



Department of Science and Technology

6th National Research and Development Conference

"Pananaliksik at Pagpapaunlad: Daan Tungo sa Pagbabago"
Road to Recovery through R&D

November 10 and 17, 2021



About the Conference

6th National Research and Development Conference (6th NRDC)

Theme: Pananaliksik at Pagpapaunlad: Daan Tungo sa Pagbabago
Road to Recovery through R&D

November 2021

The Department of Science and Technology (DOST), in compliance with Section 19 of Article IX of the Republic Act 10055, otherwise known as the Philippine Technology Transfer Act of 2009, calls a regular national conference of all government funding agencies (GFAs) and research and development institutes (RDIs) to: a) promote a multi-disciplinary, joint, and cross collaboration in R&D; b) coordinate and rationalize the R&D agenda; and c) harmonize all R&D agenda and priorities.

Also, in Section 31 of the general provisions of the 2021 National Expenditure Program, the DOST in coordination with government research institutions and other agencies shall facilitate dissemination of all outputs of programs and projects under the Harmonized National R&D Agenda (HNRDA) to appropriate government agencies, LGUS, academe, industry and communities, whenever applicable.

Since 2016, the NRDC encouraged coordination and collaboration among industry members, academic institutions, and research and development institutions (RDIs). The event presents ongoing and completed R&D projects and programs, aligned to the priorities identified in the Harmonized National Research and Development Agenda (HNRDA) that will be useful or benefit the society and/or contribute to economic development.

For the 6th National Research and Development Conference (NRDC), the virtual event, titled "Pananaliksik at Pagpapaunlad: Daan Tungo sa Pagbangon (Road to Recovery through R&D)," will showcase programs and technologies in support of the government's whole-of-nation approach to recovery from the pandemic.

The event is organized in partnership with innovation movers in government, namely: the Department of Trade and Industry (DTI), Department of Information and Communications Technology (DICT), Department of Health (DOH), Department of National Defense (DND), Department of Agriculture (DA), Department of Energy (DOE), Department of Environment and Natural Resources (DENR), Department of Public Works and Highways (DPWH), Department of Education (DepEd), and Commission on Higher Education (CHED). It will be conducted on the 10th and 17th of November 2021 via online live streaming. For those who missed the event, you can watch the NRDC in the archive found at <https://nrdc.dost.gov.ph>.

Message



Fortunato T. de la Peña
Secretary
Department of Science and Technology
(DOST)

Five years ago, the DOST prepared the Harmonized National R&D Agenda (HNRDA) for 2017–2022 in cooperation with other government agencies, research and development institutions, and partners from the academe and industry sectors. We believe that because of our commitment as a nation to unify our efforts, the country is more than equipped and is in a better position to make scientific and technological innovations today than we were 10 or more years ago.

The Philippine Technology Transfer Act of 2009 mandates the DOST to call for a regular National Research and Development Conference (NRDC) of all government funding agencies (GFAs) and research and development institutes (RDIs). We believe that this provision is very advantageous to all sectors engaged in R&D. The DOST has been seeing to it that indeed the various R&D project implementers are being given an opportunity to bring out their best. Furthermore, we ensure that the results of completed projects are widely disseminated for the benefit of the sectors and people for whom the R&D projects were developed.

When COVID-19 hit, it was undeniable that innovation would play an essential role if we were to survive or even thrive. The pandemic took a heavy toll on our country, not only the health sector but also our industries, particularly the small and medium enterprises, the transportation sector and even education, among others. We needed solutions - not only for our medical concerns but for all other sectors as well.

As you read through these pages, you will see the ingenuity of Filipino researchers, scientists, and engineers who are fighting at the forefront of our battle against the pandemic. In this year's NRDC, we highlight R&D projects, programs, and technologies, which were supported by various National Government Agencies and that contribute to the 4Ks (Kalusagan, Kabuhayan, Kaayusan at Kinabukasan)—the government's whole-of-nation approach towards recovery amidst the COVID-19 pandemic—under the theme "Pananaliksik at Pagpapaunlad: Daan Tungo sa Pagbangon" or "Road to Recovery Through R&D."

While these recent years have been challenging, we are confident that as we continue to foster an enabling environment for R&D and as we continue to unite our efforts in advancing Science, Technology and Innovation, we will eventually overcome not only Covid-19 but also many of humanity's problems such as hunger, poverty, and inequality.

