenya



Malawi



Mozambique



Rwanda



Tanzania



Uganda



Zambia

CONFERENCE PROGRAMME BOOK

August, 2020

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BRIEF ABOUT MOI UNIVESITY

Moi University was established in 1984 by an Act of Parliament (Moi University Act, 1984) as the second public university in Kenya. This was on the recommendation of a Presidential Working Party, chaired by Prof. Collins B. Mackay, which had collected views from Kenyans about the desirability of the same. Courtesy of his deep and altruistic concern for and interest in the advancement of education at all levels in Kenya, not only as a professional teacher but as Kenya's Head of State, President Daniel Toroitich arap Moi pioneered the idea of a university in a rural setting. He, like most Kenyans, had good reasons for this. Among them was the need to decentralize higher education from Nairobi to other parts of the country. The former president felt time had come to create another university away from an urban environment. Not surprisingly Kenya's second university bears his name. That is a modest tribute to a great and deserving Kenyan. The University was, therefore established with an intention of making it a science, technology and development-oriented institution which would focus on problems of rural development in its training and research programmes. The first group of students, 83 in total, was admitted on October 1, 1984 through a transfer from the Department of Forestry of the University of Nairobi, which formed the initial one faculty in 1984. The University Act of 1984 was repealed and replaced by the Universities Act No. 42 of 2012, which is the one in current use. Under this Act, the Cabinet Secretary for Education, Science and Technology has considerable powers over the operations of both the public as well as private universities. The University is located in Kesses, 35 kilometers from Eldoret Town, and 310 kilometers Northwest of Nairobi, the capital city of Kenya. Moi University has expanded tremendously over the past decade and this can be attributed to the commitment of the entire Moi University fraternity, government investment, strategic partnerships, and the visionary leadership of the University Council and Management. These achievements are a testament of the resilience and fortitude of every faculty and staff member who enabled change at a pace and on a scale never experienced before in the country. Since 1984, the University has experienced phenomenal growth leading to the establishment of several constituent colleges across the country, many of which have since grown to fully fledged Universities namely Maseno University, Masinde Muliro University of Science and Technology, Maasai Mara University, University of Kabianga, University of Eldoret, Karatina University and Rongo University and Garissa University. Currently, the University has two constituent colleges namely Bomet University College in Bomet County and Alupe University College in Busia County. It has the following Schools, Education, Arts and Social Sciences, Business and Economics, Agriculture and Natural Resources, Information Sciences, Engineering, Medicine, Public Health, Nursing, Dentistry, Law, Tourism, Hospitality and Events Management, Sciences and Aerospace Studies. The University has the following Institutes: Institute of Postgraduate Studies, Confucius Institute and Institute of Open and Distance Learning. From 83 students in 1984, the University currently has a student population of 39,786 with a staff component of 3,000 being both academic and administrative. In addition, the University has satellite campuses: Nairobi campus, Mombasa campus, Eldoret West Campus and Annex Campus located about five kilometers from Eldoret Town. <https://www.mu.ac.ke/>.

BRIEF ABOUT AFRICA CENTER OF EXCELLENCE IN PHYTOCHEMICALS, TEXTILE AND RENEWABLE ENERGY (ACEII – PTRE)

ACE II, PTRE was established after a successful application of World Bank funding during the African Center of Excellence II bidding by Eastern and Southern African states. It is one of the 24 African Centers of Excellence funded by the World Bank ACE II Project that aims to provide high quality training and research within the African Region. The main objective of ACE II, PTRE is to train highly skilled manpower in Phytochemicals, Textile, Industrial and Renewable Energy through research, innovation and technology transfer for enhancement of the manufacturing sector. As a regional Center, PTRE mission is focused on providing highly trained, skilled and empowered human capacity with the potential to develop innovative products of high value and quality, offer services and solutions for the manufacturing sector. (<https://excellencecenter.mu.ac.ke/>)

BRIEF ABOUT SINO-AFRICA INTERNATIONAL FORUM ON TEXTILE AND APPAREL & SINO-AFRICA CULTURAL EXCHANGE FORUM (SAISTA)

SAISTA & SACEF are funded by the program of “20+20” Cooperation plan for Chinese and African Institutions of Higher Education, the first conference which was co-hosted by Moi University and Donghua University was held in 2015. Since then, the conference has been providing the platform for the communication in the field of textile and fashion design industry between China and Africa.

CONFUCIUS INSTITUTE AT MOI UNIVERSITY

Co-established by Moi University and Donghua University, China. Confucius Institute at Moi University has been promoting Chinese language and Culture among the students of Moi University and local citizens. More than 30 students from Moi University have pursued studies in China with Confucius Institute Scholarship. As the first Confucius Institute featuring textile and fashion design across the world, Confucius Institute at Moi University serves as a platform for promoting the collaboration and dialogues in the field of textile and fashion design between China and African.

**REMARKS BY AMBASSADOR SIMON NABUKWESI, PRINCIPAL
SECRETARY, STATE DEPARTMENT FOR UNIVERSITY EDUCATION
AND RESEARCH, MINISTRY OF EDUCATION**



Ladies and Gentlemen,

I am indeed delighted to participate in this Virtual International Conference. I thank the Vice Chancellor of Moi University for the invitation. This Conference is coming at a time when the world is going through health, economic and social turmoil due to the impact of Covid-19 pandemic which is affecting the entire world. Such challenges come with lessons to be learned. One such lesson is the reassertion that the world is more networked than ever before. Challenges facing one side of the world affect the entire world and need concerted effort of each and every one of us in the whole world to find possible lasting solutions. The Covid-19 pandemic has made us learn that no nation or individual has monopoly of knowledge, and the world is always a work-in-progress. It has also made us learn the important roles our health professionals play in our lives.

Fighting Covid-19 requires a collaborative scientific and interdisciplinary approach, ranging from efforts in developing a vaccine against it, curative and prevention measures, to social distancing and protective equipment. In these, social, biological and physical sciences are all applied. The Ministry of Education is at the forefront in developing capacity in Science, Technology and Innovation through provision of research funds which are competitively awarded to researchers. However, such funding is never enough and to mitigate this, the Ministry has provided an enabling environment for Universities to seek additional funding from the global community to bridge the funding gap and ensure they are relevant in so far as education and research are concerned.

I take this opportunity to thank the World Bank for the support they have given in the establishment of three (3) Africa Centers of Excellence (ACEs) in Kenya, i.e.

- i. Africa Centre of Excellence in Sustainable Agriculture and Agribusiness Management (CESAAM) at Egerton University,

- ii. Africa Center of Excellence in Phytochemicals, Textiles and Renewable Energy (**ACEII-PTRE**) at Moi University and,
- iii. Africa Center of Excellence in Sustainable Use of Insects as Foods and Feeds (**INSEFOODS**) at Jaramogi Oginga Odinga University of Science and Technology.

It is from this support that Moi University is able to offer postgraduate teaching and research in Phytochemicals, Textile and Renewable Energy.

The theme of the Conference: “**Advancing Science, Technology and Innovation for Industrial Growth**” and the thematic areas of Phytochemistry, Progressive Textiles, Renewable Energy and Transformative Industrialization are relevant in realizing Sustainable Development Goals (SDGs), which is a universal call for action to end poverty, protect the planet and ensure people enjoy peace and prosperity by the year 2030. A better world requires an interdisciplinary approach by including social sciences, of which this Conference embraces, having incorporated Sino-Africa Culture Exchange (SACE), making it a three-in-one International Conference with a high level academic discourse and cross-cutting disciplines. As I conclude, I wish to state that post Covid-19 will require us to build new bridges in scientific cooperation and re-double our efforts in Science, Technology and Innovation with determination and distinction. Universities are expected to lead in this aspect.

It is now my honour to officially declare the Conference open and wish all the participants effective presentations and productive discussions.

Thank you

Ambassador Simon Nabukwesi
Principal Secretary, State Department for University Education and Research,
Ministry of Education

REMARKS BY PRESIDENT INTERNATIONAL ASSOCIATION OF UNIVERSITIES



This is the start of a conference with an impressive program on an important topic. It is a great honor for me as the President to present International Association of Universities, IAU (<https://www.iau-aiu.net/>).

The pandemic Covid 19, is still ongoing and with an uncertain development. We are all facing the short term, and trying to foresee the long-term consequences of the pandemic, far beyond the health issues. Covid 19 has brought awareness of the interconnection between the SDGs and that global

perspectives on a sustainable future, reaching Agenda 2030, are crucial and necessary.

UN has clearly stated that higher education, through research and education play a key role in Agenda 2030, realizing the SDGs. International Association of Universities, IAU, has actively promoted and advocated for higher education for sustainable development, HESD, since the early 90s.

IAU was created under the auspices of UNESCO in 1950, and is a membership-based organization serving the global higher education community through: expertise & trends analysis, publications & portals, advisory services, peer-to-peer learning, events, global advocacy. It is an NGO with > 600 universities and university organizations as members all around the globe.

The Higher Education Research for Sustainable Development (HESD) is one of IAU strategic priorities and the overall objectives are to encourage peer to peer learning, monitor trends, sharing expertise, fostering whole institutions approach and providing leadership training, capacity building and networking services (<https://www.iau-aiu.net/HESD>). One important role is to engage in policy discussions, conferences and in policy documents. For example, IAU is key partner in the UNESCO Global Action Program on Education for Sustainability (GAP on HESD) and with its member institutions and organizations active in the High-Level Political Forum 2019 and 2020.

With the aim to foster further support for universities in their role in societal transformation for a global sustainable development, IAU 2018 started a university network for HESD. For each of the SDG, one university, actively working with that specific goal and interconnected goals, was invited as leader institutions and asked to build a network around that goal. Today the network comprises >80 universities around the world.

The leader institution for SDG12 is the University of Regina and Luther College and they have formed a network with six universities around the world, including the host for this meeting, Moi University, and other universities from Malaysia, Sri Lanka, Germany, Colombia and Peru. I am sure that this meeting will bring important knowledge to be shared within the IAU Cluster. Through the network there will be a global voice of the universities actions and needs to fulfill their role in reaching agenda 2030 and the SDGs. For IAU to act in promoting and advocating for HESD, global networking is crucial. Each leading institution and their satellite institutions have a role to interact with other institutions in research and education to extend the sharing and the strength of the voice of higher education to policy makers, governments, public and private funding agencies.

Covid 19 has increased the awareness of the inequalities in resources and capacities to perform research and higher education. Recent surveys including that performed by IAU (https://www.iau-aiu.net/IMG/pdf/iau_covid19_and_he_survey_report_final_may_2020.pdf) on the consequences of Covid 19 on HE pays attention to the risk of increasing inequality. This highlights the need of cohesion and cooperation between universities and between universities and the society built on global engagement and local relevance.

Knowledge creation and development through basic and applied research and innovation needs cooperation on common interests but must be built on respect and trust for each stakeholder's role, goals and legislations. For universities the fundamental principles for Higher Education needs to be respected, support academic freedom in research and education, institutional autonomy, and education built on science and/or proven experience. These are values that foster skills as critical thinking, analytical competence and creativity. Skills that together with disciplinary knowledge will be bring through students to society and empowering for taking action for a sustainable development.

IAU will continue to actively engage in promoting and advocating for the key role of universities in society for realizing the Agenda 2030. SDG12 “Ensure sustainable consumption and production patterns” safeguards and accommodates all SDGs and the outcome of this conference is of value for them all.

I wish you a successful conference.

IAU President, Dr. Pam Fredman

REMARKS BY THE VICE-CHANCELLOR, MOI UNIVERSITY



On behalf of Moi University Management, Staff, Students and, indeed, on my own behalf, I warmly welcome you all to this maiden virtual ACE II Conference jointly hosted by Moi University, Kenya, and Donghua University, The People's Republic of China. I must state that, this is the first virtual International Conference that Moi University is hosting and, therefore, will go in the annals of history of our University. It also demonstrates our capability in terms of human resource on Information Communication Technology (ICT) and gives us more impetus to improve our infrastructure in the ICT field.

The theme of the Conference is *“Advancing Science, Technology and Innovation for Industrial Growth,”* which strongly resonates with Moi University's Vision *to be a University of choice in nurturing innovation and talent in science, technology and development.* Initially, the Conference was to be held physically at Moi University, but due to the outbreak of Covid-19 pandemic, we resorted to hold it virtually. We thank the World Bank, through the government of the Republic of Kenya, which is the main funding entity of ACEII-PTRE for allowing us to hold the Conference virtually. This is actually one opportunity for us to see ourselves as a ‘global village’. During the Conference, we will have participants from Africa, Asia, Europe and Northern America, and we intend to have over seventy papers for presentations during this two-day Conference.

Brief of Moi University

Moi University was established in 1984 as the second public University in Kenya. It started with one faculty and, over the years, has expanded into fourteen Schools and four Directorates offering diverse academic programmes and involved in various research activities. We have our Main Campus located in Kesses, Uasin Gishu County, and five other Campuses, that is, three in Eldoret, and Nairobi and Mombasa. Additionally, the University has three Institutes and two subsidiary companies – Rivatex East Africa Limited and Innovation Firm Limited. The University also prides itself as a host of three Centers of Excellence in; (i) Education Research in

East and Southern Africa – CERMESA, (ii) Phytochemicals, Textile and Renewable Energy (PTRE) and (iii) African Studies.

About the ACEII-PTRE Centre

The Africa Center of Excellence in Phytochemicals, Textile and Renewable Energy (ACEII-PTRE), based at Moi University, Eldoret, Kenya, was established in the year 2016. The objective of the ACE II Project is to strengthen selected Eastern and Southern Africa higher education institutions to deliver quality postgraduate education and build collaborative research capacity in the regional priority areas. The ACEs are expected to address specific development challenges and skills gaps facing the region through graduate training in Masters', Doctorate (Ph.D.) and short-term courses and applied research in the form of partnerships and collaborations with other institutions as well as the private sector.

Impact of the ACE II-PTRE Centre

Since its inception, the Center has made a great impact on resource mobilization to the University in terms of infrastructural development such as lecture rooms and laboratories, among others. It has also contributed in capacity building by offering scholarships for staff and students, and staff exchange programmes. Such contributions have enabled Moi University to enhance its global visibility in research, innovation and teaching. I take this opportunity to thank the World Bank for its noble idea to establish Centers of Excellence across Africa, and the Republic of Kenya in particular through the Ministry of Education, and for facilitating Moi University to be a beneficiary of the same. The local community has also greatly benefitted from the ACE II Project through outreach services in short course training on self-sustainability through making detergents and soap, making of natural dyes, and training on biogas production for surrounding high schools, just to mention a few.

Coping and Containment Mechanisms of Covid-19

Moi University is well aware of the impact of the Covid-19 pandemic and swung into action to be part of the solution through inter-disciplinary research in combating the scourge. We are also involved in Covid-19 spread containment measures such as mass production of masks for public use and also medical suits through our Rivatex Textile Factory at subsidized costs. Additionally, plans are underway for the production of subsidized hand sanitizers through ACE II PTRE

Project hosted in the School of Sciences and Aerospace Studies for local consumption and commercial purposes eventually.

Conclusion

I would like to conclude by once more thanking the World Bank for their continued support as our Sponsor, Donghua University – China for jointly hosting this Conference, and the Inter-University Council of East Africa, Regional Universities Forum for Capacity Building in Agriculture, International Association of Universities, and all our other partners for their effort in being in the forefront of ensuring that Moi University achieves its vision and mandate.

I end by thanking the participants, presenters, moderators, rapporteurs, and the Organizing Committee led by the Centre Leader, for the great effort they have made to ensure the virtual Conference is a success. *'Asanteni Sana'*.

I wish all the participants the very best during this Conference.

Thank you and welcome to the Conference.

PROF. ISAAC SANGA KOSGEY, VICE-CHANCELLOR

REMARKS FROM THE PRESIDENT, DONGHUA UNIVERSITY



The Leadership of Kenyan Government

The Leadership of Moi University

Distinguished scholars from Africa, China and the rest of the world, welcome to our joint conference!

On behalf of Donghua University, I'd like to express my sincere appreciation for the joint efforts made by both sides in organizing this great academic event! This event is both a new endeavor and an old tradition at the same time!

It is new because this is the first online version of Sino-Africa International Symposium on Textiles and Apparel (SAISTA), and for the first time held alongside with another big event at Moi, namely, the Africa Center for Excellence in Phytochemicals, Textile and Renewable Energy. It is old because China and Africa have always been a community with a shared future. China is the largest developing country while Africa is the continent with the largest concentration of developing countries. Our peoples have established solid friendship between us.

