

UPM SUCCESSFULLY LEADS THE 34TH UC EXECUTIVE BOARD MEETING VIRTUALLY



(L-R) Prof. Dr. Mohd Roslan Sulaiman, Vice Chancellor, Universiti Putra Malaysia (UPM) delivered the welcome remarks as co-chair of the 34th UC Executive Board Meeting. Dr. Glenn B. Gregorio, SEARCA Director, provided the opening remarks as Head of the UC Secretariat.

The Southeast Asian University Consortium for Graduate Education in Agriculture and Natural Resources (UC) virtually conducted its 34th Executive Board Meeting on 16-17 December 2021 hosted by Universiti Putra Malaysia (UPM) in Serdang, Selangor, Malaysia. The meeting was attended by representatives from its six (6) regular members, two (2) associate members, four (4) affiliate members, and its Secretariat.

The Consortium welcomed its newly appointed officials from Universitas Gadjah Mada (UGM) and Tokyo University of Agriculture (Tokyo NODAI). These are Prof. Budi Gunthoro, S.Pt., M.Sc., PhD, Dean of the Faculty of Animal Science, and Dr. Hatma Suryatmojo, S.Hut., M.Si, Head, Center of Academic Innovation and Studies, as UC Executive Officer and UC Coordinator, respectively for UGM; while for Tokyo NODAI, we have Prof. Dr. Machito Mihara and Ms. Naho Goto, Director and Chief Officer, respectively, of the Center for Global Initiatives, as UC Executive Officer and UC Coordinator.

During the meeting, the Secretariat presented the list of applicants from the member universities of the State Universities and Colleges - Association of Colleges of Agriculture in the Philippines, Inc. (SUC-ACAP) for mobility to the UC, as part of the Memorandum of Understanding (MOU) signed between the UC members and SUC-ACAP. This Mobility Program is a component of the project Leveling Up Philippine Higher Education Institutions in Agriculture, Fisheries, and Natural Resources (LevelUPHEI AFaR), funded by the Philippine Commission on Higher Education (CHED) through SEARCA and the mobility will commence in early 2022.

The UC Executive Board also agreed to submit another ERASMUS+ project proposal taking off from the successful 2016-2019 ERASMUS+ Capacity Building for Higher Education program on the Joint Master of Science in Food Security and Climate Change (MS FSCC) degree.

The meeting also planned for its activities and grants program for 2022. UC member constituents may anticipate the conduct of the 2022 UC Summer School to be hosted by Universitas Brawijaya (UB) in Malang, Indonesia in partnership with Montpellier SupAgro of France. This Summer School will be held back-to-back with the 35th UC Executive Board Meeting, with UB as host.

The 2022 Graduate Forum shall be hosted by Maejo University in Thailand while the 2022 Faculty Forum shall be organized by Central Luzon State University in the Philippines. Both events will be the first UC annual activities that these new Affiliate members shall organize.

The UC members represented in the meeting are the regular members, Institut Pertanian Bogor (IPB), Universitas Gadjah Mada (UGM), Kasetsart University (KU), University of the Philippines Los Baños (UPLB), and Universitas Brawijaya (UB); the UC Associate Members, Tokyo University of Agriculture (Tokyo NODAI) and National Taiwan University (NTU); University of British Columbia (UBC) of Canada, Maejo University in Chiang Mai, Thailand, and Visayas State University, and Central Luzon State University, both from the Philippines, as Affiliate Members; and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), the Secretariat of the UC.

NTU leads a discussion on agricultural adaptation strategies for coping with climate change during the 7th UC Graduate Forum

Read more on Page 3...



SEARCA highlights transformational leadership during its 55th anniversary through the alumni's stories

SEARCA, through the Graduate Scholarship and Institutional Development Unit (GSIDU) and the Regional SEARCA Alumni Association (RSAA), organized an Alumni Forum on Transformational Leadership on 25 November 2021. The forum celebrated SEARCA's 55th Anniversary and discussed the experiences and reflections of selected SEARCA alumni on what it takes to be a transformational leader.