To our partners in the government, and in the public and private spheres, thank you for your commitment in fostering a research & development ecosystem geared towards the sustained growth and development of our country.

To the researchers and our partners in the academe, we commend you for thriving amidst these challenging times.

To our friends in the media, thank you for partnering with us to ensure that advancements in Science and Technology reach the Filipino People. I implore you to keep going the extra mile

to bring Science, Technology and Innovation closer to where and to whom it would matter most.

Together, let us keep working towards a better and safer future through R&D that makes change happen.

Thank you and welcome to the 6th National R&D Conference.



Mabuhay tayong lahat!





Message



Roy A. Cimatu
Secretary
Department of Environment
and Natural Resources (DENR)

DENR is pleased to join the DOST, other government agencies, and our country's scientific community in the 6th NRDC.

The theme of this year's Conference—Road to Recovery through R&D—underscores the crucial role that R&D plays in our country's recovery not just from COVID-19 pandemic, but also from other ills, like pollution and poverty.

DENR has been working towards improving the quality of our land, water, and air, and the sustainability of our natural resources. For this Conference, we are showcasing technologies that will enhance livelihoods through the planting of ornamental bamboos, encouraging public and private initiatives to develop plastic-free materials, and exploring more efficient ways to propagate economically important plants like gugo (*Entada phaseikaudes* K. Meer).

Innovation is now becoming a pillar of our economy. In its recently-released 2021 Global Innovation Index, the World Intellectual Property Organization (WIPO) cited the Philippines as one of the five middle-income economies that "are changing the innovation landscape," the four others being China, Turkey, Vietnam, and India. WIPO noted that the Philippines, over the past decade, has improved its ranking from 91st to 51st among 132 economies and was an "innovation achiever" for three straight years, from 2019 to 2021.

Going forward, let us make use of this momentum to accelerate our recovery, strengthen resilience, and achieve sustainable development.

Mabuhay!



Message



Francisco T. Duque III
Secretary
Department of Health (DOH)

Secretary Fortunato T. de La Peña of DOST, our esteemed colleagues in the various field of science, research and development, our partners in other government agencies and the private sector and to all for sharing their time with us. A pleasant day to all!

Truly, I am honored to be with you in the 6th National Research and Development Conference to share insights on the intervention efforts against COVID-19, especially as they relate to the vital interface of research and policy. Upon the onset of the COVID-19 pandemic, the Department of Health immediately activated the systems approach to the response and management of the pandemic. To promote the seamless implementation of COVID-19 interventions across all levels of government, the DOH focused its planning policy development, legislative advocacies and research to address COVID-19 concerns swiftly. Firstly, with respect to the financial realities of the health sectors, the Department's operational and strategic planning included ensuring the availability and augmentation of the budget to amply support universal health care implementation alongside delivering COVID-19 priorities.

The 2021 UH budget aims to bridge the gap in the health system's fiscal space to amply adapt to the public health crisis and its transition to the new normal. For this year, a total of PhP166.52 B have been allotted for the implementation of the UHC Act and health system resiliency and by 2022, it is expected to increase by 80% to an estimated PhP343 B. Corollary to this increasing budget is the intensified coordination and collaboration with DOH units in the review of their plans and budget proposals to ensure alignment and appropriate prioritization of investments in this time of pandemic.

Of course, the responsible and transparent administration of this budget requires the placement and guidance of strong policies as well as the improvement of policy processes. Towards this, we established the COVID-19 policy tracker which provides an easily accessible monitoring dashboard for all pandemic-response related policies issued and posted in the DOH administrative issuance system billboard. The policy tracker was deemed vital especially because of the urgency of the response needed to be driven by the appropriate urgency in policy development. Breakthrough policies such as the implementing rules and regulations of Republic Act 11469 or the Bayanihan to Heal as One Act significantly aided and expedited the development of necessary policies. Other aspects were also guided by appropriate policies such as the DOH NTF Joint Administrative Order 2021-0001 which established the IRR of Republic Act 11525 and paved the way for the National Vaccination Campaign to fight COVID-19. In addition to these policies, the DOH also ensures its stance to support COVID-19 concerns as undertaken by the Department's Legislative Liaison Arm. This contributed significantly to the success of critical legislative measures to combat COVID-19 such as Bayanihan-1, which declared a state of emergency and authorized emergency measures to mitigate the effect of the pandemic, Bayanihan-2, which augmented funds for COVID-19 response and recovery, and the COVID-19 Vaccination Program Act, which allowed us to embark on the next stage of our fight against the pandemic.