Africa has a rich textile history, and Donghua University (DHU) distinguishes itself by textiles, so it is the joint textile bond that turns into solid foundation of our cooperation. As a state-key university in China, DHU was selected as a member of "Sino-Africa 20+20 University Cooperation Project" in 2010. By virtue of its advantages in Textile Engineering, Material Science, Design, etc., DHU actively builds up the platform of China-Africa textile and apparel research as well as cultural exchange: in 2015, Confucius Institute at Moi University, the first and so far only Confucius Institute featuring textile engineering and fashion design was officially launched; in the same year, the first Sino-Africa International Symposium on Textile and Apparel (SAISTA) was successfully held at DHU; in 2017, the "Belt & Road" Advanced Seminar for Textile Industry and International Cooperation in Production Capacity opened at DHU; in 2018, university-enterprise jointly established the "Belt & Road" Textile Education and Training Center (Africa) in Ethiopia. Up to 2019, SAISTA has been successfully held 5 times with 5 different themes, which attracted educators and professionals from China, Kenya, Sudan, Zimbabwe, Tanzania, Uganda, and South Africa as well as from all over the world. It's my

utmost pleasure to witness, out of our SAISTA and SACEF conferences, fruitful achievements of talent training for African textile and apparel industry as well as great advancement in China-Africa textile science and technology development.

Africa is a geographical and natural extension of the “Belt and Road” initiative as well as an essential participant. Forum on China-Africa Cooperation, a main platform for expanding and deepening bilateral cooperation, provides so many possibilities for Africa ranging from abundant resources and various pathways to huge market and space to diversified development prospects. Although this year we all face a most challenging time during the outrage of Covid-19, globalization and It can be envisioned that through this Symposium, more and more scholars and entrepreneurs will join hands and explore the connotation and effectiveness of educational collaborations between China and Africa. Together, we will make a difference in textile and apparel education, research and industry liaison between China and Africa.

Finally, I hope the joint conference this year a complete success and that everyone has an inspiring online experience!

Prof. Jianyong Yu

President, Donghua University

REMARKS BY ACEII-PTRE CENTER LEADER



On behalf of the Conference Organizing Team, this earliest opportunity to welcome our Chief Guest and all participants to the first International Conference organized virtually by the Africa Center for Excellence in Phytochemicals, Textile and Renewable Energy (ACEII - PTRE), based at Moi University, Eldoret, Kenya, and Sino-Africa Symposium on Textiles and Apparel (SAISTA), Donghua University, China.

ACEII - PTRE's aim is to advance technology development and innovation in Phytochemicals, Textile and Renewable Energy through delivery of quality post-graduate training and collaborative research in the regional priority areas. Thus, ACEII - PTRE has a special focus on capacity-building. Towards this end, the Center has equipped more than seven (7) laboratories at the School of Sciences and Aerospace Studies and the School of Engineering that support research for both staff, students in the University and partners. As such, students under the Center partial scholarship program have a great opportunity to present their research papers detailing the results realized in relation to their research during this virtual conference. The conference was supposed to be held through face to face at Moi University, Eldoret, but due to the outbreak of the Covid-19 pandemic, we resorted to hold it virtually and, on this note, we thank the University Management, the World Bank and the Ministry of Education for allowing us the latitude to hold the conference virtually.

More than one hundred papers were submitted for the conference from across the world. Papers selected for presentations reveals the amazing diversity aligned to several thematic areas that include Phytochemistry, Progressive Textiles, Renewable Energy, and Transformative Industrialization. The conference also captures Cross – cutting topics and research in Sustainable Technology and Innovations and Science, Technology, Engineering, Arts and Mathematics (STEAM) with relevance to the Theme of the Conference which is, “***Advancing Science, Technology and Innovation for Industrial Growth.***”

The conference highlights the remarkable contribution which ACEII – PTRE has made under the support of World Bank and provides a valuable opportunity for research scientists, industry specialists and decision-makers to share experiences. Further, we are grateful to the Regional

Facilitating Unit: Inter-University Council for East Africa (IUCEA) for continuous facilitation. Besides the World Bank and IUCEA, we also acknowledge the participation of our important partners and supporters; Kenya Industrial Research & Development Institute (KIRDI), RIVATEX East Africa Limited (REAL), University of Lorraine (France), University of Gezira (Sudan), Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), Busitema University (Uganda), Flexi Biogas International, Nocart, Association of Energy Professionals of East Africa (AEPEA), National University of Science and Technology (Zimbabwe), University of Gent (Belgium), University of Linköping (Sweden), Kenya Bureau of Standards (KEBS), Elsevier, Ruparelia Consultants Ltd (RCL), Kenya Association of Manufacturers (KAM), Seeding Labs (USA), and SDG 12 cluster working group.

We are grateful to the many experts who have come to share their knowledge in the conference and wish all participants fruitful deliberations in the next two days. Special thanks to the World Bank, partners and supporters, University Council, University Management and the entire Moi University fraternity for their continued support to the Center.

Last but not least we express gratitude to the Conference Organizing Team and Reviewers for their tireless effort in ensuring that all the arrangements for the conference are done well and promptly despite the challenges occasioned by Covid-19 pandemic and the same goes to presenters for carrying out research at this time of difficulties. We look forward to more successful deliberations.

Thank you.

PROF. AMBROSE KIPROP

**CENTER LEADER, AFRICA CENTER FOR EXCELLENCE IN PHYTOCHEMICALS,
TEXTILE AND RENEWABLE ENERGY (ACEII - PTRE)**

Icptre2020: OVERVIEW OF THE CONFERENCE THEME

Advancing Science, Technology and Innovation for Industrial Growth



Introduction

Science, technology and innovation (ST&I) are the seedbed for development. In addition, advancing competitiveness in ST&I is a key prerequisite to sustained industrial growth and increased standards of living. Research around ST&I must therefore continuously realign with the global dynamics and demanding needs for industrial growth

Industries around the world continue to face different afflictions elicited by several factors including social conflicts, economic, health and energy crises leading to suboptimal operations. Since the beginning of the year, the world has been thrust deep into uncharted territory and very challenging circumstances occasioned by the emergence of COVID - 19. Notwithstanding these very difficult times, the ACE II-PTRE in partnership with SAISTA provides selected participants from around the world with an opportunity to showcase their research results in the inaugural icptre2020 under the theme of *Advancing Science, Technology and Innovation for Industrial Growth*.

Advancing Science, Technology and Innovation

The world has experienced a variety of disruptive shocks over time. While the disruption to people and livelihoods in many developing countries is certainly not a new phenomenon, the developments in building rapid resilience and diverse capabilities in equally disruptive technologies are worth being celebrated. Therefore, ST&I have a critical role to play in all global afflictions.

The experience from developed partners and some of the most successful countries globally show that advancing ST&I through research and well-integrated national development strategies can help raise productivity, improve industrial competitiveness, support faster growth, create jobs and promote resilient communities. Therefore, advancing industrial growth and securing our position in the research arena is the central goal of our time. Notwithstanding the prevailing circumstances, our shared resolutions and strategic partnerships are well positioned to deliver our mutual aspirations. Today, through the ACE II-PTRE and SAISTA partnership, we are taking our next step very much aware more than ever before that any meaningful and sustainable progress in industrial growth requires humanity coming together, not as nations, but as a global community of researchers.

The conference structure

The icptre2020 is structured to offer vibrant presentations and deliberations on key ST&I research. The conference thematic areas include Phytochemistry, Progressive textiles, Renewable Energy, Transformative Industrialization, Sustainable Technology and Innovations, in addition to Science, Technology, Engineering, Arts and Mathematics presentations that contribute to the aforementioned thematic areas. The conference also brings on board the responsible consumption and production (SDG 12) cluster-working group of the International Association of Universities (IAU) Higher Education for Sustainable Development (HESD) Cluster. The IAU Cluster on HESD promotes the role that Higher Education Institutions globally have to fulfil in order to achieve the Sustainable Development Goals (SDGs) and Agenda 2030. Universities are to address the SDGs, which themselves impact on and transform universities. The Cluster encourages a holistic approach to the SDGs, focusing specifically on the whole institution approach.

In the course of the next three days, over 200 participants from around the world shall actively engage on research findings along the theme of the conference. The conference presentations will tackle diverse topics including issues pertaining to sustainable exploitation of bio-based resources, sustainable technologies, transformative nanomaterials, accelerating the transition to a renewables-based energy system among other topics. Besides, 9 keynote speakers will share their insights on key thematic topical areas. In addition, 13 selected panelists representing different regions of the globe and sectors of the economy shall engage with the audience and deliberate on a number of topical areas including contract researching, research and development, ethical issues, developing and implementing collaborative research, resilience and collaborations in pandemic times, intellectual property issues in collaborative research as well as sustainable production and consumption.

Conclusion

In summary, the conference presentations avail a unique opportunity to share knowledge, promote the actualization of several SDGs while creating new opportunities as well as contributing to the enhancement of livelihoods and global resilience to adverse disruptions. The world is currently united in the commitment to realize this opportunity.

On behalf of the entire conference organizing team, it is my humble duty to wish all the participants the most rewarding, thought provoking and vibrant deliberations.

Dr. Charles Nzila

Chairman – Conference Organizing Committee & Coordinator, Workshops, Conferences & Seminars, ACE II-PTRE

SYMPOSIUM SESSIONS

There are six (6) symposiums addressing different themes, 3 plenary sessions and 25 parallel sessions which you can attend across 3 days. Posters and exhibitions will also be displayed during the conference. The hosting will be done from 6 virtual conference rooms, each with a separate joining link.

- 1. Phytochemistry:** Nano-materials, Medicinal Chemistry, Natural Products, Phytoremediation, Food Nutrition, Phyto-economics and Phytochemical Analysis
- 2. Progressive Textiles:** Sustainable Textile Technologies and Fashion, Textile Engineering and Fibres, Technical Textiles and Composites, Functional Textiles, Development of Textile and Fashion Industry and Textiles of the future.
- 3. Renewable energy:** Smart Technologies for Energy Access, Energy Conversion, Hybrid Energy Systems; Energy Systems Modelling, Optimizations and Analysis; Energy and Environmental Management; Waste to Energy, Energy Systems Integration; Energy Storage, Energy Economics, Policy and Regulations.
- 4. Transformative industrialization:** Industrial Engineering, Manufacturing, Sustainable Production and Consumption.
- 5. Cross - cutting:** Sustainable Technology and Innovations: Supporting Science and Social Innovations, Commercialization of Technology, Environment and Innovation for Growth, Ethics and Governance, Chinese Textiles in Africa, Textile and apparel-related intangible cultural heritage and The Belt and Road Initiative (BRI).
- 6. STEAM:** Any other abstracts in Science, Technology, Engineering, Arts and Mathematics that contribute/relate to the above thematic areas.

icptre2020 CONFERENCE ORGANIZING TEAM

STEERING COMMITTEE

- | | | |
|---------------------------|---|----------------------------------------------------|
| 1. Dr. Charles Nzila | - | Chair, icptre2020 organizing Committee |
| 2. Prof. Charles Lagat | - | Chair, Logistics Committee |
| 3. Prof. Ambrose Kiprop | - | ACE II PTRE, Center Leader |
| 4. Dr. Rose Ramkat | - | ACE II PTRE, Deputy Center Leader |
| 5. Prof. Kirimi Kiriamiti | - | Chair, Resource Mobilization Committee |
| 6. Dr. Fredrick Nyamwala | - | Chair, Scientific Committee |
| 7. Chris Okech | - | Rep. SAISTA |
| 8. Naomi Nkonge | - | ACE II PTRE Administrator (In charge, Secretariat) |

SCIENTIFIC COMMITTEE MEMBERS

Dr. Fredrick Nyamwala (*Chair*)
Dr. David Njuguna (*Textile & industrial engineering*)
Dr. Jackson Cherutoi (*Phytochemicals*)
Dr. Isaac K'Owino (*Phytochemicals*)
Dr. Cleophas Achisa (*Renewable Energy*)
Dr. Jacqueline Makatiani (*Panel discussion*)
Prof. Bernard Nassiuma (*Cross cutting*)
Dr. Korir Kiptiemoi (*Secretariat*)
Dr. Lynn Kisembe (*Secretariat*)

LOGISTICS COMMITTEE MEMBERS

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Dr. Charles Nzila
Mr. Julius Cheboriot
Mr. Wilson Chumba
Mr. Moses Kipkulei
Ms. Silvia Matum
Ms. Esther Maritim
Ms. Patricia Cheramboss
Mr. Steve Mumo
Ms. Josephine Wanagwe
Mr. Edward Nyenze
Mr. Moses Chirchir
Mr. David Kuto
Ms. Jayne Njenga (*ACE II PTRE Secretary*)

RESOURCE MOBILIZATION COMMITTEE

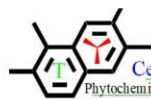
Prof. Kirimi Kiriamiti (*Chair*)
Prof. Ambrose Kiprop
Dr. Rose Ramkat
Prof. Simeon Mining
Prof. John Githaiga
Mr. Chris Okech
Dr. Milton M'Arimi
Naomi N. Nkonge (*Secretariat*)

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George Bateta
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Sammy Goin
Victor Siele
Steve Mumo
Samuel Shitote
Zipporah Boto
Julius Koech
Godfrey Rono
Gilbert Baigok
Phelister Yator

icptre2020 KEYNOTE SPEAKERS

Eight keynote speakers will be making presentations on the various thematic areas of the conference.



Center of Excellence in
Phytochemicals, Textile and Renewable Energy



THE WORLD BANK

KEY NOTE SPEAKERS



Phytochemistry
Prof. Philippe Gerardin, Professor of Natural Products Chemistry, Université de Lorraine, France



Progressive Textiles
Prof. Yiping Qiu, Professor of textile materials, composite materials, nano-materials, and functional textiles, Donghua University, China



Renewable Energy
Pavel Robert Oimeke, Director General, Energy & Petroleum Regulatory Authority



Phytochemistry
Prof. Christine Gerardin, Professor of Organic Chemistry, Université de Lorraine, France



Progressive Textiles
Prof. Lieva Van Langenhove, Professor of Functional Properties of Materials, Ghent University, Belgium



Renewable Energy
Prof. Ramchandra Bhandari, Professor of Renewable Energy Systems, University of TH Köln, Germany



Transformative Industrialization
Dr. Marcus Pereira Pessoa, Professor of Product Design and Development, University of Twente, Netherlands



Progressive Textiles
Prof. Bin Shen, Associate Professor of supply chain management, operations-marketing interface, and fashion industry, Donghua University China



Cross - Cutting
Prof. Rodgers Petry, Associate Professor of Philosophy, University of Regina, Canada



Cross - Cutting
Dr. Beatrice Muganda, Director of Higher Education, Partnership for African Social and Governance Research (PASGR), Kenya

International Conference on Phytochemistry, Textile & Renewable Energy for Sustainable Development
Conference Theme: Advancing Science, Technology and Innovation for Industrial Growth.

Venue: Virtual Conference

Host: Moi University, Eldoret, Kenya

DAY 1- WENESDAY, 12TH AUGUST 2020

Conference Plenary Opening Session LINK <https://bit.ly/3kxg1fc>

Time (Nairobi, GMT+03:00)	Speaker	Responsible
09.00-09.05	Introductions: Prof. Simeon Mining, Director Research	Moderator: Prof. Isaac Kimengi, Deputy Vice-Chancellor, Moi University Co Moderator: Prof. Yiping Qiu, Chair of SAISTA, Donghua University
09.05-09.10	Introductory remarks by: Prof. Ambrose Kiprop, ACEII PTRE Centre leader	
09.10 -09.20	Welcome Remarks by: Prof. Isaac Sanga Kosgey, Vice-Chancellor, Moi University	
09.20 -09.35	Remarks by: - Ms. Ruth Charo, Senior Education Specialist, World Bank, Kenya - Dr. Pam Fredman, President, International Association of Universities (IAU) - Prof. Jianyong Yu, President, Donghua University	Rapporteurs: 1. Dr. Milton M'Arimi 2. Dr. Fredrick Nyamwala
09.35-09.55	Address and Official Opening by: Chief Guests – PS Education	ICT Support: Mr. Moses Kirong
09.55-10.20	Overview of the Conference by: Dr. Charles Nzila Conference Chair	
10.20–10.50	Tea/Coffee Break	

Symposium Sessions

Symposium 1: Photochemistry - Nano materials, Medicinal chemistry, Natural products, Phytoremediation, Food nutrition, Phyto-economics and phytochemical analysis

Symposium 2: Renewable energy: smart technologies for energy access; energy conversion; hybrid energy systems; energy systems modeling, optimizations and analysis; energy and environmental management; waste to energy; energy systems integration; energy storage, energy economics, policy and regulations.