Dr. Glenn B. Gregorio, SEARCA Director, welcomed everyone to the forum and thanked the alumni's continuous support for over six decades. SEARCA considers its scholars to be the seeds that were sown and are continuously bearing fruits of goodwill and higher learning as alumni. They are SEARCA's ambassadors that champion excellence in agriculture and rural development in the region. Dr. Gregorio also referred to both scholars and alumni as the powerhouse of SEARCA, especially in times of uncertainty.

Dr. Josefina T. Dizon, Professor at the College of Public Affairs and Development, University of the Philippines Los Baños (UPLB), and President of RSAA, shared the values that the alumni should emulate. She summarized these values as a new acronym for SEARCA -Strength in unity, Engagement, Adaptiveness, Resilience, Collaboration, and Acceleration. By embracing these values, both scholars and alumni can sow seeds of innovation towards agricultural transformation in Southeast Asia. Dr. Dizon also recognized SEARCA as instrumental for the alumni's achievements.

Dr. Weerapon Thongma (Thailand), Dr. Asikin Yoeu (Cambodia), and Mr. Natalino Babo Martins (Timor Leste) served as panelists for the forum and shared their leadership journey. Dr. Weerapon Thongma is an Associate Professor and the President of Maejo University in Thailand with almost 35 years of experience in leadership in the academe. Dr. Asikin Yoeu is an Undersecretary of State at the Ministry of Agriculture, Forestry and Fisheries, Cambodia. For over 11 years, Dr. Asikin continued to serve Cambodia through her leadership in the academe and the Cambodian Government, starting in 2018. Mr. Natalino Babo Martins is the Deputy Project Manager of Conservation International in Timor Leste. For nine years, Natalino has shared his expertise and leadership in various projects funded by the United States Department of Agriculture.



INSIDE THIS ISSUE:

- 1 UPM successfully leads the 34th UC Executive Board Meeting virtually
- 2 SEARCA highlights transformational leadership during its 55th anniversary through the alumni's stories
- 3 NTU leads a discussion on agricultural adaptation strategies for coping with climate change during the 7th UC Graduate Forum
- 4 Tokyo University of Agriculture organizes the 3rd UC Faculty Forum virtually
- 5 Transforming Waste into Wealth with UPM's Prof. Ir. Ts. Dr. Mohamed Thariq Bin Haji Hameed Sultan
- 6 SEARCA Regional Professorial Chair Grantee from Malaysia shares innovation on the Putra Unmanned Aerial Vehicle



(Top, L-R) Dr. Serlie Barroga-Jamias (Moderator), Dr. Weerapon Thongma (Thailand) (Bottom, L-R) Dr. Asikin Yoeu (Cambodia), and Mr. Natalino Babo Martins (Timor Leste)

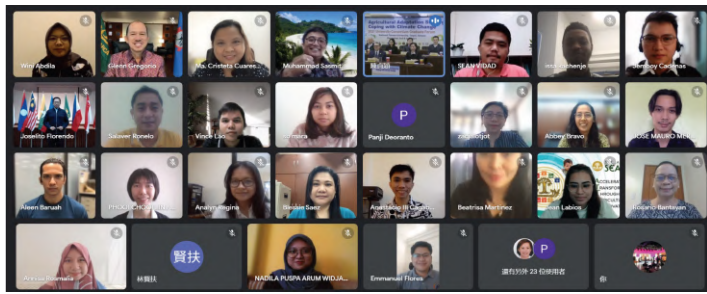
Another SEARCA scholarship alumna, Dr. Serlie Barroga-Jamias, Professor, College of Development Communication, UPLB, served as Moderator during the forum. At UPLB, she has served in administrative positions for 12 years, such as being Director of Public Relations, two times and as Vice Chancellor for Community Affairs.

The alumni's stories, values, and personal lives have become powerful testimonies during the alumni forum. Factors such as education, a supportive employment or work environment, inclusivity policies in the government, appreciation for young leaders, dedication, and the willingness to serve the country, are all part and parcel of their journey as transformational leaders in their respective fields. The panelists also highlighted the importance of having a vision, which in their case, stemmed from their humble beginnings. The turning point to their journey was when SEARCA provided an opportunity to realize their vision. The combination of their vision and the opportunity handed to them through the scholarship led them to where they are now.