Still, the pandemic is not yet over, which is why the DOH continues to sustain legislative advocacies to support upcoming stages of our recovery. Developing legislation such as Bayanihan-3, which will also augment funds for the COVID-19

response, vaccination and recovery, the creation of the Philippine Centers for Disease Prevention and Control for the handling of public events of national concern and boosting of the country's public health surveillance, creation of the Virology Institute of the Philippines under DOST for focused virological research and diagnostics, therapeutic tools and relevant scientific innovations, and finally, the National Health Security Act, a law which shall strengthen the implementation of international health regulations in the country. This developing legislation will not only guide our way out of the pandemic but also put the necessary reforms in place to strengthen and prepare our health systems for any coming health crisis of any scale.

Throughout all these, the DOH reinforced political engagements through close collaboration between the DOH and the legislative branch by accommodating requests in aid of legislation and requests for constituency support and the conduct of information sessions focused on updating legislators as well as national and local organizations of laws and policies related to COVID-19.

As for our national vaccination campaign, part of our efforts to ensure maximum benefits for all Filipinos is the provision of technical assistance to local chief executives for the COVID-19 vaccination and deployment program. This covered activities such as the conduct of orientation activities on the COVID-19 vaccination and deployment program to the local chief executives of Pangasinan and close coordination with the district representatives of Regions I, II, CAR and National Capital Region in the implementation of PDITR strategy. Coupled with these were the partnerships we sought with the Philippine Congress, local government units, the private sector for the conduct of webinars and townhalls on COVID-19 vaccination program, which were part of the intensified information campaign to boost vaccine confidence.

However, though governance allows us to deliver excellent public health, it is research that truly pushes public health forward. Recognizing this and in response to the needs of the pandemic, the DOH has relentlessly expanded its coverage and platforms for research to catalyze the generation, consolidation and monitoring of timely, accurate, and scientifically sound information on COVID-19. Innovations in this area have resulted in the creation of two data portals to capture the fast-evolving evidence of SARS-COV 2. We have the DOH COVID-19 local evidence database which harmonizes local evidence generation on COVID-19 by consolidating research at various stages, calls for proposals and other relevant technical papers. This aids in the dissemination of information and reduces the potential duplication of efforts. On the other hand, the DOH COVID-19 meta-summaries are intended to provide summarized evidence on reviews related to COVID-19 with the preference for rapid reviews developed by local institutions or groups with expertise in evidence-based medicine and by internationally-recognized international groups such as the Cochrane collaboration.

Ongoing studies on COVID-19 are currently being funded by the DOH, advancing health through evidence-assisted decision programs. As professionals both in science and medicine, we must continue pushing the envelope using the technologies, methodologies and growing knowledge available to us to spur the generation of more local evidence for policy development and to promote informed, scientifically sound decision-making on public health measures.

As the lead technical agency in public health, the DOH formed the Steering Committee for the conduct of clinical trials for investigational treatments for COVID-19 to provide overall national level supervision and technical guidance in the conduct of critical studies for potential treatment for COVID-19. Beyond the technical guidance, the Steering Committee shall also ensure that decision making is indeed supported by evidence while at the same time, exercising oversight in multi-country clinical trials such as the Avigan and Solidarity trials. Aside from the appropriate scientific rigor, these measures seek to ensure proper quality assurance as well as checking compliance to regulatory and data safety of requirements of clinical trials conducted locally. In relation to this, the DOH Single-Joint Research Ethics Review Board has been designated by the Philippine vaccine expert panel as the central ethics committee to facilitate ethics review of vaccine clinical trials and COVID-19 studies to be implemented in the country. This body strictly ensures the compliance of clinical trials and all other forms of research undertakings in COVID-19 with all relevant ethical principles and standards.

The synergy of research policy and legislation is what will push the state of Philippine public health forward. The DOH continues moving on all these fronts because science, especially science for medicine, should never be practiced without ethics. It is only through equal measures can science and ethics produce genuine benefits for humanity.

As we all share our vision and path to realize a better tomorrow for the country, let us always keep in mind our shared goal and responsibility to create better lives for everyone.