Symposium 3: Progressive Textiles: Sustainable textile technologies, textile engineering, technical textiles and composites and Textiles of the future.

Symposium 4: Transformative industrialization: Industrial engineering, manufacturing, sustainable production and consumption.

Symposium 5: Sustainable Technology and Innovations: Supporting Science and Social Innovations, Commercialization of Technology, Environment and Innovation for Growth, Policy, Ethics and Governance.

Symposium 6: Cross-cutting: Any other papers in Science, Technology, Engineering, Arts and Mathematics (STEAM)

DAY 1 - CONFERENCE PARALLEL SESSIONS

PARALLEL SESSIONS – 1

PARALLEL SESSIONS – 1					
Time (Nairobi, GMT+03:00)	Symposium 1 Session 1: Phytochemistry LINK: https://bit.ly/33LaQwK	Symposium 2 Session 1: Renewable energy LINK: https://bit.ly/2XNyrin	Symposium 3 Session 1: Progressive Textiles LINK: https://bit.ly/2XL7r2l	Symposium 3 Session 1: Progressive Textiles (B) LINK: https://bit.ly/33Lboc2	Symposium 4 Session 1: Transformative industrialization LINK: https://bit.ly/3kshaf
10.50 – 12.50 Nairobi 09.50 – 11.50 Paris 15.50 – 17.50 Beijing 01.50 – 03.50 Regina	Chair: Dr. Jackson Cherutoi Co-chair: Dr. Mathew Kosgei Rapporteur: Dr. Njira N. Pili IT Support: Julius Koech	Chair: Prof. Bhandari Co-chair: Prof. Samuel Rotich Rapporteur: Dr. Cleophas Achisa IT Support: Rachel Cheptumo	Chair: Prof. Yiping Qiu Co-chair: Prof. John Githaiga Rapporteur: Dr. Stephen Talai IT Support: Caroline Jepkoei	Chair: Prof. Paul Wambua Co-chair: Dr. Shengyuan Yang Rapporteur: Dr. Obadiah Maube IT Support: Godfrey Ronoh	Chair: Juma Simiyu Co-chair: Prof. Joel Kibiiy Rapporteur: Dr. I Muchilwa IT Support: Victor Siele
10.50-11.20	<i>Keynote Speaker #1 on Phytochemistry</i> Prof. Philippe Gerardin , Professor of Natural Products Chemistry, Chemistry Université de Lorraine, France	<i>Keynote Speaker on Renewable Energy</i> Prof. Ramchandra Bhandari , Professor of Renewable Energy Systems, University of TH Köln, Germany	<i>Keynote Speaker 1 on Progressive Textiles</i> Chinese Textile Industry: past, present and post COVID-19 Prof. Yiping Qiu , Professor of textile materials, composite materials, nano-materials, and functional textiles, Donghua University, China LINK: https://bit.ly/2XL7r2l		<i>Keynote Speaker on Transformative Industrialization</i> Dr. Marcus Perreira Pessoa , Assistant Professor of Product Design and Development, University of Twente, Netherlands
11.20-11.30	Health Break/Poster Session/Exhibition				
11.30-11.50	PHY-003-20 Kenyan Antivenin Plants: Ethnobotany and Future Perspectives. <i>By Timothy Omara, Abigail Jepchirchir, Alfayo Maiyo, Betty Jematia Kiptui, Decrah Moraa Nyangena, Papias Nteziyaremye, Lucy Nyambura Karanja</i>	REN-005-20 Evaluation of low cost biogas upgrading systems, <i>By Dorcas Sombei, Doricah Nyambane, Anceita Jepleting, Cleophas Achisa</i>	PROG-005-20 A Study of Coir Fibre Length Tensile Strength and Elongation as a Function of Water and Mechanical Extraction Methods, <i>By John Khafafa</i>	PROG-004-20 Influence of cotton field soil cultured bacteria on cellulosic substrate properties, <i>By Ann Wairimu Mburu, Joseph Kinyanjui Muiruri D.G. Njuguna, C. Nzila, E.N. Oyondi</i>	TRANS-001-20 Industrial Engineering and Operation Management in Ready Made Garments Industry, <i>By Ocident Bongomin, Josphat Igadwa Mwasiagi, Eric Oyondi Nganyi, Ildephonse Nibikora</i>
11.50-12.10	PHY-004-20 Isolation, Characterization and Antioxidant Activity of Phenolic Compounds from <i>Ocimum gratissimum</i> and <i>Rosmarinus officinalis</i> leaves, <i>By Winfred Nassazi</i>	REN-017-20 Production of solketal, a fuel additive, through microwave heating and catalysis, <i>By Kenneth K. Shitemi, Kirimi Kiriamiti</i>	A balance between pressure drop and filtration efficiency, how Chinese Manufacturers evolve in face mask technologies <i>By Prof. Chuyang Zhang</i>	Polyethyleneimine Modified CNT Yarn with Improved Strength and Electrical Conductivity <i>By Yanhong Cao</i>	STI-001-20 An Innovative Ergonomic Design of Classroom Furniture Based on Anthropometric Measurements at Tertiary Institutions <i>By Abdalla Elnour Ahmed Esmaeel</i>

12.10-12.30	STEAM-009-20 Substitutional Sulphur Doped 2D-MoS2: Quantum mechanical study <i>By Kibet T. Philemon, Kiprono K. Korir</i>	REN-010-20 Economic Study Results of a 100 W Residential Solar PV System <i>By Wilkins Kosgei Cheruiyot</i>	PROG-001-20 Effects of alkaline and Microwave surface modification on <i>Calotropis procera</i> bast fibers for development of Fiber-Reinforced Polylactic acid composite <i>By Enock Kiptoo Langat</i>	Effect of chemical treatments on Mechanical properties of unidirectional Ensete fiber reinforced polypropylene composite. <i>By Esubalew Dessie</i>	PROG-008-20 Optimisation of Extraction Conditions of <i>Allium burdickii</i> Natural Dye and Finger print Assessment of Bioactive Compounds using Raman Spectroscopy. <i>By K. D. Agulei, J. T. Githaiga, N.E. Oyondi</i>
12.30-12.50	PHY-009-20 Comparison of the phytochemical composition of <i>Euclea divinorum</i> Hern (Ebenaceae) leaves, tender stems and root bark <i>By Immaculate Mbabazi, Dr. Phanice Tsikhungu Wangila, Dr. Isaac Kowino, Prof. Ambrose Kiprop.</i>	REN-002-20 Optimization of Liquid Fuel from Microwaves Pyrolysis of Used Tyres, <i>By Ronald K. Bett</i>	Silk Fibroin based Conductive Fiber and its Applications <i>By Dr. Liyun Ma</i>	Development and Characterization of Helical Auxetic Yarn toward Wearable Textiles and Joule Heating Application <i>By Junli Chen</i>	POSTER SESSION
12.50-13.10	PHY-019-20 Phytochemical Screening, total phenolic content and total flavanoid content of acetonic extracts of the heartwood of <i>Prosopis juliflora</i> , <i>By Mark Peter Odera</i>	POSTER SESSION	Programing Performance of Silk Fibroin Superstrong Scaffolds by Mesoscopic Regulation among Hierarchical Structures <i>By Dr. Yifan Zhang</i>	Circular Economy, Sustainability and Recycling of Textiles <i>By Mike Tebyetekerwa</i>	POSTER SESSION
13.10-13.30	POSTER SESSION	POSTER SESSION	High-performance, multifunctional 3D woven composites <i>By Prof. Fujun Xu</i>	The current state and future development trend of apparel industry under COVID-19 <i>By Pingping Xu</i>	POSTER SESSION
13.30-14.00	Lunch Break/Poster Session/Exhibition LINK: https://bit.ly/3kxglfc				
PARALLEL SESSIONS – II					
Time (Nairobi, GMT+03:00)	Symposium 1 Session 2: Phytochemistry LINK: https://bit.ly/33LaQwK	Symposium 1 Session 2: Phytochemistry (B) LINK: https://bit.ly/2XNvFm	Symposium 2 Session 2: Renewable energy LINK: https://bit.ly/2XL7r21	Symposium 3 Session 2: Progressive Textile LINK: https://bit.ly/33Lbwo2	Symposium 4 Session 2: Transformative industrialization LINK: https://bit.ly/3kshaf
14.00 – 15.20 Nairobi 13.00 – 14.20 Paris 19.00 – 20.20 Beijing 05.00 –06.20 Regina	Chair: Dr. Jackson Cherutoi Co-chair: Dr. Fredrick Kengara Rapporteur: Dr. Njira Pili IT Support: Julius Koech	Chair: Prof. Samuel Rotich Co-chair: Mr. Pnenwix Musonye - EPRA/AEPEA Rapporteur: Dr. Cleophas Achisa IT Support: Rachel Cheptumo	Chair: Prof. John Githaiga Co-chair: Prof. Fujun Xu Rapporteur: Dr. Stephen Talai IT Support: Caroline Jepkoge	Chair: Prof. Xiaohong Qin Co-chair: Prof. Paul Wambua Rapporteur: Dr. Obadiah Maube IT Support: Godfrey Ronoh	Chair: Juma Simiyu Co-chair: Prof. Joel Kibiiy Rapporteur: Dr. I Muchilwa IT Support: Victor Siele

14.00-14.20	PHY-019-20 Antacid effect of Leaf Extracts of <i>Bidens pilosa</i> Linn Varr Radiata. By Merab Llian Ndiege.	REN-025-20 Role of Modified Coulomb Potential in Determining Stability of Isobars By Hezekiah Komen Cherop	STI-002-20 A Content Based Image Retrieval Model Using Color, Texture And Shape Features With K-Nearest Neighbor Algorithm For E-Commerce, By Gibson Kimutai, Wilson Cheruiyot, Calvins Otieno, Ambrose Kiprop	REN-001-20 Production of Biogas from Sized Cotton Yarn Wastes By Twizerimana Maurice	PROG-006-20 Thermal properties of sisal/cattail fibre reinforced polyester hybrid composites, By Silas M. Mbeche
14.20-14.40	PHY-008-20 Identification of phenolic compounds in <i>Prosopis juliflora</i> by liquid chromatography electrospray ionization tandem mass spectrometer, By Sarah Cheron Chepkwony, Ambrose Kiprop, Stéphane Dumarçay, Hubert Chapuis, Philippe Gerardin, Christine Charbonnier Gerardin	REN-016-20 Microgrids As The Vehicle To Rural Development: The Case Of Uganda, By Gad Reuben Mugagga, Hope Baxter Chamdimba	CROSS-004-20 Studies on Medicinal Potentials of <i>Hannoa undulata</i> Essential Oil, By Anayo Joseph Uraku	PROG-002-20 Identification of means of alleviating production related to problems that lead to poor garment manufacture, By Mqondisi Moyo	TRANS-003-20 Impact of Organizational Safety Climate on Productivity By Veronika Gerald Kimario
14.40-15.00	PHY-018-20 Phytochemical Screening, Total Phenolic and Total Flavonoid Contents of <i>Senna didymobotrya</i> By Bernard Otieno Sadia	REN-023-20 Evaluation of sugarcane vinasse and maize stalks waste for anaerobic digestion By Mohamed Kibet Kiplagat, Cleophas Achisa Mecha	REN-006-20 Photovoltaic off grid solar home system sizing using the charging current and total energy methods: A comparison of the two sizing methods, By Dr. Sebastian Waita	POSTER SESSION	POSTER SESSION
15.00-15.20	PHY-018-20 Application of Response Surface Methodology for optimized adsorption of crystal violet dye from aqueous solution using <i>Eichhornia crassipes</i> biochar, By Frankline Bwana, Florence Atieno Opondo, Mathew Kosgei	POSTER SESSION	POSTER SESSION	POSTER SESSION	POSTER SESSION
15.20	HEALTH BREAK/ TEA/ COFFEE/POSTER SESSION /EXHIBITION LINK: https://bit.ly/3kxg1fc				
	END OF DAY 1				

DAY 2 – THURSDAY 13TH AUGUST, 2020

PARALLEL SESSIONS – III

Time (Nairobi GMT+03:00)	Symposium 1 Session 3: Phytochemistry LINK: https://bit.ly/3kv7B8g	Symposium 1 Session 3: Phytochemistry (B) LINK: https://bit.ly/3aayTMe	Symposium 2 Session 3: Renewable energy LINK: https://bit.ly/3arbb7M	Symposium 3 Session 3: Progressive Textile LINK: https://bit.ly/3afPGxx	Symposium 4 Session 3: Transformative industrialization LINK: https://bit.ly/30EGHCL
09.00 – 11.20 Nairobi 8.00 – 10.20 Paris 14.00 – 16.20 Beijing 00.00 – 2.20 Regina	Chair: Dr. David Njuguna Co-chair: Dr. Martha Induli - KIRDI Rapporteur: Dr. Sarah Chepkwony IT Support: Julius Koech	Chair: Dr. J. Makatiani Co-chair: Dr. Sebastian Waita Rapporteur: Dr. Titus Rotich IT Support: Rachel Cheptumo	Chair: Prof. Zachary Siagi Co-chair: Geoffrey Ssebabi Rapporteur: Dr. Jerry Ochola IT Support: Caroline Jepkoge	Chair: Prof. Kun Zhang Co-chair: Dr. Eric Oyondi Rapporteur: Dr. Dorcas Lusweti IT Support: Godfrey Ronoh	Chair: Eng. Prof. Simiyu Sitati Co-chair: Brenda Akankunda Rapporteur: Dr. Milton M'Arimi IT Support: Victor Siele
09.00-09.30	Keynote Speaker #2 on Phytochemistry Prof. Christine Gerardin , Professor of Organic Chemistry Université de Lorraine, France LINK: https://bit.ly/3kv7B8g		Keynote Speaker #2 on Renewable Energy Pavel Robert Oimeke, EBS Director General – EPRA LINK: https://bit.ly/3irbB7M	Keynote Speaker 2 on Progressive Textiles Prof. Lieva Van Langehove , Professor of Functional Properties of Materials, Ghent University, Belgium LINK: https://bit.ly/3afPGxx	
9.30 – 9.40	Health Break/Poster Session/Exhibition LINK:				
09.40-10.00	PHY-007-20 Biosynthesis of Zinc Oxide Nanoparticles Precursor for Development of Nanocomposite for Degrading Selected Organochlorines, <i>By Calvin Ochieng Ondijo</i>	PHY-006-20 Effect of temperature and cooking time on total phenolic content, total flavonoid content and antioxidant activity of garlic <i>By Thandiwe Alide</i>	REN-009-20 Evaluation of Kisumu County Clay Soil for Plastic Waste Pyrolysis <i>By Mibei Chirchir Zeddy</i>	Effects of weave structures on water wicking-evaporating behavior of woven fabrics <i>By Prof. Yanxue Ma</i>	TRANS-007-20 Industrial Output in Uganda: Does Electricity access Matter? <i>By Brendah Akankunda, Muiywa S Adaramola and Arild Angelsen</i>
10.00-10.20	PHY-002-20 Chemical composition and insecticidal activity of <i>Pinus caribaea</i> Morelet var. hondurensis needles against <i>Sitophilus zeamais</i> Motschulsky and <i>Callosobruchus maculatus</i> Fabricius. <i>By John Mary Kirima, Timothy Omara</i>	PHY-011-20 Dyeing Characteristics of Different Solvent Extracts of <i>Euclea divinorum</i> on Cotton Fabric <i>Scolastica, Ambrose K. Kiprop, Josphat Mwasiagi Igadwa, Achisa Cleophas</i>	REN-018-20 A Time Series Analysis of Modern Socio Economic Determinants for Carbon Emission Levels in Emerging Sub-Saharan Economies <i>By Kusasira Samuel</i>	Carbon nanotube film/PDMS composite Toward multifunctional actuator <i>By Dr. Mohamed Amine Aouraghe</i>	Prospects of Textile Industry in Sudan: A Technical Vision <i>By Dr. Haroon A.M. Saeed</i>