The panelists highlighted that leaders can be from any gender as long as they commit, they lead by example, and they gain the people's trust. After all, leadership is about inspiring people to accomplish things that they thought they could never do. It is about seeing opportunities amidst the hardships and challenges.

Dr. Asdi Agustar of Andalas University, Indonesia, and Vice President of RSAA, closed the forum by highlighting that SEARCA plays its role by giving birth to a cadre of leaders in different fields. These leaders inspire change in those who follow, thus, ushering transformation towards regional development.

SEARCA underscores the importance of harnessing the potential to address pressing issues of poverty and food security. The forum highlighted that the alumni are SEARCA's best resources and partners, especially in areas in dire need of transformation.



NTU leads a discussion on agricultural adaptation strategies for coping with climate change during the 7th UC Graduate Forum



The 7th UC Graduate Forum included a virtual tour of the NTU Facilities as well as their affiliated institutions.

National Taiwan University (NTU) hosted the 7th UC Graduate Forum on 2-3 December 2021 with the theme, "Agricultural Adaptation Strategies for Coping with Climate Change." The event was attended by select graduate students from member universities, NTU, IPB University, Universitas Gadjah Mada (UGM), Universiti Putra Malaysia (UPM), University of the Philippines Los Baños (UPLB), Kasetsart University (KU), Universitas Brawijaya (UB), and Tokyo University of Agriculture (Tokyo NODAI). New Affiliate Members, Visayas State University (VSU), Central Luzon State University (CLSU), and Maejo University (MJU) also sent their students to join the forum, which marks their 1st activity with the UC. The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) was also in attendance as Secretariat to the consortium.

The 7th UC Graduate Forum delved into the strategies and technologies developed and implemented in agriculture to cope with climate change. The graduate students presented their research based on four sub-themes, Making Crops Resilient to Climate Change, Sustainable agricultural management: Economic and marketing strategies and implications in the era of climate change, Smart Agriculture, and Challenge and opportunities of animal products. Dr. Huu-Sheng Lur, Dean of the College of Bioresources and Agriculture of NTU, welcomed the participants as host of the two-day forum on behalf of University President Prof. Dr. Chung-Ming Kuan.

Mr. Joselito G. Florendo, Deputy Director for Administration of SEARCA, underscored the importance of agriculture as the backbone of many economies that are constantly threatened by the effects of climate change. Building adaptive strategies to cope with these threats will help build the sector's resilience towards food security and alleviating poverty. As UC Secretariat, Deputy Director Florendo reinforces SEARCA's support to strengthen agricultural adaptation strategies for coping with climate change through responsive programs and services embodied in its 11th Five Year Plan of Accelerating Transformation Through Agricultural Innovation or ATTAIN.

SEARCA Director Dr. Glenn B. Gregorio, in his Keynote Speech on having a Climate Change Ready Agriculture, highlighted the importance of sowing seeds of curiosity among the youth and re-thinking food security by supporting academe-industry-government models. Climate change in agriculture is a reality that the world contends with that needs interconnectivity among all actors, across sectors, at all levels. The youth play a vital role in achieving a transformative systemic change in the agriculture food system as they have the power to advocate for change and to hold decision-makers accountable.

The UC Graduate Forum saw 38 research studies presented by MS and PhD students. A total of 53 participants attended the virtual event. The best presentation was awarded to graduate students from UPLB, NTU, and MJU. Mr. Emmanuel C. Flores from the Department of Agribusiness Management and Entrepreneurship, College of Economics and Management, UPLB, shared his study on the Economic and Marketing Strategies for Small Island Communities in the Philippines: The Case for Sustainable Agriculture Amidst Climate Change. He discussed his observations on the value chains of copra and fish, the major export products of Jomalig and Patnanungan in the Philippines. Challenges identified include the difficulties in accessing livelihood capitals, unsustainable production practices, support services, and market systems. The study recommends the development of community-supported agriculture and agritourism, and product and market diversification, increasing farmers' income through value-added activities on traditional agricultural operations.