Maraming salamat at mabuhay tayong lahat!

Message



Ramon M. Lopez
Secretary

Department of Trade and Industry (DTI)

It is a pleasure to be here virtually at the 6th NRDC organized by our partners in DOST. This year, as you feature programs, projects and technologies that contribute to the 4Ks, namely: Kalusugan, Kabuhayan, Kaayusan at Kinabukasan, allow me to thank Sec. Fortunato de la Peña for giving us the privilege of discussing the government's ongoing efforts to sustain the livelihood of our countrymen, and ensure the recovery of our industries amidst the challenges of the pandemic.

Through the concerted efforts of the government and the private sector, we have made significant improvements in the recovery of our economy, and can now look into how we can further rise above the challenges of the pandemic. For our part, the Department of Trade and Industry has been implementing policies and initiatives since last year that would help our nation get back on its feet. We have continuously proposed reopening of the economic sectors even at high quarantine levels, so that we can bring back more jobs, livelihood, and income opportunities.

Even at high alert levels, we have pushed for the 100% operating capacity for major sectors like the electronics and the IT-BPM, and have encouraged alternative working arrangements such as work from home set-up, which may be a continuing part of the new normal. These policies and initiatives aim to not only sustain our economic recovery, but also empower the private sector to adjust and recover, so that they can seize opportunities from the changing domestic and global demands.

To sustain this momentum, DTI's recovery efforts are hinged on two strategies. First is Recharge PH. The national recovery program for a balanced and whole of society approach to restart and revitalize the economy amid the COVID-19 pandemic. As the lead of the task group to oversee economic recovery, DTI has also been implementing the Rebuild PH strategy, or revitalizing businesses, investments, livelihoods and domestic demand, to alleviate the economic impact of the pandemic while ensuring that businesses do not merely survive but remain to be competitive in the global market. Our broad strategies under Rebuild PH include revitalizing the demand of households and businesses boosted by government spending and empowering local industries to capture that demand.

Anchored on this whole of society approach, this in turn will create a virtuous cycle of sustained and growing economic activity with strong domestic linkages. To ensure that local industries keep operating, as well as to improve their competitiveness, the DTI as part of the economic team, continues to pursue the implementation of key economic policies and reforms. We now have the Corporate Recovery and Tax Incentives for Enterprises or CREATE Act, that basically lower the corporate income tax rates from 30% to 25%, and further down to 20% for SMEs. This makes our tax rates competitive in the Asian region. The CREATE Act has also enhanced the investment incentives, giving longer periods of incentives like tax holidays for high technology and R&D oriented activities. For example, we provide incentives to priority industries for the improvement of physical as well as digital infrastructures, technology based agriculture, manufacturing, and energy projects, and we encourage innovation and commercialization of new technologies, and locally generated intellectual properties.

We likewise advocated for a stronger local preference mechanism in the government procurement through the inclusion of a provision in the Bayanihan 2, and for the

passage of the Pandemic Protection Act, so we can support our domestic industries and suppliers. With the government buying Filipino made goods, we are able to create more jobs in the country, and invest in the collective advancement of our Kababayans.

DTI continues also its efforts to strengthen the country's linkages at the multilateral, regional and bilateral levels. Through free trade agreements, we are able to expand the market of our industries, as well as their supply or value chain base. Just last month, we announced the substantive conclusion of negotiations of the Philippines-Korea FTA. We are also working on securing the concurrence of the Senate for their Regional Comprehensive Economic Partnership (RCEP) Agreement. That's composed of the 10 ASEAN countries plus 5 FTA Partners of ASEAN. You know, being part of an FTA not only improves market access, but it is a big attraction as well for foreign investors to locate in our country and have access to the markets of those participating in the FTA.

Our initiative together with DOST and DOH to build the capability of the local industry to produce vaccines, to address current and future health emergencies and pandemics, is currently being worked out. In fact, if conditions permit, vaccine manufacturing operations, even including pharmaceuticals, may start as early as the second or third quarter of 2022.