10.20-10.40	STEAM-001-20 Theoretical Modeling of Selected Toxic Molecular Products from The Thermal Degradation of A Selected Light Cigarette Brand <i>By Maiyo Alfayo</i>	PHY-017-20 Colourimetric Study of Natural Dye from Beta vulgaris Peels and Pomace on Cellulosic Substrate <i>By Rotich Vincent, Wangila Phanice, Cherutoi Jackson</i>	REN-004-20 Redox Potential advances of Quinone derivatives for energy storage applications. <i>By Cosmas K. Kosgei, Henry Kiriamiti</i>	Design and Manufacturing of thermoelectric textiles for harvesting thermal energy and powering electronics <i>By Prof. Kun Zhang</i>	TRANS-006-20 The use of solar evacuated tube as an alternative method of drying, <i>By Joan Jepkosgei, Isaiah Muchilwa, Jerry Ochola, George Omollo Owino, David Tuigong</i>
10.40-11.00	PHY-001-20 Geochemical Fractionation of Heavy Metals in Chromated Copper Arsenate Contaminated Soil, <i>By Caroline Kiwanuka Nakiguli</i>	PROG-007-20 Dyeing of cotton fabric with natural dye from <i>flavoparmelia caperata</i> <i>By Linet Jelagat Kipkulei</i>	REN-021-20 Electricity Consumption and Economic growth in Uganda. <i>By Geoffrey Ssebabu Mutumba</i>	Fabrication and acoustic performance of natural cellulose fabric reinforced epoxy composites for musical instruments <i>By Fanxizi Liu</i>	Carbon-based coating fabrics with high conductivity for excellent electromagnetic shielding performance <i>By Dr. Chuntao Lan</i>
11.00-11.20	PHY-013-20 Evaluation of shading on tea (<i>Camellia sinensis</i> (L.) O. Kuntze) yield component and phenolics in aerated and unaerated products, <i>By Robert K. Korir, Kamunya, S.M, Ramkat, R.C and Muoki, R.C</i>	High Performance Bio-Based Epoxy Vitrimers with Closed-Loop Recyclability and Its Application in Carbon Fiber Reinforced Composites <i>By Hafeezullah Memon</i>	POSTER SESSION	Design and development for Polymeric Optical Fiber (POF) Textiles via Jacquard technology <i>By Dr. Lan Ge</i>	POSTER SESSION
11:20 - 11.30	Health Break/Poster Session/Exhibition				

PARALLEL SESSIONS – 1V

Time (Nairobi, GMT+03:00)	Symposium 1 Session 4: Phytochemistry	Symposium 2 Session 4: Renewable energy (A)	Symposium 2 Session 4: Renewable energy (B)	Symposium 4 Session 4: Transformative industrialization	Symposium 6 Session 1: Cross cutting
11.30 – 17.00 Nairobi 10.30 – 16.00 Paris 16.30 – 22.00 Beijing 02.30 – 08.00 Regina	Chair: Dr. David Njuguna Co-chair: Dr. Martha Induli - KIRDI Rapporteur: Dr. Sarah Chepkwony IT Support: Julius Koech	Chair: Prof. Bhandari Co-Chair: Dr. Korir Kiptiemoi Rapporteur: Dr. Patrick Nziu IT Support: Rachel Cheptumo	Chair: Prof. Zachary Siagi Co-chair: Miftah Fekadu Kedir Rapporteur: Dr. Titus Rotich IT Support: Caroline Jepkoge	Chair: Eng. Prof. Simiyu Sitati Co-chair: Brenda Akankunda Rapporteur: Dr. Njira Njira IT Support: Godfrey Ronoh	Chair: Prof. Kirimi Kiriamiti Co-chair: Dr. Roger Petty Rapporteur: Dr. J. Ochola IT Support: Victor Siele
11.30-11.50	STEAM-005-20 Determination of precursors of acrylamide formation in roasted maize <i>By Margaret C. Koske, Kiprop A, Ongoma P.O, Kagwanja S.M, Gichumbi J.M, Kariuki S.M.</i>	REN-019-20 A Review of Solar Adsorption Cooling with focus on Modeling and Performance Study of a Solar Adsorption Cooler using Composite Adsorbent, Steatite impregnated with Activated Charcoal, Paired with Methanol as the Adsorbate. <i>By Eric Minda Nyanga'u</i>	REN-024-20 The Effects of Gross Domestic Product and Energy Consumption on Carbon Dioxide Emission in Uganda (1986-2018) <i>By OTIM, Jacob</i>	TRANS-008-20 Numerical Modelling and Simulation of Femur Bone Reinforcement using Braided Structures, <i>By Dr. Jerry Ochola and Michael Conti</i>	Building Back Better: The Sustainable Development Fashion Agenda <i>By Michael Stanley-Jones</i>

11.50-12.10	PHY-016-20 Optimization of water-based drilling mud using leaves from <i>Veronia amygdalina</i> . By Tecla C. Biwott, Ambrose K. Kiprop, Onyewuchi Akaranta, Oriji Boniface	POSTER SESSION	REN-012-20 Experimental Investigation of Thermal Efficiency Enhancement of Improved Biomass Cookstoves for Domestic Cooking Applications By Waganesh Adamase Wagaye and Meseret Biazen Belete	TRANS-004-20 Antibacterial efficacy of the aqueous and ethanolic herbal extracts from <i>Datura stramonium</i> , <i>Racinus communis</i> and <i>Galinsoga parviflora</i> plant leaves. By Musinguzi Alex, Josphat Igadwa Mwasiagi, Nzila Charles, Nibikora Ildephonse	Sustainability in Fashion, is it viable in our consumption-orientated society? By Xin Zhang
12:10-12.30	PHY-005-20 Evaluation of Antioxidant and Antibacterial Activities Cytotoxicity of Acacia By Abdirahman Elmi	POSTER SESSION	POSTER SESSION	STEAM-004-20 Bayesian for Simple and Generalized Linear Models: Comparing INLA and McMC Techniques, By John Darkwah	Morphology reconstruction of electrospinning nanofibers and its application in electrochemical energy storage By Prof. Xin Xia
12.30-12.50	PHY-015-20 Bioefficacy of <i>Chrysanthemum cinerariifolium</i> and <i>Allium sativum</i> oil extracts against <i>Sitophilus zeamias</i> . By Samson Lutta, Luswet Kitui, Stephen Barasa1, and Munene Macharia	POSTER SESSION	POSTER SESSION	TRANS-002-20 Design, fabrication and testing of a hand driven canola/sunflower seed cold press machine, By Juma Simiyu	Miniaturization of the textile wearable antenna and its electromagnetic radiation properties By Prof. Lan Yao
12.50-13.10	CROSS-003-20 Assessment of Ni toxicity to fungi and bacteria in oil tainted soils in Greater Port Harcourt Area, Nigeria. By Wanjala, M.P, Odokuma, L, Etela I, Ramkat, R, Blessing A.O., Karanteng-Ado E.J	POSTER SESSION	POSTER SESSION	POSTER SESSION	Peptides Preloaded Injectable and Self-Healing Hydrogel for Antibacterial Wound Dressing Application By Tingting Ye
13.10-14.00	Lunch Break/Poster Session/Exhibition				
	JOINT PLENARY SESSION				
14.00-16.00	PARTNERS INTERACTION SESSION - Theme: Embracing Collaborative Research Panelists and topics. 1. Prof. Samson Rwahwire - Director Graduate Studies, Busitema University - Contract Researching 2. Dr. Simon Githuku - In-charge of Research, KAM - Research & Development (R&D) 3. Vesa Korhonen - CEO, Nocart - Ethical issues in collaborative research 4. Dominic Wanjihia - CEO, Biogas International - Implementing collaborative research 5. Prof. David Tuigong - CEO, KIRDI - Developing collaborative research 6. Dr. A. Mweetwa & Dr. Runyararo - RUFORUM - Resilience and collaborations in pandemic times 7. Prof. Simeon Mining, Director Research, Moi University - Intellectual Property issue in collaborative research			Moderator: Eng. Harness Mukhongo - AEPEA Co-Moderator: Dr. Keneth Chelule - KIRDI Researcher Rapporteurs: Dr. Jacqueline Makatiani- Moi University Josephat Chege - Biogas Internnnational ICT Technician: Moses Kirong	

16.00-17.00	KEYNOTE SPEAKERS INTERACTION SESSION Theme: Sustainable Consumption and Production (SCP) and COVID-19 Responsible Consumption and Production (SDG 12) Team Member Panel of the International Association of Universities (IAU) <i>Higher Education and Research for Sustainable Development (HESD) Cluster for the UN SDGs</i> Panelist <ol style="list-style-type: none"> 1. Dr. Roger Petry. Professor of Philosophy, Co-coordinator, RCE Saskatchewan & Cluster Co-Chair, SDG 12, Luther College at the University of Regina (Canada) 2. Detlev Lindau-Bank. Researcher for Education & Social Work & Chair of RCE Oldeburger Munsterland, University of Vechta (Germany) 3. Prof. Dr. Margit Stein. Prof. of Education, University of Vechta (Germany) 4. Prof. Kenneth Ochoa, Director of Environmental Engineering, Faculty of Engineering El Bosque University (Colombia) 5. Dr. Rose Ramkat, Head of Department, Biological Science & Deputy Center Leader ACE II – PTRE, Moi University (Kenya) 	Moderator: Dr. Zinaida Fadeeva, Visiting Professor, Nalanda University (India) Universiti Sains Malaysia – USM, Malaysia Co-Moderator: Dr. Jacqueline Makatiani Rapporteur: Dr. Dorcas Lusweti ICT Technician: Moses Kirong
17.00- 17.10	HEALTH BREAK/ TEA/ COFFEE/ POSTER SESSION /EXHIBITION	
	END OF DAY TWO	

Time	PARALLEL SESSIONS – V			
(Nairobi, GMT+03:00)	Symposium 2 Session 5: Renewable energy	Symposium 5 Session 1: Sustainable Technology and Innovations and STEAM	Symposium 6 Session 2: Cross cutting (A)	Symposium 6 Session 3: Cross cutting (B)
09.00 – 12.30 Nairobi 8.00 – 11.30 Paris 14.00 – 17.30 Beijing 00.00 – 03.30 Regina	Chair: Prof. Eng. Augustine Makokha Co-chair: Dr. Korir Kiptiemoi Rapporteur: Dr. Stephen Talai IT Support: Julius Koech	Chair: Dr. Kefa Chepkwony Co-chair: Dr. Isaac Kowino Rapporteur: Dr. Jerry Ochola IT Support: Rachel Cheptumo	Chair: Prof. Kirimi Kiriamiti Co-chair: Prof. Simeon Mining Rapporteur: Dr. Titus Rotich IT Support: Caroline Jepkoge	Chair: Prof. Julius Kipkemboi Co-chair: Prof. Bin Shen Rapporteur: Dr. Dorcas Lusweti IT Support: Victor Siele
09.00-10.00	<p><i>Keynote Speaker #1 on Cross cutting</i> Dr. Roger Petry, Professor of Philosophy, Co-coordinator, RCE Saskatchewan & Cluster Co-Chair, SDG 12 , Luther College at the University of Regina, Canada.</p> <p><i>Keynote Speaker #2 on Cross cutting</i> Dr. Beatrice Muganda - Director of Higher Education, Partnership for African Social and Governance Research (PASGR), Kenya</p> <p><i>Keynote Speaker #3 on Progressive Textiles</i> Prof. Bin Shen, Associate Professor of supply chain management, operations-marketing interface, and fashion industry, Donghua University China</p>			
10.00 – 10.10	Health Break/Poster Session/Exhibition			
10.10 – 10.30	REN-022-20 Purification and upgrade of biogas using biomass derived adsorbents: Review <i>By Elshaday Mulu, M'Arimi, M.M, Ramkat, R.C</i>	STEAM-002-20 Africa's need for a Technological Approach to Monitor Pollution from Mining activities <i>By Anita Antwiwaa, Joseph Quansah, Richard Damoah</i>	CROSS-006-20 A Survey of the Impact of COVID-19 on Businesses in Uasin Gishu County in Kenya, <i>By Charles Lagat, Benard Nassiuma, Kefa Chepkwony & Stephen Bitock.</i>	CROSS-008-20 Mapping capabilities in RE firms and projects– Insights from an integrated Survey. <i>By Dr. C. Nzila and Prof. M. Korir</i>
10.30-10.50	REN-003-20 Renewable Energy Policy Implementation Drivers and Barriers in Uganda. <i>By Bosco Amerit</i>	STEAM-007-20 Computational Modelling of Cannabinoid Derivatives from the Thermal Degradation of <i>Cannabis sativa</i> <i>By Micah Omari Omare, Joshua Kiprotich Kibet, Jackson Cherutoi, Fredrick Orori Kengara</i>	CROSS-001-20 A Survey of Engineers' and Engineering Students' Ethical Awareness and Conduct <i>By Emmanuel C. Kipkorir</i>	Protection and Development-Intangible Cultural Heritage Project in Donghua <i>By Bin Chen</i>
10.50-11.10	POSTER SESSION	STEAM-003-20 Mitigation of power outages in Rwanda <i>By Boniface Ntambara</i>	CROSS-009-20 Responsible Consumption and Production for Wholistic Transformation of Universities: Innovating in Scholarly Governance, Methods, and Identities for Broad-scale Sustainability Impact in Industry and Society <i>By Dr. Roger Petry, Ms. Jocelyn Crivea</i>	CROSS-002-20 Smart Refuse Collection Bin <i>By Dr. Phillip Kisembe</i>
11.10- 11.30	POSTER SESSION	POSTER SESSION	CROSS-005-20 Research ethics and scientific innovations nexus: Unpacking the essentials <i>By Prof. Julius Kipkemboi, Prof. Naanyu</i>	POSTER SESSION
11.30 - 11.50	HEALTH BREAK/ TEA/ COFFEE/ POSTER SESSION /EXHIBITION			

CLOSING SESSION

CLOSING SESSION		
Time	Event	Responsibility
11.50- 12.00	ENTERTAINMENT: MU Anthem / National Anthem	Moderator: Prof. Nathan Ogechi, Deputy Vice-Chancellor, Student Affairs, Moi University Co-Moderator: Dr. Mingwei Zhao, Director, International Cooperation Office, Donghua University Rapporteurs: Dr. Milton M'Arimi ICT Technician: Moses Kirong
12.00–12.15	Chief Guest Address: Representative from Chinese Embassy in Kenya	
12.15- 12.20	Vote of Thanks : Conference Logistics Chairperson, Prof. C. Lagat	
12.20- 12.30	Announcements: Conference Scientific Chairperson, Dr. F. Nyamwala	
12.30	POSTER SESSION /EXHIBITION	
	END OF CONFERENCE	

International Conference on Phytochemistry, Textile & Renewable Energy for Sustainable Development
Conference Theme: Advancing Science, Technology and Innovation for Industrial Growth.
VENUE: VIRTUAL CONFERENCE
Host: Moi University, Eldoret, Kenya

CONFERENCE JOINING LINKS

PLENARY SESSIONS

Day 1	12.08.2020	Opening session	https://bit.ly/3kxg1fc
	09.00 – 17.00	Poster & Exhibition	https://bit.ly/3kxg1fc
Day 2	13.08.2020	Interactive session	https://bit.ly/2DWCGRe
	09.00 – 17.00	Poster & Exhibition	https://bit.ly/2DWCGRe
Day 3	14.08.2020	Closing session	https://bit.ly/3af2uUV
	09.00 – 17.00	Poster & Exhibition	https://bit.ly/3af2uUV

PARALLEL SESSIONS

DAY 1 - CONFERENCE PARALLEL SESSIONS

10.50 – 12.50 Nairobi	Symposium 1	Symposium 2	Symposium 3	Symposium 3	Symposium 4
09.50 – 11.50 Paris	Session 1:	Session 1: Renewable	Session 1: Progressive	Session 1: Progressive	Session 1:
15.50 – 17.50 Beijing	Phytochemistry	Energy	Textiles	Textiles (B)	Transformative
01.50 – 03.50 Regina					Industrialization
14.00 – 15.20 Nairobi	Symposium 1	Symposium 1	Symposium 2	Symposium 3	Symposium 4
13.00 – 14.20 Paris	Session 2:	Session 2:	Session 2: Renewable	Session 2: Progressive	Session 2:
19.00 – 20.20 Beijing	Phytochemistry	Phytochemistry (B)	Energy	Textile	Transformative
05.00 – 06.20 Regina					Industrialization
Links	https://bit.ly/33LsQwK	https://bit.ly/2XNvFtn	https://bit.ly/2XL7r2I	https://bit.ly/33Lbno2	https://bit.ly/3ktshxf

DAY 2 - CONFERENCE PARALLEL SESSIONS

09.00 – 11.20 Nairobi 08.00 – 10.20 Paris 14.00 – 16.20 Beijing 00.00 – 02.20 Regina	Symposium 1 Session 3: Phytochemistry	Symposium 1 Session 3: Phytochemistry (B)	Symposium 2 Session 3: Renewable Energy	Symposium 3 Session 3: Progressive Textile	Symposium 4 Session 3: Transformative Industrialization
11.30 – 17.00 Nairobi 10.30 – 16.00 Paris 16.30 – 22.00 Beijing 02.30 – 08.00 Regina	Symposium 1 Session 4: Phytochemistry	Symposium 2 Session 4: Renewable Energy (A)	Symposium 2 Session 4: Renewable Energy (B)	Symposium 4 Session 4: Transformative Industrialization	Symposium 6 Session 1: Cross cutting
Links	https://bit.ly/3kv7B8g	https://bit.ly/3aayTMO	https://bit.ly/3irbB7M	https://bit.ly/3afPGxx	https://bit.ly/30FGHCL

DAY 3 - CONFERENCE PARALLEL SESSIONS

09.00 – 12.30 Nairobi 08.00 – 11.30 Paris 14.00 – 17.30 Beijing 00.00 – 03.30 Regina		Symposium 2 Session 5: Renewable Energy	Symposium 5 Session 1: Sustainable Technology and Innovations and STEAM	Symposium 6 Session 2: Cross cutting (A)	Symposium 6 Session 3: Cross cutting (B)
		https://bit.ly/3kERRzI	https://bit.ly/30IzPVI	https://bit.ly/3gJ7p35	https://bit.ly/3fGOUuv

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icptre2020 KEYNOTE SPEAKERS BIODATA

Prof. Philippe GERARDIN



Philippe GERARDIN is Professor at Lorraine University, where he teaches organic chemistry and wood sciences. In charge of LERMAB laboratory since 2011, his research activities concern wood chemistry and wood protection in order to improve and promote wood and wood derived products utilizations. In this context, he is particularly interested in wood extractives chemistry in relation with its natural durability.