Ms. Marlen Trejo from the School of Renewable Energy of MjU shared her study on the development of fermentable sugars from fresh elephant ear plant weed for the manufacture of efficient bioethanol. The elephant ear plant is a potentially dangerous weed considered an invasive species. The study used it as a source of non-edible lignocellulosic biomass for bioethanol synthesis, which can be an effective feedstock plant for future bioethanol production.

Mr. Kang Wu from the Department of Animal Science and Technology of NTU presented his research on the Hepatoprotection of chicken-liver-hydrolysate based supplement (GBHP01TM) via accelerating blood alcohol clearance and antioxidant/anti-inflammatory abilities under alcoholism. His study transformed chicken livers, which are by-products of broiler slaughtering stream, into a nutraceutical ingredient through hydrolyzation. The research further discovered that the chicken-liver hydrolysate (CLH) based supplement can accelerate alcohol clearance in the body and lessen liver damage by enhancing antioxidative abilities and alcohol metabolism enzymes activities.

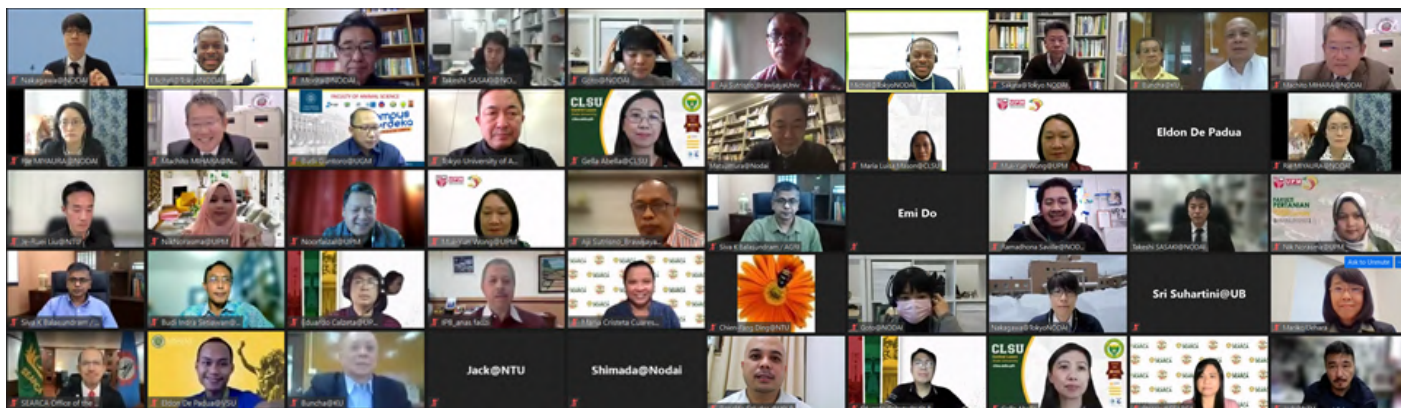
On the 2nd day of the forum, the College of Bioresources and Agriculture arranged a virtual tour of NTU's facilities such as the Phytotron, Sensory Training Classroom, Center for Intelligent Agriculture Education and Research, Intelligent Management System for Dairy Cattle under Heat Stress, Apex Agriculture Intelligence Lab (AAI Lab), and the National Taiwan University Veterinary Hospital. Besides the facilities of NTU, the virtual tour also covered in-campus affiliations such as the Miaoli District Agricultural Research and Extension Station, Council of Agriculture, and the biotech company, CH Biotech.

Associate Dean Je-Ruei Liu expressed his appreciation to both participants, session chairpersons, and UC representatives for joining the forum as without their inputs, ideas, and discussion, the event will not be successful. The forum discussed issues brought by climate change in agricultural production, livestock production, and how resource-intensive farming systems and high input may not always result in productivity but lead to massive deforestation, water scarcity, soil degradation, and high levels of greenhouse gas emission, which worsens the climate crisis. He highlighted that it is necessary to build resilience for the agricultural sector as it is tied to livelihood, human health, and food security. The forum provided a great avenue to exchange ideas and opportunities for cooperation among member universities of the UC.