With the roll-out of the government's vaccination program, this will provide more mobility, confidence and relief to our businesses and consumers alike. Complemented by the shift of more provinces and cities to the alert level system, this further intensifies our move towards a more unified, calibrated and safe reopening of the economy, thus bringing back more consumption and economic activities. With higher vaccination rates and new pharmaceutical treatments, we can expect a more sustained pace towards economic recovery. While the Philippines is already displaying signs of recovery, there is still much to be done. Until we are able to temper covid-19 from a pandemic into an epidemic, and go full blast on our economic recovery efforts, we continue to take a proactive approach to manage the risks, not just avoid them. That is why even as we sustain our momentum, Pres. Rodrigo Roa Duterte has already directed us to boost our all out support for the business sector to help in its rehabilitation, so that they can become stronger and more resilient in the post pandemic future.

We remain confident that through a whole of society approach, we will soon be able to build a better Philippines where all our people can achieve a more comfortable and greater quality of life. In line with the theme of this year's conference, "Pananaliksik at Pagpapaunlad: Daan Tungo sa Pagbangon", allow me again to recognize our host agency, DOST. Thank you, Sec. Boy, as well as our partner agencies, DENR, Sec. Cimat, CHED, DA, DICT, DOH, DND, DoTR, and DPWH for the opportunity to coordinate and collaborate and push forward initiatives for research, development and innovation.

Maraming salamat po at mabuhay tayong lahat!

Message



Delfin N. Lorenzana

Secretary

Department of National Defense (DND)

On behalf of the Defense Team, I thank and congratulate DOST led by Sec. Fortunato T. de la Peña, National and Local Government Representatives, Members of the Academe, and Delegates from the Research and Development Communities, for initiating and sustaining this annual NRDC.

Now on its 6th iteration, its theme "Pananaliksik at Pagpapaunlad: Daan Tungo sa Pagbangon" is well appreciated for its timeliness and relevance at reporting premium on innovative thinking and sustaining knowledge not only as a way out towards a post pandemic scenario but to establish the crucial role of Science and Technology to the progress of the Nation. The Defense Department as a whole, and the AFP, stands to benefit from the fruits of these researches. A case in point are protective equipment for soldiers. We spend enormous sums of money buying helmets and vests from abroad that according to some local experts, we can easily manufacture from indigenous materials. The range of products that we can develop by collaborating are many, not only to save the lives of soldiers but the benefit we bring for the people. To this end, I would direct the AFP to work closely with the DOST to research on products and technologies that would benefit not only the AFP but eventually the Filipino people.

Again, congratulations to Secretary de la Peña for initiating and sustaining this annual conference. The DND look forward to a long and productive collaboration!

Message



Leonor Magtolis Briones
Secretary
Department of Education (DepEd)

Good day, fellow front liners in the field of education of research and development. Of all agencies in the national government which are involved in development and also the forefront in the fight against COVID, DOST is perhaps the closest and the friendliest among all the agencies that we deal with. This is because our respective mandates and functions are closely interrelated. We congratulate you for this initiative in hosting the 6th NRDC with the theme, "Pananaliksik at Pagpapaunlad: Daan Tungo sa Pagbangon or the Road to Recovery through Research & Development."

We are aware that as DOST forges on with research, technology, new institutions, new findings and ways of fighting the challenges that we are facing of this time, they need the support and backup manpower which basic education in math, sciences and even the humanities can provide. In the cabinet and also in our relationship with the President, no proposal of DOST has ever been challenged or debated because all of us see the importance of what you are doing, what you are initiating, not only for the present challenges but also for the future of our country and also of our planet.

When the DOST announced, for example, the establishment of a Brain Center followed very closely by the announcement of the launching of a Space Center as well as now the Center for Virology and we also have the Genome Centers which are also based in the University of the Philippines, I have always challenged the DepEd family that we have to move along and support the DOST and all other institutions which are researching and developing ways of dealing with current and future challenges. I always tell the DepEd family that even as DOST will get the hotshot scientists the best researchers, the best PhD's and so on, they would be needing research assistants, they would be needing data gatherers, they would be needing inputters of information into the vast research involvements and adventures. So, we have to catch up specially in enriching and expanding the reach of mathematics, science as well as the humanities. Because as I said, we can get hotshot scientist and researchers from various parts of the world, ask them to come home but they need research assistants, they need data gatherers, who will understand what the researchers, what the front liners, what those in the frontline of research are looking for. For that, we at the Department of Education have to strengthen our basic programs in mathematics, in science and technology, and the humanities because after all we are not in the business of producing robots but perhaps in nurturing and teaching better and more productive human beings.