Prof. Christine GERARDIN



Christine GERARDIN is professor of organic chemistry at the University of Lorraine. Her research in the laboratory for studies and research on wood materials (LERMAB) focuses on the chemical valorisation of wood molecules and she is in charge of the "synthesis and formulation" theme at LERMAB. She has been director of the doctoral school "Science and Engineering of Molecules, Products, Processes and Energy" since 2017. The themes developed are the organic synthesis of amphiphilic compounds with functional properties (surfactant, gelling agent, antifungal, antioxidant, etc.) from bio-sourced compounds; It is particularly interested in the chemical modification of extractable materials from wood and plant biomass, in the characterization of surface activity and assemblies of amphiphilic compounds; but also in wood chemistry and the development of green formulations for wood preservation.

Prof. Yiping Qui



Prof. Yiping Qiu received his B.S. degree in Textile Engineering at Zhejiang Science and Technology University in 1982, M.S. degree in Textile Science at Auburn University in 1988, and Ph.D. degree in Fiber Science at Cornell University in 1992. He then did his post-doctoral training at Massachusetts Institute of Technology with Prof. Stanley Backer from 1992 – 1994. Afterwards, he worked as the Principal Materials Scientist in the Timberland Company, and an Assistant Professor at Kansas State University and North Carolina State University. In 2003 he joined College of Textiles at Donghua University as a Professor, specializing in textile materials, composite materials, nano-materials, and functional textiles.

He is the Executive Vice Chairman of Mainland China Region of the Society for Advancement of Material Processing and Engineering (SAMPE) and served as the Chairman of the Textile Engineering Division, American Society for Mechanical Engineers. In 2014, he was awarded SAMPE Fellow. He was a technical consultant for five American Companies, including P&G, PPG, and Corning Inc. and a technical expert witness for three US law firms. He finished research projects from NSF, NIH, and NTC of USA. After back to China, Prof. Qiu has received funding from National High Technology Research and Development Program of China, National Defense Basic Science Research Program, and Shanghai Pujiang Program as well as projects from number of domestic and international companies. He is serving as an editorial board member for Textile Research Journal, Journal of Industrial Textiles, Journal of Adhesion Science and Technology, and Review of Adhesion and Adhesives. He has published more than 200 referred journal papers in peer-reviewed international journals and received one US patent and more than 100 Chinese patents. He has graduated more than 25 PhD students, and more than 70 MS students both in China and in the US.

Prof. Lieva Van Langenhove



Training: Prof. Lieva Van Langenhove is a senior full professor at Ghent University, Belgium. She has a doctorate degree in Applied Science specializing in textile research. She was honoured with Doctor Honoris Causa for her outstanding contributions to textile research and development by Aurel Vlaicu University Arad, Romania. She has undertaken various professional training including project management, thesis supervision, performance appraisal, complexity management, and programme management among others.

Teaching Experience: Professor Lieva has a vast teaching experience at Ghent University where she teaches several programmes, including, Master of Material Science (Textiles), European Textile Engineering and Advanced Master E-TEAM. Her teaching specialty includes textile production technology, smart textiles, and process/ product control in textiles. In addition, she has given several guest lectures worldwide and coordinates an international course on “intelligent textiles”. She is the UGent coordinator of KNOWLEDGE4ALL which is a co-creation for multidisciplinary teaching. She is an external examiner in several universities in Europe.

Project Management: Professor Lieva has acquired around 60 projects from different funders amounting to € 15M UGent funding with approximately 25 projects focusing on smart textiles. She is a coordinator of approximately 30 national and 10 EU projects. She has evaluated several research projects related to textile in Flanders, EU programmes and Marie Curie (fellowships, research training networks)

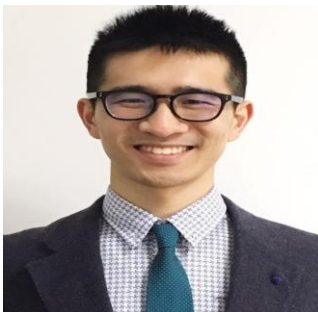
Research Output and Publications

- She has co-authored and edited several books
- She has written 14 book chapters
- She has 71 a1 papers, 21 a2 papers, 33 other papers, 154 papers in proceedings of scientific conferences, 39 conference abstracts.
- She is a reviewer of 10 scientific journals and an editorial board member of two journals.
- She has organized two seminars, 13 international workshops, sessions at international conferences and co-organized ITMC (bi-annual conference on intelligent textiles and mass customization)
- She is a promoter of more than 50 theses, (co) supervisor of 20 doctoral degrees, 15 ongoing.
- Member of the Board of Examiners of approximately 20 PhD at Ghent University and other universities abroad.
- She was selected as one of the 50 Belgian tech pioneers by “de Tijd” in 2017

Other Achievements and Commitments

- Professor Lieva co-founded UGent design factory in 2016
- She is a member of numerous UGent committees within and outside the Faculty Engineering and Architecture.
- Professor Lieva has extensive boardroom experience latest been the vice president of Hercules foundation

Prof. Bin Shen



Prof. Bin Shen is an Associate Professor in Glorious Sun School of Business and Management in Donghua University, Shanghai. He is Humboldt Fellow in Germany. He has published more than 50 research articles in leading journals, such as Production and Operations Management, Journal of Business Research, Supply Chain Management: An International Journal, Technological Forecasting and Social Change, International Journal of Production Economics, etc. He won The Textile Institute Research Publication Award from The Textile Institute in 2016. He is editorial board member of Transportation Research Part E: Logistics and Transportation Review and guest editors for Asia-Pacific Journal of Operational Research, Annals of Operations Research, Journal of Fashion Marketing and Management. His research interests focus on supply chain management, operations-marketing interface, and fashion industry.

Dr. Marcus Vinicius Pereira Pessoa



Dr. Marcus Vinicius Pereira Pessoa is an Assistant Professor of Product Design and Development at University of Twente, the Netherlands. His main research focuses on improving the Product Design and Development process by considering the interconnections between the disciplines of Industrial Systems Engineering and Project Management. He is a retired military pilot from the Brazilian Air Force Academy and he has a master degree in applied computing and a doctor degree in mechanical aeronautical engineering. He is also a post doctorate fellow at MIT, USA mechanical and systems engineering departments (2007–2008). In the Brazilian Air Force he worked on several air defense and air traffic management systems development projects.

Prof. Dr. Ramchandra Bhandari



Prof. Dr. Ramchandra Bhandari is working as a professor for “Renewable Energy Systems” and at the ITT of TH Köln (University of Applied Sciences) since March 2013. He is founding member of the Cologne Institute for Renewable Energy at the TH Köln and is serving also there as a vice director since it was founded in 2014. Prof. Bhandari obtained his Bachelor’s degree in “Mechanical Engineering” from Tribhuvan University, Nepal. He further received his Master’s degree in renewable energy management from Germany. He wrote his dissertation at the University of Kassel (in Germany) in the field of renewable energy. Before he took the current position as a Professor, he was working at the Centre for Renewable Energy of the University of

Freiburg and Institute for Energy and Climate Research of the Research Centre Jülich. He holds already more than a decade long experience in renewable energy sector. He has published several articles in peer-reviewed journals. He is also a reviewer in a few renowned journals and Associate Editor of the Springer's journal “Euro-Mediterranean Journal for Environmental Integration”. He is principle investigator in different research projects in the field of renewable energy at TH Köln (funded by the German Federal Ministry for Education and Research, Federal Ministry of Economic Cooperation and Development, etc.) in partner countries in Africa (Algeria, Niger, Mali, Ethiopia, etc.) as well as Asia (Jordan, Pakistan, etc.). He is a member in different research groups, conferences organizing committees, etc.

Pavel Robert Oimeke, Director General, Energy & Petroleum Regulatory Authority (EPRA), Kenya



Pavel Robert Oimeke is an energy and energy efficiency Specialist with over 20 years of experience. He is also an expert in policy and regulatory in the energy and petroleum sectors. Pavel holds a Bachelor’s degree in Chemical and Process Engineering from Moi University, a Diploma in Energy Planning and Use from Life Academy, Sweden; and is currently pursuing a Master’s degree in Sustainable Energy Engineering from Kenyatta University.

He is a registered member of the Institute of Engineers of Kenya (IEK), Engineers Board of Kenya (EBK), the Association of Energy Professionals East Africa (AEPEA), the Institute of Directors (IoD) Kenya and the Institute of Leadership and Management (ILM), United Kingdom.

Dr. Roger Petry



Dr. Roger Petry is a Professor of Philosophy at Luther College at the University of Regina teaching in the areas of sustainable development, ethics of science and technology, philosophy of religion, and critical thinking. His research explores university innovation for sustainability and strategic dimensions in moving to sustainable production systems. This includes examining historic transitions to new production systems and the role played by disruptive technologies. He coordinates the Philosophy, Politics, and Economics (PPE) Program at the University of Regina and Co-coordinates its Certificate in Sustainability. Dr. Petry is Co-coordinator of the *Regional Centre of Expertise on Education for Sustainable Development (ESD) in Saskatchewan* (RCE Saskatchewan (Canada)) acknowledged by the United Nations University in 2007 and Co-leads the International Association of Universities (IAU) Higher Education Cluster on *Responsible Consumption and Production* in support of UN Sustainable Development Goal #12

Dr. Beatrice Muganda



Dr. Beatrice Muganda is the Director of Higher Education at the Partnership for African Social and Governance Research (PASGR). Dr. Muganda is an accomplished educationist with expertise in programme planning, design and implementation. She has facilitated formal partnerships among African universities; with Northern partner universities and international knowledge networks around innovative projects that promote excellence, relevance and access in higher education at both masters and doctoral levels. Currently, Dr. Muganda leads the Pedagogical Leadership in Africa (PedaL) project, working closely with multiple partners in distinct contexts to drive sustainable change in delivery of university programmes to strengthen graduate competencies. She has trained over 1000 teaching staff in 60 universities on the African continent in innovative pedagogies. Dr. Muganda has extensive knowledge of issues,

challenges and opportunities in African higher education and has proactively engaged a variety of policy actors on higher education transformation. She has also been involved in education policy debates globally: EU-Africa policy dialogues, Wilton Park dialogues, The Africa-America Institute, London School of Economics Africa Summit, Africa Sciedev, University World News, Guardian Global Development Professionals Network, and the Association of African Universities. She has contributed to Kenya national policy documents such as the Medium Term Framework on Education and Training for Vision 2030, and the National Manpower Survey. She holds a B.Ed and M. Phil in Planning and Economics of Education from Moi University, a PhD from the University of Athens, and has received further training at the International Institute of Educational Planning in Paris.

INTERACTIVE SESSION WITH ACE II - PTRE PARTNERS

DAY 2: THURSDAY 13TH AUGUST, 2020 from 14.00 – 16.00 hrs Kenya, 1300hrs Paris, 1900hrs Beijing, 0500hrs Regina

Theme: Embracing Collaborative Research.

SYNOPSIS: In this two-hour plenary session of the conference, the ACE II-PTRE partners will discuss issues on collaborative research. The discussion topics will focus on: developing and implementing collaborative research, contract researching, research & development in industries, research ethics, intellectual property, and impact of pandemics on collaborative research.



ACEII - PTRE PARTNERS PLENARY SESSION



DISCUSSION TOPIC: COLLABORATIVE RESEARCH

MODERATOR



Harness Sakwa Mukhongo,
(HSC), Vice President
Association of Energy
Professionals Eastern Africa

CO-MODERATOR



Dr. Kenneth Chelule,
Chief Research Scientist,
Kenya Industrial Research and
Development institute (KIRDI)

PANELISTS



Vesa Korhonen
Chief Executive Officer
NOCART



Prof. David K. R. Tuigong
Chief Executive Officer
Kenya Industrial Research and
Development institute (KIRDI)



Mr. Dominic Wanjihia,
Founder & Chief Executive Officer,
Biogas International Limited.



Simeon K. Mining is
Professor of immunology at
Moi University, School of
Medicine and Director of
Research, Moi University



**Prof. Samson
Rwahwire,**
Director, Graduate Studies,
Busitema University.



Dr. Simon Githuku,
Research & Fiscal Policy Manager,
Kenya Association of Manufacturers
(KAM)



Dr. Alice Mutiti Mweetwa
Deputy Executive Secretary
Programme Development and
Implementation
RUFORUM



BIODATA FOR ACEII-PTRE PARTNERS IN icptre2020 PLENARY SESSION

Harness Sakwa Mukhongo, (HSC)



Harness is a founder member of the Association of Energy Professionals (Eastern Africa) –AEPEA. He currently serves as the Vice President and Head of Capacity Building and previously served as Head of Strategy & Operations of AEPEA. He is a member of the Professionals Trainers Association of Kenya (PTAK). He holds a MSc Energy Management, BSc Mech Eng. Harness specializes in energy efficiency and renewable energy and is a Certified Energy Manager (CEM), Certified Measurement and Verification Professional (CMVP), and Licensed Energy Auditor Grade “A”. He was a senior lecturer at the Defence Forces Technical College (DEFTEC) for eight years before joining KenGen where he is the Chief Engineer Technical Assurance. He has been awarded Head of State Commendation (HSC) and World Intellectual Property Organization (WIPO) Medal for Inventors medal for his work in research and innovation.

Dr. Kenneth Chelule



Dr Kenneth Chelule is a Chief Research Scientist at Kenya Industrial Research and Development Institute (KIRDI). He is an expert in medical device and processing equipment. He is the immediate former Deputy Director in charge of Research, Technology and Innovation at KIRDI. Previously he worked for Johnson & Johnson (J&J) both in Kenya and United Kingdom. Other organisations he has worked for include Finsbury Orthopaedics (UK), Orthodynamics (UK), University of Leeds (UK), Western College of Science and Technology (WECO), Rift Valley Institute of Science and Technology (RVIST). Dr Chelule holds PhD and MSc degrees in Mechanical Engineering from Staffordshire University, UK as well as Executive MBA degree from Jomo Kenyatta University of Agriculture and Technology (JKUAT).