Dr. Maria Cristeta N. Cuaresma, Senior Program Head of the Education and Collective Learning Department (ECLD) and UC Coordinator for SEARCA, reinforced the keynote speakers' call to transform and innovate agricultural strategies to adapt to the changing climate. She recognized the good things that have been shared and learned by the students. The UC further hopes that the participants found future collaborators during the forum and will nurture the networks they have established. The graduate forum is also a testament to the accomplishments of the participating universities.

The UCGF is an annual event that aims to provide an opportunity for graduate students from UC member institutions to share new knowledge, research ideas, and experiences in an open platform. It also encourages transdisciplinary studies and promotes greater integration of research through a strategic partnership among the UC members; and strengthens the relationship between and among the UC members. The event is also part and parcel of further strengthening the institutional ties between and among leading agricultural universities that comprise the membership of the UC towards the internationalization of higher education in the region.

Tokyo University of Agriculture organizes the 3rd UC Faculty Forum virtually



Twenty-three (23) faculty members from ten (10) institutions of the Southeast Asian University Consortium for Graduate Education in Agriculture and Natural Resources (UC) participated in the 3rd Faculty Forum with the theme "Agricultural Science for a Better World" held on 19-20 January 2022 and hosted by the Tokyo University of Agriculture (Tokyo-NODAI).

The UC Faculty Forum is an annual event that aims to provide an opportunity for faculty members from UC members to develop camaraderie, encourage transdisciplinary studies, and promote greater integration of research through strategic partnerships for collaboration. This activity is also a way to further strengthen the relationship between and among the UC members which would hopefully lead to collaborative research proposals. The activity was initially proposed by the University of the Philippines Los Baños (UPLB) in 2018 and was first held in 2019 at Los Baños, Laguna.

Due to the pandemic, the conduct of the past two Faculty Fora was done virtually with Institut Pertanian Bogor (IPB), Universitas Gadjah Mada (UGM), Universiti Putra Malaysia (UPM), UPLB, Kasetsart University (KU), Universitas Brawijaya (UB), Tokyo University of Agriculture (Tokyo NODAI), National Taiwan University (NTU) and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) in attendance. Also attending for the first time are the new affiliate members, Central Luzon State University (CLSU), Visayas State University (VSU), and Maejo University.

Dr. Glenn B. Gregorio, SEARCA Director and Head of the UC Secretariat, recognized the timeliness of the forum's theme as science-based solutions are greatly needed this time of the pandemic and as the whole world ushers in the new normal. The situation has also brought agricultural education to the forefront and the UC is stepping up and stepping out to push for continuously coping with the changing landscape of agriculture in the region.

Prof. Dr. Shigenori Morita, Department of Agricultural Innovation for Sustainability, Faculty of Agriculture, Tokyo-NODAI delivered his plenary session on Sustainability, Resilience, and Well-being as the final goals of Agricultural Sciences. Prof. Dr. Morita highlighted sustainability, resilience, and well-being to address the dilemma of food, environment, and energy/resources issues while taking into account the growing population. He underscored the interconnectivity of the three where sustainability on its own may not be enough and it should be combined with the concepts of resilience and well-being towards developing a better world.

The Faculty Forum held four sessions spread out during the two-day event. Session 1 was on Agroecology, Food Production, and Sovereignty in Asia. Discussions on this session centered on precision agriculture to improve food production and support food sovereignty, food development for disaster resilience, dairy farming in Thailand, development of conservation agriculture in disaster-prone upland communities in the Philippines, agricultural cooperatives, and the development of sustainable agriculture and agro-industry in Indonesia through bio-refining of coal ash.

Session 2 was all about Land and Water Management for Sustainable Rural Development in Asia. The panelists talked about the impact of natural disturbances on eco-hydrological processes in a mountainous watershed, models of evapotranspirative irrigation, management of rice root nematodes by conservation agriculture, subsurface porous pipe irrigation for Northern Thailand, fall cone and percussion methods in determining the liquid limit of clayey soils, as well as flood risk analysis in the Philippines.