So, congratulations DOST led by Boy de la Peña and all your scientist, all your researchers. We hope that our programs in the DepEd specially in basic science, mathematics and technology, environment and so on, will keep pace with what you are doing. That way we can provide learners, we can provide assistance, we can provide helpers and, as I always joke even janitors will understand which pieces of paper, which lines of findings should be thrown away or perhaps retained and studied further. So, congratulations to each and everyone of you. We can assure you that as far as we can, as much as we can, the Department of Education will strive to keep pace with your initiatives by providing you with learners who will be better trained, better exposed and better practitioners of the basics of mathematics, and science



and technology. Even as we continually remind them that they are Filipinos, that they have a culture. They have the heritage to protect through science and technology.

Congratulations for all your efforts. We also appreciate all that DOST has been offering to DepEd to help improve its programs, to increase the capacity of our teachers and this is a need which we recognize and accept. We thank you for the scholarships, for the special training and for the appreciation that have always been extended to us. Whenever possible, the DepEd will extend its help and assist the Department of Science and Technology in its frontline pioneering endeavors.

Congratulations once more, we assure you of our full cooperation. We assure you that if you give us feedback, it will be used where we can better improve our services, where we can also improve the capacities of our teachers as well as our students, where we can enrich our curricula and even perhaps the design of our classrooms and the major decisions that we have to make. Because after all, those who finished to survive basic education will move on hopefully to your department and help out in the solution, the search, the innovation that all of us are involved in as we fight our enemies, as we fight those who challenge us, as we fight the viruses, as we deal with the weather and as we look forward to the future and how better we can serve our country.

Thank you very much and congratulations!

Message



Rowena Cristina L. Guevara
Undersecretary for Research
and Development (R&D)
DOST

The collective effort of government agencies, academic institutions, the industry sector, and civil society organizations answers the call to change the Philippine Innovation Landscape. We have crafted the Philippine National Innovation Strategy which we call Filipinnovation—a national strategy that supports and promotes development, transfer, and commercialization of new Filipino technologies and innovations.

The pandemic brought out the inherent quality of many Filipinos to be an efficient innovator. We are happy to present in the 6th National Research and Development Conference (NRDC) our country's science, technology, and innovation undertakings that have reached greater heights and provided significant changes.

With the theme, Road to Recovery through R&D, this souvenir program showcases the technologies that every Filipino can be proud of. With the breakthroughs in specific areas in agriculture, health, industry and emerging technologies to enhancing systemic capabilities, we pin our hopes that the NRDC would be an inspiration to all and likewise be an eye-opener that R&D is a key for in achieving growth and prosperity—that R&D makes change happen!

Welcome to the 6th NRDC and congratulations to all our scientists and researchers for ensuring that science is for the people and continuously creating a better Philippines!



Message



Jaime C. Montoya

Executive Director

DOST-Philippine Council for Health
Research and Development (PCHRD)

On behalf of PCHRD, I would like to extend my congratulations to the organizers of the 6th NRDC. The previous year was filled with challenges, but this year, as we have attuned ourselves with conducting our programs and activities through online platforms, we have proven that coordination and cooperation are still possible, even enhanced as we were opened to even more possibilities.

In the health sector, especially, the challenge in 2020 was to come up with immediate solutions to mitigate the spread of the virus. The pandemic did prove a great hurdle to overcome, but we still persistently sought different avenues, even beat new paths towards achieving the goals for the Harmonized National Research and Development Agenda (HNRDA) we set in 2017. The Council was able to support functional food research, such as Dr. Angeles-Agdeppa's VCO study, which will assure readily available COVID-19 adjunct therapy product to the common folk, and our recent partnership with the UP – Manila SIBOL Task Force found an additional purpose for technologies like the RxBox.

Indeed, as we slowly learn to live in the new normal that COVID-19 is shaping, we are given the opportunity to see the future in a light we did not imagine four years ago and be more prepared for eventualities, may they be good or bad.

Moving forward, it is our task to think beyond stop-gaps and come up with more permanent yet adaptable solutions, ones that acknowledge that the virus exists and will persist even after it has been controlled and treatments have been found. It is also our task to arm ourselves and the country with knowledge, tools, and skills that are future ready, and the NRDC is the perfect platform for researchers, stakeholders, and different agencies of the government to come together, formulate, and build a more resilient future for our country.