He is an Advisory Council Member of Emerging African Innovation Leaders - Politecnico di Milano (Italy), a Group of 7 industrialised countries exchange and empowerment program. He is also Advisory Council Member of Konza Innovation Ecosystem Initiative (Kenya).

Dr Chelule notable achievements include setting up of Nairobi Surgical Skill's Centre (NSSC), a Public Private Partnership between University of Nairobi and Johnson and Johnson (UK) for training of surgeons, nurses and healthcare professional in Africa. In 2003, he was recognised by the H.E. Sam Nujoma, President of the Republic of Namibia for his contributions in implementing computer program for rural schools in Africa. He has published 4 papers in refereed journals, several conference papers, policy documents and has 4 patents, for which one has been licensed to a UK company. He has supervised students at both masters and PhD levels. He has keen interest in developing capacity (infrastructure and human capital) for innovations in Africa.

Vesa Korhonen



Vesa Korhonen, Chief Executive Officer, Nocart, has more than 20 years of experience in designing and managing power solutions in renewable energy and industrial automation. He held senior management roles with ABB and Schneider Electric before starting his own company providing technology to generate power from almost any available energy source. He has experience in working with large industrial power applications and also scaling smaller installations to produce economically viable power projects. His company has delivered hundreds of power plant systems and complete small and medium range power plants globally. He has overseen industrial and humanitarian power generation installations in Africa, Europe and Asia.

Dominic Wanjihia, Founder & Chief Executive Officer, Biogas International Limited.



I am tinkerer, a maker and an innovator.

Flexi Biogas Solutions is only 1 of numerous gadgets and "toys" I have developed over the years. I have the knack of being able to spot challenges faced by people in different situations, and develop simple solutions. Of course replicability and sustainability being key. I focus my energy on developing gadgets and tools with poverty alleviation of poor communities, recycling, affordability, contemporary agro practices and conservation in mind.

Flexi Biogas Solutions wears many hats. Climate smart agriculture, reduction of deforestation, water & waste management, invasive weed management, reduction of carbon & GHG emission, reduced indoor pollution, healthy soil building, organic fertiliser for sustainable food security, clean air & better health, better time management, produce value addition & job creation the list goes on. Tel: +254 (0) 724316992, Office: +254 (0) 722700530, Email. info@biogas.co.ke, biogasinternational@yahoo.com, Website: www.biogas.co.ke

Prof. David Tuigong



Prof. Tuigong has held a number of management positions spanning over 20 years. Currently, he is the CEO of Kenya Industrial Research and Development Institute (KIRDI). As the CEO his role entails leading the KIRDI team to achieve operational excellence and ensure execution of the core mandate; which is to undertake industrial research, innovation and development in engineering, material, environment, chemical and natural products sciences, energy resources and emerging technologies. Since becoming CEO, he has led a strategic and cultural transformation at KIRDI to ensure that the Institution develops into a global centre of excellence in industrial research.

He is a professor of Textile Engineering of Moi University, and prior to joining KIRDI, he served as the Deputy Vice Chancellor – Finance at Moi University. He is the Founding CEO of Rivatex a facility of Moi University. In his career at Moi University, he has taught undergraduate and graduate students in the department of Manufacturing, Industrial and Textile Engineering, School of Engineering. He has also supervised a number of graduate students of Moi University among other universities.

He holds a Doctorate of Engineering (Textile Engineering) degree from Donghua University, Shanghai, China; Master of Engineering degree in Textile Technology from Ghent University, Belgium; and a Bachelor of Technology (Textile Engineering) from Bharathiar University, India.

Prof. Tuigong has several publications to his name and is a member of Kenya Institute of Management; International Society of Engineers Education; Registered Graduate Engineer; Member of the Textiles Institute – Manchester, UK. His contribution in the community service has seen him serve as the chairman of various local Institutions and sitting as a member in others.

Prof. Simeon K. Mining



Prof. Simeon K. Mining is Professor of immunology at Moi University, School of Medicine and Director of Research, Moi University. He serves as Director of the Kenya National Innovation Agency, Chairman Board of Directors, St Lukes Orthopedic and Trauma Hospital, Eldoret, Kenya, Team Leader Development of Research uptake Sub-Saharan Universities funded by Wellcome Trust through Association of Commonwealth Universities, Co-Chair, Basic Science working group AMPATH, President and member Kenya Society of Immunology, Coordinator Moi-Linköping funded projects, School of Medicine, Moi University Student and Staff exchange Linnaeus Palme Project, He also serves as International Advisory Editor, Tanzania medical journal and member of the editorial board of East African Journal of Pathology. He previously served as member of IREC

MTRH - Moi University and National Bioethics Committee from 2011 to 2018. He holds a PHD in Parasite Immunology from The University of Liverpool, UK 1992, DVM, MSc from Moscow Vet Academy and an honorary Doctor of medicine from Linköping University, Sweden. His publications can be accessed on *Moi University Google* <http://scholar.google.com/scholar>.

Prof. Samson Rwahwire



Prof. Rwahwire is an Associate Professor of Mechanical and Materials Engineering and the Director, Graduate Studies at Busitema University. He is also the Next Einstein Forum Fellow (2019 - 2021).

Dr. Simon Githuku



Dr. Simon Githuku is currently the Research & Fiscal Policy Manager, Kenya Association of Manufacturers. Previously worked with the Kenya Institute for Public Policy Research Analysis (KIPPRA) as a policy analyst. He has over 10 years in public policy research & analysis. He holds a PhD in Economics, Kenyatta University. His Areas of expertise include Industrial, international and macroeconomic analysis.

Dr. Alice Mutiti Mweetwa



Dr. Alice Mutiti Mweetwa is the Deputy Executive Secretary - Programme Development and Implementation, she joined RUFORUM from University of Zambia where she worked as the Deputy Director for Research and Post Graduate Studies of the University of Zambia (UNZA), a position she held since 2017 and was the immediate past Deputy Dean for Post Graduate Programmes of the School of Agricultural Sciences. She served on several University boards and committees for quality assurance, policy formulation, income generation, Senate, journals publication, among others. Dr Mweetwa is a Senior Lecturer of soil microbiology and general soil fertility in the Department of Soil Science. She has a bachelor's degree in Agricultural Sciences (Crop Science Major) from

UNZA, a master's degree in Agronomy also from UNZA, a master's degree in Environmental Science from Miami of Ohio, and a Doctoral degree from Virginia Polytechnic Institute and State University. Since joining the University of Zambia in 2010, she has mentored a total of 38 undergraduate and post graduate students with whom she has published in several international peer-reviewed journals. She is an awardee of the 2017 Young African Researcher, 2016 National Science and Technology Merit Award and the Norman E. Borlaug International Agricultural Science and Technology Fellowship Program 2012. Dr Mweetwa is currently involved with several funded projects. Dr. Mweetwa joins staff at the Secretariat from diverse countries of Ghana, Sudan, Zimbabwe, Benin, Democratic Republic of Congo, Zambia and Uganda.

INTERACTIVE SESSION WITH IAU HESD CLUSTER TEAM FOR SDG 12

DAY 2: THURSDAY 13TH AUGUST, 2020 from 16.00 – 17.00 hrs Kenya, 1500hrs Paris, 1900hrs Beijing, 0700hrs Regina

Synopsis: Sustainable Consumption and Production (SCP) and COVID-19

Responsible Consumption and Production (SDG 12) Team Members Panel of the International Association of Universities (IAU) Higher Education and Research for Sustainable Development (HESD) Cluster for the UN SDGs

Prepared by IAU HESD Cluster on SDG 12 Cluster members: Zinaida Fadeeva, Detlev Lindau-Bank, Margit Stein, Kenneth Ochoa, Rose Ramkat, Roger Petry and Jocelyn Crivea

The current crisis is an opportunity for a profound shift to SCP at universities. The emergence of COVID-19 has shown us the limits of growth. We must try to understand and appreciate the limits to which humans can push nature before negative thresholds are reached. Those limits must be reflected in our consumption and production patterns at universities while employing COVID-19 a catalyst for social change. However, the effects of the COVID-19 crisis are so serious that our success at achieving the SDGs in recent years could be seriously undermined if not destroyed. From the point of view of sustainable production and consumption, we need to focus on the essential products of universities, namely services to scholarship and communities through teaching and research both of which are severely affected by COVID-19.

It is very much in response to the prevailing frugal attitude of universities that call 'non-essential' all those scholarly activities that do not focus on conventional hard core metrics of peer review publications, numbers of students and, ultimately, competitive university rating and ranking systems that this panel is framed.

In our view, four aspects are crucial to understanding the current situation:

1. The measures to contain the pandemic lead to a decision-making structure in universities that can be described as a top-down, managerial, and hierarchical. Scholars are getting used to regulation from above that impairs freedom of teaching, research, and models of service.
2. The necessary concentration on virtual teaching and virtual scientific exchange affects the quality of HEI. We know far too little about where, when and under what circumstances in-person teaching and face-to-face communication is essential to good learning.
3. Virtual teaching discriminates against people who have no or poor access to the necessary technologies or resources used to mediate these teaching methods.
4. The above-mentioned orientation of science to conventional standards (peer review, ratings etc.) is based on a growth-oriented and competitive understanding of science, which while potentially strengthening disciplinary research loses sight of transdisciplinary approaches, especially those needed for locally adapted patterns of responsible consumption and production.

With these concerns in mind, our panelists will address the following questions:

1. What are the risks and opportunities - in both the short and long term - for the Higher Education Institutions (HEIs) that choose to focus on “frugal” or more traditional patterns of scholarship for rationing resources and survival?
2. How have recent changes with COVID-19 created potential opportunities in HEIs for new, more sustainable patterns of production and consumption of scholarly and other resources?
3. How will we have to shape the core tasks of HEIs (e.g., in research and teaching) in the future?
4. What role can the UN SDGs, especially SDG 12 on Responsible Consumption and Production, play in shaping new collaborations within and between HEIs and the communities they serve to create HEIs for our times?



ACEII - PTRE VIRTUAL CONFERENCE PLENARY SESSION



TOPIC: Sustainable Consumption and production (SCP) and COVID - 19

Responsible Consumption and Production (SDG 12) Team Member Panel of the International Association of Universities (IAU) Higher Education and Research for Sustainable Development (HESD) Cluster for the UN SDGs

PANELISTS

MODERATOR



Dr. Zinaida Fadeeva
Visiting Professor,
Nalanda University (India)
Universiti Sains Malaysia



Dr. Roger Petry
Professor of Philosophy
Co-coordinator, RCE
Saskatchewan
Cluster Co-Chair, SDG 12
Luther College at the University
of Regina (Canada)



Prof. Kenneth Ochoa
Director of Environmental
Engineering
Faculty of Engineering
El Bosque University
(Colombia)



Prof. Dr. Margit Stein
Prof. for Education
University of Vechta
(Germany)



Mr. Detlev Lindau-Bank
Researcher for
Education and Social
Work
Chair of RCE
Oldenburger
Münsterland
University of Vechta
(Germany)



Dr. Rose Ramkat
Moi University (Kenya)
Head of Department,
Biological Science and
Deputy Center Leader ACE
II PTRE

DISCUSSION QUESTIONS

1. What are the risks and opportunities - in both the short and long term - for the Higher Education Institutions (HEIs) that choose to focus on "frugal" or more traditional patterns of scholarship for rationing resources and survival?
2. How have recent changes with COVID-19 created potential opportunities in HEIs for new, more sustainable patterns of production and consumption of scholarly and other resources?
3. How will we have to shape the core tasks of HEIs (e.g., in research and teaching) in the future?
4. What role can the UN SDGs, especially SDG12 on Responsible Consumption and Production, play in shaping new collaborations within and between HEIs and the communities they serve to create HEIs for our times.



BIODATA FOR PANELISTS OF IAU HESD CLUSTER ON SDG 12 DURING icptre2020 CONFERENCE

Prof. Dr. Zinaida Fadeeva



Prof. Dr. Zinaida Fadeeva is currently a Visiting Professor at Noland University in India and at the Centre for Global Sustainability Studies in University Science Malaysia. She obtained her PhD in Environmental Management and Policy from The International Institute for Industrial Environmental Economics (IIIEE), Lund University, Sweden. A senior specialist in policy and practice of sustainable consumption & production (SCP) with 25 years international professional experience, 17 years thereof with UN agencies on practical solutions covering waste management, resource efficiency & circularity, climate change, biodiversity, health, business and policy. She has taught sustainability at a number of Universities in China, Japan, India and Sweden. She has been associated with TERI School for Advanced Studies (SAS) as Visiting Professor. She is also an advisor to the EMPRETEC Programme of UNCTAD for India. She has

been a Senior Consultant, UNIDO for the preparation of the background document on marine plastic pollution in the context of circular economy for the G20 countries; Senior Advisor, Office of the UN Resident Coordinator (New Delhi) for advising on capacity development and coordination in the area of circular economy and work on development of the proxy SDG 12 indicators. She has been a Visiting Scholar, United Nations University Institute for the Advanced Studies for Sustainability (UNU-IAS), Tokyo, Japan where she was engaged in policies and strategies with a particular focus on sustainable consumption and production and SDGs. She has been leading research activities of the ESD team of UNU-IAS since 2003. She has been a Senior Development Advisor, UNEP and UNDP – contributor to drafting team for the Environmental Code for Cambodia, particularly on sustainable consumption and production, access to information and environmental education.

Prof. Dr. Margit Stein



Prof. Dr. Margit Stein is Professor for Education at University of Vechta (Germany), born in 1975, has a degree in psychology and pedagogy and has worked as a professor since 2009, first at the University of Applied Sciences Nordhausen (Thuringia), and since 2010 as a professor at the University of Vechta (Lower Saxony). Her research focus in the field of adolescents and young adults includes research on values and education, intercultural coexistence, growing up socialization in rural areas and education for sustainable development.

Detlev Lindau-Bank, Researcher for Education and Social Work, Chair of RCE Oldeburger Munsterlan University of Vechta (Germany)



Detlev Lindau-Bank, born in 1960, is a graduate social pedagogue and educational scientist and has been working, researching and publishing for 28 years on the subject of school development, education for sustainable development and childhood and youth in social change. For 10 years he has been developing concepts for regional youth reporting in rural areas as a supplement to national and international youth reports. Against this background, in 2018 they founded the focus area “Ruractics” at the University of Vechta as the subject of research and teaching for didactic concepts and methods of school and extra-curricular education in rural living environments. Ruractic is interdisciplinary and based on the knowledge of educational science, psychology, sociology and cultural studies. The word ruractics is the fusion of rural (rural, rural) and didactics.

Kenneth Ochoa, Director of Environmental Engineering, Faculty of Engineering, EL Bosque University (Colombia)



Kenneth Ochoa is an Environmental Engineer from El Bosque University with courses in environmental prevention strategies at Lund University. Master in Environmental Management at the Universidad de Los Andes. He is a candidate for a PhD in Cleaner Production and Industrial Ecology from the Erasmus University of Rotterdam.

He is the director of the Environmental Engineering Program, research coordinator at the School of Engineering and Associate Professor at El Bosque University in Colombia. He has also served as the director and coordinator of environmental engineering projects as well as national and international consultant. With UN Environment, he has participated as Youth Advisor, as well as consultant in Sustainable Consumption and Production, Evaluation and

Early Warning and Environmental Education. He is representative for Latin America and the Caribbean in the Science and Technology Group of the Ten-Year Framework of Sustainable Production and Consumption Programs, associated with Goal 12 of Sustainable Development.

Dr. Rose Ramkat, Deputy Center Leader ACEII - PTRE



Rose Ramkat has a PhD in Natural Resources and Applied Life Sciences from BOKU University, Austria. She has MSc and BSc degrees from Egerton University, Kenya. She has undergone trainings on Pesticides and food safety in integrated pest management, food safety policy and institutional innovations in Wageningen University, Netherlands. She worked previously for the Ministry of Agriculture, Kenya and has experience working with communities on extension and research projects with a focus on Sustainable Production and Consumption, Renewable Energy and Agri-nutrition system focusing on utilization of agrobiodiversity for improved nutrition. Currently, she is the Deputy Center leader and Principal Investigator for the Africa Center of Excellence in Phytochemicals, Textile and Renewable Energy (ACE II – PTRE, Moi University, Kenya). Also, she is the Head of Department Biological Sciences and a member of the IAU HESD Cluster for the UN SDG 12.