On the second day of the Faculty Forum, Session 3 tackled the Application of Biotechnology for Sustainable Agriculture in Asia. It included a dialogue on the characterization of ribosome-inactivating protein (RIP) of oil palm for sustainable crop protection against basal stem rot, improvement of legume production through inoculation with indigenous rhizobia, bioinformatics approaches to utilize Indonesia's biodiversity, and advancements in organic agriculture.

Session 4 covered Applying UAVs, Satellite, Sensor, and LPWA for Rural Development in Asia. This last session included a discussion on the use of UAV multispectral imaging for precision agriculture, terahertz sensing technology in agriculture, agricultural mechanization technologies for rice production, UAVs and sensors for rural development in Malaysia, weed detection using Multispectral Aerial Derived from Multirotor Unmanned Aerial Vehicle, and low-cost smart technologies application for rural development in Asia.



The Faculty Forum ended with Prof. Mariko Uehara, Vice-President of Tokyo NODAI, congratulating and thanking the participants for the successful two-day event. The 4th UC Faculty Forum in late 2022 will be held at Central Luzon State University in the Philippines



Transforming Waste into Wealth with UPM's Prof. Ir. Ts. Dr. Mohamed Thariq Bin Haji Hameed Sultan

Prof. Ir. Ts. Dr. Mohamed Thariq Bin Haji Hameed Sultan on inventing drones From Pineapple Leaves. | Photo: UPM Researchers Invented Drones From Pineapple Leaves, 2020, <https://bit.ly/3y6m0it>

Prof. Ir. Ts. Dr. Mohamed Thariq Bin Haji Hameed Sultan is a Professor at the Department of Aerospace Engineering, Universiti Putra Malaysia (UPM), and currently the Director of UPM Press. He was awarded a SEARCA Regional Professorial Chair Grant for AY 2021-2022 in recognition of his contributions to agricultural technology and innovation and is UPM's 10th awardee of the grant since its inception in 2012-2013.

Technology and innovation have been Prof. Ir. Ts. Dr. M.T.H. Sultan's expertise since he started his career. He is a Professional Engineer registered under the Board of Engineers Malaysia (BEM), a Professional Technologist (PTech) under the Malaysian Board of Technologists, and a Chartered Engineer (CEng) with the Institution of Mechanical Engineers United Kingdom. Upon graduating with his Bachelor's degree in Mechanical Engineering at Universiti Tun Hussein Onn Malaysia, he started working for a consulting company to gain experience in the field, management, and design. His background in technology and innovation also includes working in many industries such as AIRBUS, Malaysian Airlines Berhad, and Tan Choong Motors.

Prof. Ir. Ts. Dr. M.T.H. Sultan pursued his graduate studies with an MSc in Aerospace Engineering at UPM and then his PhD in Mechanical Engineering at the University of Sheffield, United Kingdom. He then entered UPM to share his knowledge and experiences with the next generation of inventors and innovators. Before his post as Director of UPM Press, Prof. Ir. Ts. Dr. M.T.H. Sultan was also the Director of Aerospace Manufacturing Research Centre (AMRC) and the Head of the Laboratory of Biocomposite Technology (BIOCOMPOSITE), Institute of Tropical Forestry and Forest Product (INTROP) at the university. He was also the main reference officer for the collaboration between UPM and Proton, a Malaysian automotive company.

Prof. Ir. Ts. Dr. M.T.H. Sultan's research interests include Hybrid Composites, Advance Materials, Structural Health Monitoring, and Impact Studies. Because of his contributions in innovation and technology, he was also appointed as an International Lead Consultant for Experimental & Computational Analysis of Composite Structures by Aerospace Research Centre (ARC) Sudan and was involved in multi-million research projects locally and internationally.

Prof. Ir. Ts. Dr. M.T.H. Sultan's research has produced more than 260 International journal papers and 15 books. Through the years of working in the academic field and teaching both undergraduate and post-graduate students, he believes that his attitude, skills, and knowledge have developed because of the diversity of his teaching environment, which provides both fulfillment and challenges along the way. Ultimately, he sees all these experiences as something that contributed greatly to his professionalism.