I am certain that despite the limitations of our platform at the moment, the 6th NRDC will be a success.

Ipagpatuloy po nating isulong ang pananaliksik habang tinatahak natin ang daan tungo sa pag-unlad at pagbangon!



Message



Reynaldo V. Eborá

Executive Director

DOST-Philippine Council for Agriculture,
Aquatic and Natural Resources Research
and Development (PCAARRD)

'Magtanim ay di biro,' especially in the aftermath of a storm. As we reflect on what remains, it is important that we appreciate how far we've come and the progress we've made. In doing so, we build the courage and hope to move forward and do better.

It has been more than a year since we experienced the pandemic. As we settle to the new normal, I would like to use this opportunity to thank our partners in the industry, the academe, and local government units (LGUs) in the agriculture, aquatic, and natural resources (AANR) sector whose cooperation helped our research and development (R&D) efforts reach the communities.

This two-day conference will feature some of the best technologies and innovations developed from government-supported R&D that are expected to fuel recovery in people's lives, the economy and the environment, among others. These technologies and innovations are grouped based on the government's whole-of-nation approach towards recovery: 'Kalusugan, Kabuhayan, Kaayusan, at Kinabukasan,' or the 4Ks. In showcasing these technologies and innovations, we hope to inspire our fellow Filipinos to strive and move forward towards the healing and development of our country as do these R&D workers who persevered to develop science-based solutions to the challenges faced by our generation.

We would also like to share with you the Harmonized National Research and Development Agenda (HNRDA) for 2022-2028. This reflects our efforts in the government to efficiently use our resources. Now, more than ever, we must stand together to strategize and innovate to leverage science-based solutions to further promote the sustainable use of our resources and build a more inclusive and resilient system. In the AANR sector, this is very crucial considering its multifunctional roles in development from food security, poverty alleviation, environmental sustainability, and climate change adaptation and disaster mitigation.

In light of the intensified burden that the pandemic imposes on our country's resources, DOST-PCAARRD will be resolute in ensuring that our investments in R&D are allocated efficiently and in response to crucial needs of agricultural development. We believe that together we can overcome the uncertainties brought about by the pandemic and lead the post-pandemic upturn in agricultural research for development.

'Magtanim ay di biro lalo na kung may sakuna. Gayunpaman, sa tulong ng pananaliksik at pagpapaunlad, tayo ay patuloy na babangon.' I wish you all the best for your health and safety during these times. 'Mabuhay tayong lahat!'



Message



Enrico C. Paringit
Executive Director
DOST-Philippine Council for Industry,
Energy, and Emerging Technology
Research and Development (PCIEERD)

DOST-PCIEERD conveys its warmest greetings to the hardworking organizers and active participants of the 5th NRDC. This gathering of researchers from the academe, government agencies, and private companies attests to the pivotal role that the scientific community contributor to positive change.

Amid the current global health crisis, we deem this conference instrumental to our country's r as it champions innovations from R&D as our expressway towards the Philippines' holistic recovery.

We salute the featured Filipino scientists and researchers for their contributions in leveraging science and technology to ensure that we arrive at a better, brighter future. May their achievements inspire the broader scientific community to partake in DOST's goal to discover more knowledge and develop innovations that will spur economic growth. This 5th installment of this annual event is a culmination and celebration of the hard work put in by Filipino scientists and engineers.

Through this year's NRDC, we at DOST-PCIEERD showcase 18 innovations that are envisioned to enrich Filipinos' health and livelihood and maintain orderliness for a desirable future. These and the many other innovations that we support are a testament of our commitment in ensuring that the country's S&T community remain replete with opportunities that empower human resources, facilitate the development of research and academic institutions, and generate more S&T policies, strategies, and technologies that will elevate our countrymen's way of living.

DOST-PCIEERD is truly honored to be a part of this event all the initiatives and developments underscored are not just a win for the DOST, but more of our country's, as these are, above all, envisioned to impact every Filipino.

Message



Marieta B. Sumagaysay
Executive Director
DOST-National Research Council
of the Philippines (NRCP)

Congratulations to all the researchers, scientists and experts who shared the results of their scientific inquiries which were conducted in order to address pressing societal needs. The 2-day conference has provided a venue for the exchange of research findings, for the updates on its state of utilization and adoption by relevant sectors, and for getting ideas (better still, commitments) on future partnerships, collaborations and synergy of scientific efforts.