She is involved in teaching, examination of undergraduate and postgraduate students and has published articles in various journals.

TASKS & ROLES OF CHAIR, MODERATOR, CO-CHAIR AND IT SUPPORT

1. SESSION CHAIR AND MODERATOR

- ✓ He/She is the Chair/moderator of Session.
- ✓ Understand the Conference Goals & Objectives - what is to be achieved.
- ✓ Introduces the presenters (**ONLY**), therefore gets short bios of presenters in advance.
- ✓ Ensures the speaker does the best job and the audience gets the most out of the session(s).
- ✓ Identify Audience Expectations and gauge attendance interest.
- ✓ Administers Q&A sessions.
- ✓ Know your voice; act with poise and confidence to keep sessions progressing.
- ✓ Schedule Rehearsal(s). Schedule dry runs a few days before live session(s).
- ✓ Closes out conference sessions they are chairing.

2. SESSION CO-CHAIR

- ✓ Chairs the session when chair is not in or encounters technical hitches.
- ✓ Monitors the chat comments and questions and responds to some.
- ✓ Asks the audience questions from the chat to be directed to a given individual speaker.
- ✓ He ensures the participants stick to their allocated time.
- ✓ Makes remarks during Q/A session.

3. SESSION RAPPORTEUR

- ✓ He/She is the Secretary/reporter of the session.
- ✓ He/She summarizes key points from each speaker.
- ✓ This provides additional value of what the speaker said.
- ✓ Record presenter details such as Title, Objectives, Session, Questions and Comments
- ✓ Rapporteurs should check in advance when they are in for session rapporteuring.
- ✓ Rapporteurs can be given 3-5 minutes to present key points at the end of session.
- ✓ Monitors chat comments/questions when the chair/co-chair is not in or encounters technical hitches
- ✓ Chairs the session when chair/co-chair is not in or encounters technical hitches.

4. INFORMATION TECHNOLOGY (I.T) TECHNICIAN

- ✓ He/She provides technical support for the conference.
- ✓ Prepares in advance on connectivity of both the hosts and the participants.
- ✓ Creates the conference session links and the invitation emails.
- ✓ He/She should plan for technical hitches issues and know how to solve them.
- ✓ Records the sessions and upload on conference portal at the end of the day.
- ✓ Concerned with anything and everything on bandwidth, browser, connectivity and access to the virtual conference.
- ✓ They should be knowing and having backup plans to ensure success of Virtual Conference.
- ✓ Ensure they collect and sort the slides for their conference sessions a day before the sessions
- ✓ Ensure they collect and sort all video recorded presentations for speakers and conference presenters a day before the respective sessions and run them where the presenters have technical challenges.

Icptre2020 CONFERENCE SUPPORTERS AND ACE II-PTRE PARTNERS



IAU HESD CLUSTER
ON SDG 12



ADDITIONAL INFORMATION ON ACEII PTRE ACHIEVEMENTS



Dr. Rose Ramkat
Deputy Center
Leader, ACEII-
PTRE

The manufacturing sector is considered to be contributing only 10%¹ of Kenyan Gross Domestic Product. However, the sector is projected to play a critical role in the economic growth of the country and the region at large. This achievement would require an increase in highly skilled personnel in the area of Science, Technology, Engineering and Mathematics (STEM) to facilitate the manufacture of skill-intensive products of high value and quality. However, the Eastern and Southern Africa lags behind other regions in higher education and research output in Science and Technology. This is evident from regional surveys which reveal that firms experience acute challenges in filling technical and managerial positions, not just due to the inadequate number of graduates but also due to low quality and relevance of their education and training². In particular, inadequacy in personnel and in particular female with advanced training in textiles, phytochemicals and renewable energy fields has been confirmed. To bridge this skill gap, ACE II PTRE in collaboration with national, regional and international partners has taken a lead in contributing

towards a regional solution of transforming Science and Technology in Africa for the manufacturing sector through targeting to achieve the following outcomes by end of the project period;

- Admit and train 30 PhD students and 60 MSc students in areas of manufacturing involving Analytical Chemistry, Textile, Industrial Engineering and Renewable Energy
- Procure, install and commission teaching and research facilities
- Develop a new curriculum for MSc in Sustainable Energy & Energy Access and review ongoing MSc and PhD programs to support training needs
- Upgrade ICT at PTRE Center for an enhanced learning environment
- Host at least 1 international conference
- Organize at least 4 community outreach/extension activities to provide technical services
- Offer at least 3 Re-tool workshops to faculty in areas relevant to the ACE II - PTRE thematic areas, curriculum delivery and supervision.
- Make at least fifty (50) high impact publications by the end of the project period.
- Facilitate at least 50 student/staff on exchange to other institutions and host those incoming on exchange to the Center.
- Initiate linkages with industry and hold at least 3 major meetings with the industrial linkage committee members.
- Undertake 5 self-evaluations workshops jointly with the stakeholders.
- Organize 4 annual meeting with partners by the end of the project period.
- Collaborate with private and public sectors/industries to grant internships to at least 90 ACE students and staff
- Develop and offer at least four (4) short courses relevant to stakeholders needs.
- Initiate and support at least 6 research project collaborations in the areas of Phytochemicals, Textile, Industrial Engineering and Renewable Energy.
- Participating in the Partnership for skills in Applied Sciences, Engineering & Technology (PASET) regional benchmarking initiative to strengthen African Universities

¹Kenya Vision 2030, A globally Competitive and Prosperous Kenya, (2007), Government of Kenya

²World Bank 2016, A Regional Solution to Transform Science and Technology Education in Africa

Student enrolment at ACE II –PTRE Center

To this far, the ACE II PTRE Center has surpassed its target by admitting 135 MSc (56Male, 39Female) and 40 PhD (27Male,13Female) students enrolled in PhD and MSc in Energy Studies, PhD and MSc in Analytical Chemistry, PhD in Materials and Textile Engineering, MSc in Industrial Engineering and MSc in Textile Engineering. The regional students are from Malawi, Zambia, Uganda, Tanzania, Rwanda, Ethiopia, Sudan, South Sudan, and Zimbabwe. Strategically, for the Center to meet the project requirement on the number of regional and female student's enrolment, the regional students have been supported through partial scholarships. In addition, the criteria for awarding partial scholarships, awards five extra points to a female applicant which gives them a better chance of getting the partial study scholarships. This award criteria gives priority to female PhD students from marginalized areas/countries <https://excellencecenter.mu.ac.ke/wp-content/uploads/2019/09/ACE-II-PTRE-SCHOLARSHIP-SCORE-SHEET.pdf>. The female students receive various forms of support including: fees payment, partial support scholarships, research funds, accommodation, exchange programmes, short courses, internship, publication fees and fund for purchasing laptops (<https://excellencecenter.mu.ac.ke/wp-content/uploads/2020/07/SUPPORT-TO-FEMALE-STUDENTS-UNDER-ACEII-PTRE SCHOLARSHIP.pdf>.)

Social support and mentorship of students

The Center has provided accommodation to all regional students and national female students who choose to stay within the university facility. Also, the ACE II PTRE has made special arrangement for housing/accommodation for female students with families and children so that they can stay with a baby-sitter to take care of their babies during study time. This has made it possible for the female students to undertake their studies without interruption and to be on track in order to complete studies within the recommended duration. In addition, students with families having small kids have been linked to the kindergartens and primary schools within the university and neighbourhood so that they can make a decision on the preferred choice of schools for their children. The kindergartens have made it possible for the female students to have extra care and support for their young children https://www.youtube.com/watch?v=0_9yFTKh150. Further, the ACE II –PTRE Center has offered language support to students from non-English speaking countries. This has enabled them undertake course work, develop and defend their research proposals on time (https://youtu.be/s4S_b1du-00).

Mentoring of students has been done through supporting them to undertake short courses and exchange programs to other institutions within the nation, regional and internationally <https://excellencecenter.mu.ac.ke/index.php/2019/05/16/ms-joan-kiptarus-staff-exchange-at-kirdi/>, <https://excellencecenter.mu.ac.ke/index.php/2020/07/08/exchange-programme-at-university-of-port-harcourt/>. More mentorship has been offered through integrating students to faculty and partner teams to develop and offer short courses with examples being courses on soap making and application of natural dyes for the textile cottage industry (<https://youtu.be/bvUc2GpOoII>). To enhance the social relationship of students and ACE II- PTRE team members, the Center has undertaken joint activities between students and staff for team building which include excursions, joint dinners and student orientation



ACE II PTRE team members and student during an excursion at Kerio Valley and Cheploch

<https://excellencecenter.mu.ac.ke/> @ACEIIPTRE, ACEII PTRE ACEIIPTRE

Development and review of curricula

The ACE II-PTRE Center of Excellence has so far developed three new curricula. The curricula were developed after a needs assessment for their relevance in the manufacturing sector. The three curricula developed include; MSc Analytical Chemistry, PhD in Analytical Chemistry and PhD in Textile and Material Engineering. The Curricula were developed by faculty members from School of Sciences and Aerospace Studies and School of Engineering. In addition, stakeholders from industry/private sector were involved in development of the curricula through participation in joint workshops with staff from the two schools. These curricula were afterwards accredited at the national level by The Commission for University Education (CUE), Kenya upon meeting the required standard of support facilities for curricula delivery. In addition, three (3) curricula; MSc and PhD in Energy Studies and MSc Textile Engineering have been reviewed. Stakeholders were involved in this review process to further strengthen the quality of the curricula and shape them in line with the market and industry demands as per societal needs and relevance. Currently, the Center has signed a contract agreement with M/S. AQAS: Agency for Quality Assurance, Cologne, Germany to undertake the process of international accreditation for two PhD programs (PhD in Textile and Material Engineering and PhD in Energy Studies).



Prof. K. Ongeti, Deputy Director Quality Assurance, Moi University making a contribution during the stakeholders meeting on Curriculum review for MSc and PhD in Energy Studies held in Nakuru, at the Egerton University Agriculture Resource Center

Enhancing skill development through supporting student and faculty exchange

The ACE II-PTRE has so far sponsored forty one (41) faculty members from the center on an exchange program (<https://excellencecenter.mu.ac.ke/index.php/category/staff-exchange/>). In addition, the center has hosted faculty and staff from the industry on exchange to the Center. During the exchange, faculty members were able to work on ongoing research projects, identify possible areas for undertaking joint research, developed joint publications and proposals for funding

Some of the staff exchanges done include;



Staff exchange to University of Gezira, Sudan by Dr David Njuguna

During the exchange, Dr Njuguna made a courtesy meeting with University management: Deans Academic Affairs, Director External relations and International Cooperation, Dean of Faculty of Industries Engineering and Technology (FIET), Deputy Dean of FIET and HODs in the FIET. In addition, presentations were made to show case ongoing researches at University of Gezira and possible areas of joint research were proposed as:

- Production, processing and utilization of Kenaf fibres in the Manufacture of green panels for innovative furniture, partitioning system and other applications.
- Eco-friendly dye-ability, antimicrobial and insect repellent properties of textile fabrics functionalized with plant extract.
- Potential of Sudan in Renewable Energy
- Extraction of natural dyes from plant and their applications on natural textiles
- Extraction of Eco friendly dye from *Acacia nilotica*



Staff Exchange to University of South Africa (UNISA) by Dr Korir Kiptiemoi and Dr Fredrick Nyamwala

During the exchange, the faculty members gave a seminar talk on the following topics:

1. ZnO/TiO for Energy Harvesting: Ab initio Study, presented by Dr. Korir Kiptiemoi
2. Modelling Optical Properties, presented by Dr. Nyamwala Fredrick



Dr. S. A. Odhiambo viewing the energy storage devices under lenses at Ugent, Centre of Textile Science & Engineering, Ghent University Belgium during staff exchange

Staff exchange to Ghent University, Belgium

During the exchange, Dr Sheilah did research on Textile based energy storage devices for smart textile application. In this work, functional energy storage devices well integrated into textiles. The results obtained from the validation experiments were used in the publication "The electric energy stored in PEDOT: PSS capacitors integrated on textile substrate: limits and possibilities" published in International journal of clothing science and technology a peer reviewed journal.



Staff Exchange to Nyeri County Referral Hospital

The exchange involved mapping operation and maintenance related challenges of dialysis equipment. The mapping entailed collecting data/information on challenges associated with operating and maintaining dialysis equipment, which include user-knowledge on the equipment, lack of critical spare parts, and technological complexities associated with the dialysis equipment. For addressing the challenges, Dr. Chemweno from Moi University closely collaborated with colleagues from Dedan Kimathi University of Technology (DeKUT), and University of Leuven (KU Leuven) where they developed draft protocols for addressing technology transfer challenges for critical medical devices. The staff exchange also facilitated preparation of a proposal for sourcing more funding.

Dr Peter Chemweno from ACE II –PTRE, Moi university and Ms. Diana Njuguna from DeKUT at the dialyzer equipment at Nyeri County Referral Hospital during a Staff Exchange

Community Outreach/Extension Campaigns

1) Championing application of natural dyes for textile cottage industry

The production of synthetic dyes currently used in Kenya is dependent on petrochemical source; most of which usually contains toxic or carcinogenic amines that are not eco-friendly. To mitigate these adverse effects, appropriate technologies exploring natural resources as phytochemicals for natural dye production cannot be over-emphasized. Hence, ACE II – PTRE supports the application of natural dyes in cottage industries. Through partnership with Supporting Indian Trade and Investment for Africa (SITA), a short course on natural dyes was developed and offered at Moi University, Main Campus, Eldoret. The course trainees were 23 hand weavers drawn from Kenya (5 Male, 7 female) and Uganda (4 Male, 7 Female). The dyes used during the training were extracted from locally available plants and weeds including the Mexican Marigold (*Tagetes minuta*). After the training and based on the interest expressed by trainees on use of natural dye to improve quality of products, ACE II PTRE offered the dying course as an outreach to Small Medium Enterprise (SME) group known as Ujirani Mwema na Amani (UMAC) and CREAM (Center for Rehabilitation and Cotton Management). Through this training, a total of 40 hand weavers (21 Female, 19 male) from UMAC group in Trans Nzoia County and (23 Female, 16 Male) from CREAM in Kisumu County were trained.



Participants undertaking a practical on dyeing at the Textile Laboratory at Moi University, which was renovated by World Bank through PTRE



Participants carrying out natural dyeing process during training exercise



Participants displaying a fabric dyed using natural dye extracted from Itula tree (*Commiphora africana*)



Invited guests from Moi University, Trans - Nzoia County and participants during a natural dye short course training held in Kitale National Polytechnic from 1st – 5th April, 2019

2) Enhancing sensitization on use of Renewable Energy

In the past, biogas adoption and usage in the country has been hampered by a number of factors, including: lack of extension services, poor dissemination strategy by promoters, poor planning and monitoring by promoters, and user unfriendly designs leading to gas pressure problems amongst others. This has made ACE II PTRE to be in the frontline of enhancing Renewable Energy use in the community. Through partnership between ACE II PTRE Center and Flexi Biogas International, biogas training was held at Kesses, Uasin Gishu in a farmer's homestead who had installed a biogas unit. This sensitization of the community on installation of biogas will go a long way in enhancing environmental management and reducing climate change effects through reducing deforestation. Also, biogas is clean to use since no smoke is emitted compared to using firewood which poses a health risk to the inhabitants of the home.

The youth constitute majority of the Kenyan population and empowering them to participate in activities focusing on resource efficiency and renewable energy uptake is key to the achievement of sustainable development. Thus, ACE II PTRE has trained students from four (4) high schools in Kenya with an aim to inspire future biogas champions who will promote biogas adoption in their communities.



Participants following a presentation at Kesses on feeding of the biogas digester and working of the biogas unit



Ms Naomi Nkonge (PTRE Administrator) observing a demonstration on feeding of the biogas digester using cow dung



Farmers store in Kesses filled with firewood used to feed the traditional cook stove. This enhances deforestation



Farmer's kitchen showing a traditional cook stove and wall covered with soot from smoke which is a health hazard to the inhabitants



Demonstrations on the ease of lighting a biogas cook stove and its cleanliness



Kapsabet Boys High School



Moi Girls High School



Kaptagat Girls High School



Paul Boit Boys High School

Biogas training for selected high schools from Uasin Gishu, Nandi and Elgeyo Marakwet Counties

3) Promoting community soap and detergent making

In line with the ACE II PTRE mission to provide, skilled and empowered human capacity in Phytochemicals, Textile and Renewable energy with the potential to develop innovative products of high value and quality, offer services and solutions for the industrial sector, a short course on soap and detergent was conducted to community members of Kesses. The aim of the training was to advance knowledge to the local communities, so that they are empowered and equipped to participate in a socio- economic generating activities. Hence, the local community was empowered on soap and detergent production techniques. Currently during the COVID 19 pandemic period, community members who were trained have been making soap which they have been selling to other members of the community. These community groups will be supported further for their products to receive certification (<https://www.youtube.com/watch?v=jvNDGibch6E&t=122s>).