For over 16 years of teaching and research, Prof. Ir. Ts. Dr. M.T.H. Sultan considers his work on transforming agricultural waste into wealth as his greatest contribution to society. An example of this is his research on turning pineapple leaves into fibers to develop a technology that will uplift farmers' socio-economic status. Testament to his relentless pursuit for innovation, he was awarded with the Leaders in Innovation Fellowship (LIF) by the Royal Academy of Engineering (RAENG), United Kingdom (UK), and recognized as Top Research Scientist Malaysia (TRSM) by Akademi Sains Malaysia (ASM). Prof. Ir. Ts. Dr. M.T.H. Sultan also holds various patents for his innovations such as the rotating blade for natural fiber extraction machine, and Techno-Economic Hard Body Armour, among others.



Prof. Ir. Ts. Dr. Mohamed Thariq Bin Haji Hameed Sultan as featured on KiniTV | Photo: https://www.youtube.com/watch?v=6fayXKNYfCk&ab_channel=KiniTV

Prof. Ir. Ts. Dr. M.T.H. Sultan advises the youth to be observant and to recognize problems that our society faces. More than just recognizing the problem, the youth should also try to find solutions and share their knowledge towards the greater good.

Prof. Ir. Ts. Dr. M.T.H. Sultan encourages everyone to become problem solvers instead of problem creators. He hopes to develop a policy that will support the processing of agricultural waste by transforming it into useful technology. His public lecture on "Putra Unmanned Aerial Vehicle: From Agricultural Biomass to a Biocomposite Flying Drone" discusses the innovative ways to process agricultural waste.

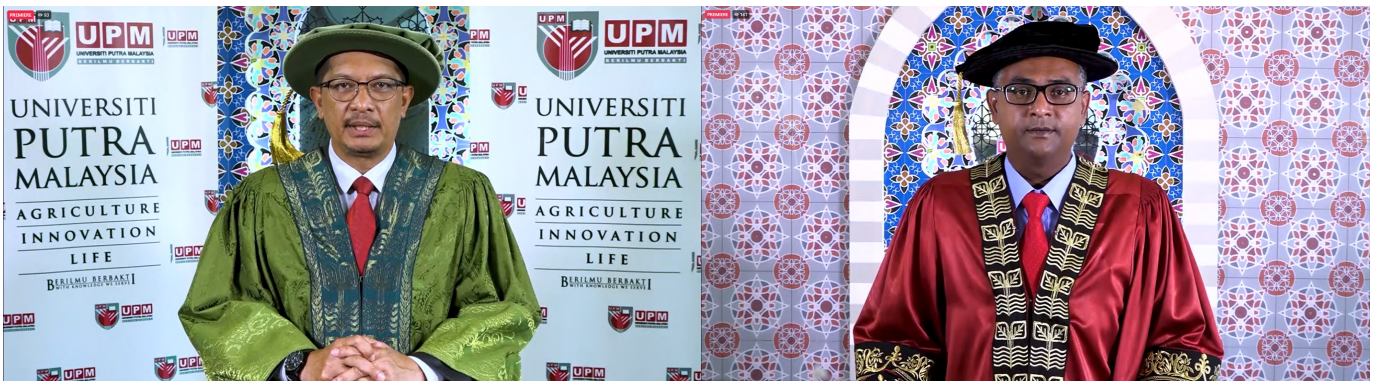
The Unmanned Aerial Vehicle, Industrial Design is one of the many patents that Prof. Ir. Ts. Dr. M.T.H. Sultan holds. His work on a drone made of pineapple leaves is part of a sustainability project at UPM, which started in 2017. The discarded pineapple leaves are used to create the skeleton of the drone. By using natural materials or biocomposites, Prof. Ir. Ts. Dr. M.T.H. Sultan's team developed a durable, lighter, and cheaper drone that can go as high as a thousand meters and stay in flight for 20 minutes.