Community members undertaking a practice on soap making



Community members displaying soap made during the training exercise

Renovation of laboratories for teaching and research

The Center has renovated four (4) laboratories that are being used for practical and research by students and researchers. An example a renovated laboratory is the wet lab at the Department of Textile Engineering used for carrying out all practical's requiring chemicals for Textile and Industrial courses that include, extracting and application of dyes from plants and analysis of molecular structures in textile chemicals and substances. The Center has procured equipment for practical's in the laboratory which include: Rotary Evaporator, Compound Microscope with digital camera, Electrical Muffle Furnace for quantitative analysis, Forced Ventilation Oven for analysis of volatile substances in phyto-chemical extracts, Oil bath for temperature controlled analysis, Distillation unit for provision of de-ionized water for analysis, RAMAN Spectrophotometer for Molecular characterization, Hot-press for analysis for color fastness to hot pressing, Metallurgy microscope among others.



Textile wet laboratory before renovation



Textile wet laboratory after renovation

Renovation of these laboratories has enabled ACE II PTRE students to undertake innovative research which include among others:

1) Mechanical and thermal properties of sisal/cattail fibre reinforced polyester hybrid composites (by: Silas Mbeche) masters student in MSc Industrial Engineering)



Silas carried out research on the possibility of using a blend of cattail and sisal fibres as reinforcements to produce a polyester resin-based composite. Sisal and cattail fibre are natural reinforcements and therefore provide better alternative since they are bio-degradable, abundant, inexpensive and have excellent physical and insulation characteristics and high strength to weight ratio. Kenya produces approximately 25,310 tonnes of sisal fibres annually. Furthermore, little is known about cattail plant (*Typha angustifolia*) which grows wildly as a marginal weed in wetlands. Use of these fibres will result to the control of the invasive nature of cattail plant into water bodies, job creation, pollution control, wetland and forest conservation as cattail plant will be used as an economically alternative raw material.

Comparable mechanical and thermal conductivity properties were obtained from this study, therefore revealing that the hybrid composite may be used for non-structural applications such as ceiling boards, walls, room partitioning, door panels and electronic and food packaging.



2) Production and characterization of particleboard from leather shavings and waste papers (by: Tabitha Kibet, MSc student in MSc Industrial Engineering)



This project explored alternative materials for making particleboards from waste materials that are not susceptible to microbial attack while conserving natural resource such as wood. Since large quantity of leather solid wastes are generated by leather industries and these wastes are either thrown away or dumped in open lands, there was need of addressing waste disposal problem as well as producing a useful product. The main objective of this study was to design and produce a particleboard from leather shavings and waste papers through compression method, to determine the effects of resin content, blend ratio and fat treatment of particles on the properties of the board as well as to characterize the physical and mechanical properties of the fabricated board. From the results of this study it was concluded that leather shavings and waste papers can be used as alternative raw materials

for particleboard production and that physical and mechanical properties were depended on the resin content and the blend ratio. The product can also be used in ceiling, partitioning, flooring, car paneling and counters.



3) Evaluation of dyeing properties of *Prosopis juliflora* (by Mark Peter Odera, PhD student in Analytical Chemistry)



Prosopis juliflora commonly known as mathenge is a noxious and invasive plant occupying majorly arid and semi-arid regions of Kenya. When the pods of the plant are eaten by livestock especially sheep and goats, they lose teeth and in some cases die due digestive tract complications. The heartwood of the plant is reddish in colour and is full of antioxidants/ flavonoids such as mesquitol, catechin, and epicatechin among others. Because most yellow and brown natural dyes are flavonoids, it gave a guide to extract some natural dyes from the heartwood of the plant. This extraction was successful and gave 4 reliable dye shades with varying stabilities. Post mordanted samples were the most stable with the highest fastness. Dyeing was done at the Moi University labs at the School of Sciences and Aerospace studies lab and fastness tests were done at the RIVATEX Textile Labs, a facility of Moi University.



Initial Results in Pictures



Shades so far obtained are Khaki, Jungle green, dark brown and mid khaki

Leveraging on partnership for teaching, research and outreach activities

There is need for universities to introduce innovative competent-based learning models in order to improve the graduates' employability, enhance their capacity to adapt to the constantly evolving working environment and to develop expertise that meets the labor market demands. There is a great potential to achieve this goal if there are strong linkages between universities and the private sector/industry. To address this knowledge and skills gap between University and Industry, the ACE II-PTRE formed the Center Industrial linkage committee. This committee has held three (3) industrial meeting since inception. The meetings have brought together partners including: KAM, KIRDI, RIVATEX, FLEXI BIOGAS INTERNATIONAL, NOCART Africa and Community representatives to undertake joint discussions and plan for needed interventions. Also, the industrial linkage committee has organized and held joint workshops with students and faculty members to share on areas that the private and public sector need work on jointly with the University. These joint workshops have helped encourage students and staff to take part in the ongoing researches within the industry and develop joint publications.



Participants from Moi University ACE II-PTRE, partners including Kenya association of Manufacturer, Kenya Industrial Research and Development Institute, RIVATEX, FLEXI BIOGAS INTERNATIONAL, NOCART, KEBS and a Community representative during the 2nd Center industrial linkage committee meeting



Postgraduate students from School of Engineering and School of Biological Science, Faculty staff, Director School of Postgraduate studies, private and public sector partners during a workshop on Promoting University Partnership with Industry to build Collaborative Research Capacity and Solve Developmental Challenges in the Society

Strategies for Improving Quality and sustainability in ACE II-PTRE

1) Joint self-evaluation and partners meetings

The ACE II PTRE Center has held three (3) self-evaluation workshops together with Moi University Management, Deans of School of Engineering and School of Biological and Physical Sciences, PTRE Thematic Leaders, Finance officer, Procurement, Acting Chief Internal Auditor and ACE II PTRE team members. During the self-evaluation workshops, the challenges experienced by the Center are discussed jointly and solutions are provided. In addition, joint meetings have been held between ACE II PTRE partners (national and regional partners), ACE II PTRE team members, University Management and University Council to discuss on project implementation progress.



Moi University management, staff and ACEII PTRE team during a self-evaluation Seminar



ACE II PTRE national and regional partners, ACE II PTRE team members, University Management and University Council during a joint project meeting.

2) Sustainability measures

The ACE II PTRE has continued to develop more proposals to seek for additional funds in order to ensure sustainability of the projects beyond the project period. Some of the proposals that were successful include the projects:

- i) Transforming Energy Access-Learning Partnership (TEA-LP) Project
- ii) Phytochemicals, Textile and Renewable Energy Phytochemicals, Textile and Renewable Energy Incubation Center (PTRE IC). The ACE II –PTRE Center responded to a call by Inter University Council for East Africa IUCEA for African Centers of Excellence (ACEs) to host incubation centers. The proposal was successful and received independent evaluators for a site visit for further evaluation on the ability of the ACE to host an incubation Center.
- iii) Mobility for Innovative Renewable Energy Technologies (MIRET)



Courtesy call to the Vice Chancellor Moi University by IUCEA and independent evaluators during the evaluation exercise to host an Incubation Center at ACE II - PTRE. Front row from left: Fred David McBagonlurinuuri, Karin Ruiz Camilla. Back row from left: Prof Simeon Mining (Director Research), Ms. Dorine Rwehera (IUCEA), Prof. Isaac Kosgey (Vice Chancellor, Moi University) and Prof Daniel Tarus (Ag. DVC Finance)

ACE II-PTRE FUNDED PROJECTS

Transforming Energy Access-Learning Partnership (TEA-LP) Project

Project Background



*Eng. Prof. Augustine
Makokha (Project-PI)*

Moi University through the Centre of Excellence in Phytochemicals, Textile and Renewable Energy (ACEII-PTRE) won a grant of GBP 60,000 under the Transforming Energy Access-Learning Partnership (TEA-LP) to support the development of a multi-disciplinary Masters curriculum in Sustainable Energy & Energy Access to bridge the skills gap in Africa's rapidly-growing energy access sector towards achieving SDG7. The project is coordinated by University of Cape Town (UCT) in South Africa.

Currently less than 60% of the total population in Kenya has access to electricity, and this rate is lower than 30% for people living in rural areas. Providing a secure supply of electricity to people is essential for enabling socio-economic growth and development, as well as improving standards of living, health and wellbeing, and gender equality.

The TEA-LP project, which is funded by the UKaid under the Department for International Development of the United Kingdom (DfID), aims to support the development of high-level skills that will accelerate access to affordable, clean and safe electricity for households and enterprises. Growing a clean energy access sector in Africa will require people with the skills and competencies to develop innovative solutions and sustainable business models that will allow electricity, from new, clean and decentralised (including off-grid) technologies, to be supplied to consumers at affordable rates. The key challenge countries are facing in providing the necessary skills and expertise is a mismatch between graduates being produced by higher-education institutions, and the skills and multi-disciplinary competencies needed in the workplace. More details on TEA-LP website: <http://www.acdi.uct.ac.za/transforming-energy-access-learning-partnership>

Project Launching

The TEA-LP project was launched during a workshop held in August 2019 in Nairobi. This workshop aimed to develop a shared understanding of the TEA-LP principles and goals, share knowledge and expertise, as well as to network and develop relationships. Present at the workshop were several organizations working in the sector who offered their insights and reflections on skills needs. They included MECS, AMI and Energy4Impact.



*Moi University
team during
the TEA-LP
workshop in
Nairobi,
August 2019*

New Curriculum for MSc (Sustainable Energy & Energy Access)

The new degree programme being developed aims to address both technical and non-technical skills gaps in the clean and renewable energy sector. The degree represents a unique opportunity for high level training in the following areas: (1) Clean and sustainable energy technologies and systems, (2) Energy markets, policies and regulation, (3) Energy planning & management, (4) Renewable energy projects management, (5) Energy modelling and data analytics, (6) Energy entrepreneurship and Business modelling, (6) Community engagement. The programme aims to develop linkages with industry, giving students exposure to and opportunities to participate in real-life projects and gain hands-on experience.

Employer Needs Assessment Workshop

Moi University TEA-LP team organized a stakeholders' workshop that was held in Nairobi on 17th January 2020. This was an opportunity for stakeholders to clarify important sector needs and provide inputs on how best to implement the proposed master's program. The data and information obtained from the workshop informed the curriculum structure for the new Master's programme.



*Breakout session during
ENA workshop, January
2020*



Kenya



Nigeria



Uganda



Algeria



Malawi



Ethiopia



Lesotho

Establishment of Phytochemicals, Textile and Renewable Energy Incubation Center (PTRE IC) at Moi University



Eng. Prof. Simiyu Sitati
PTRE IC, Leader

Moi University through the Africa Center of Excellence in Phytochemicals, Textile and Renewable Energy (ACEII-PTRE) won a grant of US \$ 250,000 to establish the Phytochemicals, Textile and Renewable Energy Incubation Center (PTRE IC). The PTRE IC envisages being a thriving and sustainable innovation driven regional University incubator that creates a competitive product development, commercialization and entrepreneurial start-up ecosystem. The core mandate of the incubator is to provide targeted incubation support for technology-oriented entrepreneurial solutions with high transformative potential to generate employment and wealth.

The overarching goal of the incubator is to support new product development, innovations and commercialization of technology, enterprise launch and growth in its core areas of Phytochemicals, Textile and Renewable Energy. In pursuit of its business foundation the Incubator strives to foster an entrepreneurial culture and climate; encourage innovation and product development; commercialize technology; accelerate commercial and industry growth; encourage minority and women entrepreneurship; support innovative solutions to regional problems and build strong collaborations and networks. While pursuing the aforementioned strategic objectives, the Incubator is guided by innovativeness, integrity, quality and excellence, and accountability.

Presently, the PTRE IC has admitted and enrolled ten (10) incubatees who are now fully engaged in their initial incubation process through ideation, development of entrepreneurial skills, product and enterprise development, business coaching and mentoring. This is done through the provision of requisite infrastructure and environment that supports techno-managerial support for incubatees in the focus areas of phytochemicals, textiles and renewable energy.

Since inception, the PTRE IC has undertaken successful preparatory activities including development of operational policies, development of business foundations, strategic plan, business plan, and sustainability strategy, monitoring & evaluation and publicity materials among others. It has also carried out entrepreneurial boot camps, sensitization workshops for stakeholders, capacity building for its staff and bench marking missions in order to standardize its operations. In addition, it has sought strong and reliable networks through partnerships, linkages and collaboration with business membership associations, the private sector, government agencies, industry, research institutions and individual mentors.

It is expected that the incubates shall enhance their technical skills, business skills, and intellectual property management; establish viable networks with various industries and investors; and build successful businesses with a huge potential for employment and wealth creation that will not only grow local economies but also be up scaled to the region.

In a nutshell, the IC shall focus its resources at achieving learning excellence in improving the working environment for enhanced productivity, enhancing incubatees capacity, involvement of all stakeholders, as well as increasing the IC's visibility not only in the region but also internationally. Further, the IC shall enhance capacity of leadership while regularly monitoring and documenting its outputs. In addition the IC will develop & upgrade its ICT &, e-resources. The Incubator shall also continue creating a sustainable and a strong entrepreneur

support infrastructure besides developing an understanding of existing regional business environment and incubation ecosystem and providing access to equipment/tools/facilities and experts in product or service development. Moreover, the IC shall also attract local and international expertise, coaches and mentors to support the incubation process besides showcasing innovations as a strategy for sharing knowledge through expositions and support equity through cultivation of a spirit of inclusivity in IC utilization.



Vice Chancellor Moi University following a presentation by incubates during entrepreneurial boot camps



Mobility for Innovative Renewable Energy Technologies (MIRET) Project



Prof. Kirimi Kiriamiti (Coordinator)

Energy plays a critical role in transformation and promotion of many developing countries. The realization of Africa's development objectives is only feasible if quality energy services are availed in a sustainable, competitive, cost effective and affordable manner to all sectors of the economy ranging from manufacturing, services, mining, health, and agriculture to households. Greater access to reliable energy leads to: income generation; greater economic specialization; enjoyable leisure; substitution of labour with capital that increases productivity; creation of small businesses and enterprises; re-allocation of household time (especially by women) from energy provision to improved education; access to greater market size due to lower transportation and communication costs; and potential health improvements due to reduced indoor smoke, and improved refrigeration. However, to achieve great access to energy requires skilled manpower. Hence, the African Centre of Excellency (ACE II -PTRE) bided and won a European Union funded project: Mobility for Innovative Renewable Energy Technologies (MIRET).

The Mobility for Innovative Renewable Energy Technologies (MIRET) project focuses on student, staff and faculty mobility. It is being implemented in partnership with four (4) other African Universities countries including: Makerere University (Uganda – East African Region), University of Buea (Cameroon – Central African Region), University of Zambia (Zambia – South African Region), and University of Sfax (Tunisia – North African Region). In addition, Technische Hochschule Ingolstadt (Germany) is the EU technical partner. The overall objective of the MIRET project is to improve on the accessibility and capacity of Universities in Africa to produce highly skilled and competent postgraduates in renewable energy. Specifically the mobility project aims to; (1) Enhance accessibility to quality training for postgraduate students to address the market needs for high level skills and competence in renewable energy technologies, (2) Strengthen academic partnership between participating institutions to foster staff mentorship and enhance sharing of knowledge, innovation and dissemination of good practices in renewable energy technologies, (3) Create space for professional exchanges and experience sharing to enhance visibility, modernization and internationalization of the partner institutions, and (4) Promote harmonization and standardization of curricula in renewable energy technologies among partner institutions for recognition and African integration.



Partners in Brussel-Belgium in kick of meeting of MIRET. From left: Stefan-German, Alineitwe -Uganda, Nadim – Tunisia, Pierre-Cameroon, Kiriamiti-Kenya (project coordinator, Kiprop-Kenya (ACE, center Leader), Simate-Zambia