Such innovation in agriculture helps farmers as it provides additional income for them, and it also lessens the environmental impact of processing agricultural wastes. Pineapple wastes are usually discarded or burned by the farmers which can lead to pollution. The project aims to encourage scientists in Malaysia to put agricultural waste to good use and help farmers increase their yield. The next phase of the project is to develop a larger drone that could carry a payload for sensors that would benefit farmers and make their tasks lighter.

SEARCA Regional Professorial Chair Grantee from Malaysia shares innovation on the Putra Unmanned Aerial Vehicle

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SEARCA Regional Professorial Chair Grantee from Malaysia shares innovation on the Putra Unmanned Aerial Vehicle



(L-R) Professor Dr. Mohd Roslan bin Sulaiman, Vice Chancellor of UPM, and Prof. Ir. Ts. Dr. Mohamed Thariq Bin Haji Hameed Sultan, Professor at the Department of Aerospace Engineering and Director of UPM Press during the Regional Professorial Chair Grant Public Lecture.

Prof. Ir. Ts. Dr. Mohamed Thariq Bin Haji Hameed Sultan conducted a public lecture on "Putra Unmanned Aerial Vehicle: From Agricultural Biomass to a Biocomposite Flying Drone" on 10 December 2021. The lecture was part of the SEARCA Regional Professorial Chair Grant awarded to him for AY 2021-2022 and was streamed online through UPM's social media pages.

Prof. Ir. Ts. Dr. M.T.H. Sultan discussed biomass, agricultural biomass, and natural fibers. Plant fibers are biodegradable, have a high strength-to-weight ratio, reduce greenhouse effects, are environmentally friendly, reduce waste, are ideal for mechanical and thermal stability, are cost-effective, and are produced from sustainable products. Plants where fibers can come from include flax, kenaf, Napier, sisal, bamboo, jute, and oil palm. Natural fibers can also be used for various applications such as for boats, car door panels and bumpers, and food packaging.

In 2017, he was approached for a community project to address the pineapple waste disposal of farmers as discarded pineapple wastes can become nests for poisonous animals such as snakes. It can also lead to pollution when burned. This led to a sustainability project at UPM which includes building a drone made from pineapple leaf fibers.

For the project, the fiber from the discarded pineapple leaves was processed to develop the drone's skeleton. Extracting the fiber from the plant is also convenient through a mechanism with more contact surface between the blade and the fiber. The process results in finer fibers that do not need combing after extraction. The mechanism was also developed with reduced fabrication and was designed to be low maintenance. After extraction, the fibers are dried before they can be used.

Prof. Ir. Ts. Dr. M.T.H. Sultan's team developed a durable, lighter, and cheaper drone as they used natural materials or bio-composites. The drone could go up to a thousand meters and stay in flight for 20 minutes. Once damaged, the frame will degrade in two weeks, unlike with drone skeletons made of plastic, carbon, or aluminum fibers, which are also expensive.

Another advantage of using bio-composites for the drone is its poor electrical conductivity which prevents short circuits. The project also encourages scientists in Malaysia to put agricultural waste to good use and help farmers increase their yield.

Prof. Ir. Ts. Dr. M.T.H. Sultan's drone innovation was recognized with gold medals from various competitions such as the 8th International, Invention & Design Competition (INDES 2019), the Research Innovation & Enterprise Center (2019) Innovation Technology Expo (InTEX19), the 2nd Digitalized International Invention, Innovation and Design Johor 2019 (DIID Johor 2019), and the UTeMEX2019 Innovation Carnival. The innovation likewise won during the Research and Development competition at the Selangor R&D and Innovation Expo 2019.

Besides the SEARCA Regional Professorial Chair Grant, Prof. Ir. Ts. Dr. M.T.H. Sultan was also a resource person during the Mentorship Program for Advanced Grants Mentoring Workshop organized by SEARCA and the Sweden-based International Foundation for Science (IFS). He mentored the participants on qualitative and quantitative research approaches, the importance of the data collection process, modeling, and analysis in conducting successful research.



Mechanism used to extract the fiber from the pineapple leaves.



The Putra Unmanned Aerial Vehicle Bio-composite Flying Drone made from pineapple leaf fibers.

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