The National Research Council of the Philippines is steadfast in ensuring that basic research is promoted, and policy research is strengthened to generate new knowledge and to provide the science and evidence for informed decision making, respectively. It is committed to enhancing its initiatives in science, technology and the arts along the HNRDA, particularly the National Integrated Basic Research Agenda (NIBRA), which focuses on issue-based R&D and S&T programs.

As the nation heals as one and as it recovers resiliently from the COVID-19 pandemic, the Council responds by deepening its KTOP (Kapakanan ng Tao sa Oras ng Pandemya)-COVID program, which deals on the multi-faceted social dimension of the pandemic. Among others, it will also heighten its natural products discovery from rare environments program to address future pandemics and disasters. In this 2021 NRDC, the Council's experts shared CCMon (COVID Cases Monitor) as a decision support tool, sustainable ecotourism amid the pandemic, supply of fresh vegetables, and mangrove soils as source of actinobacteria to fight drug-resistant bugs.

It is science we must trust.

It is the fusion of science and the arts that we must push to nudge behavioral changes, hence, address pressing societal issues towards the attainment of a quality of life that every Filipino dreams of in Ambisyon 2040.

Again, my sincere congratulations.



Program

Kalusugan	
Public health interventions against COVID-19	
Genome sequencing of SARS-CoV-2 for public health pandemic response	Mr. Gerardo Polotan
Development of Living Clinical Practice Guidelines for COVID-19 Management, Infection Prevention and Control (Pilot Study and Phase 1)	Dr. Marissa Alejandria
SIBOL COVID Task Force-Telemonitoring Technologies	Dr. Edward Wang
SIBOL COVID Task Force-Telemetry System for COVID-19 PGH Response Team	Dr. Geohari Hamoy
SIBOL COVID Task Force-Telepresence Terminals for COVID-19 Response Team	Dr. Nathaniel Orillaza, Jr.
Validation Study of A Locally-Developed Electronic Stethoscope Prototype “E-Steth” Using A Phantom-Based Simulation	Dr. Michelle Cristine Miranda
The Beneficial Effects of Virgin Coconut Oil among Suspect and Probable Cases of COVID-19	Imelda Angeles-Agdeppa
Profiling Survey of Traditional and Alternative Health Care (TAHC) Practitioners in Four Provinces in the Philippines (Pilot-study & Phase 1)	Dr. Calvin de los Reyes
Ventilator Prototype Development	Dr. Erwin Enriquez
Photoluminescent metal nanocluster to detect, disinfect, and suppress the spread of coronavirus and other microorganisms	
baTID: RFID-band for Personalized Body Temperature Monitoring	
Printed Electronics and Nanotech Materials for the New Normal: Breathing with coughing sensor, Antiviral Nanotech for Air Circulator Filters, and Non-invasive Health Monitoring through Sensor Array Patch	
AMPLIFIED: miPCR: Development of a Microfluidic Miniaturised PCR Device (miPCR) for SARS-Cov-2 RNA Amplification via FDA-approved COVID-19 RT-PCR kits	Dr. Ricardo Jose Guerrero
AMPLIFIED ADDS: Development of an amplified DNA detection system for the detection of SARS-Cov-2 based on the thermocycler output of FDA-approved COVID-19 RT-PCR kits	Ms. Marie Jennifer Reolo
'SWIFTeR': A focused study to validate a rapid, simple and efficient isothermal COVID-19	Dr. Ricardo Jose Guerrero
SIBOL COVID Task Force-Disinfection Technologies SIBOL Personal Protective Equipment-Design and Development of Locally-Manufactured, Reusable, Powered, AirPurifying Respirator (PAPR)	Dr. Samuel Arsenio Grozman
SIBOL: CleanIntubate: Laryngoscope Blade Disinfection Device	Dr. Catherine Co
SIBOL SaniPod: Self-Contained Disinfecting Cubicle	Dr. Edward Wang
Development of Ready-to-Drink Pili (<i>Canarium ovatum</i> , Engl.) Pomace Tea	Dr. Elizabeth Arenas

Fortified Rice-Mongo Curls/ Fortified Rice-Mongo Blend/ Rimo Blend Instant Cereal Choco Flavor	Mr. Racky Doctor
Fortification of Rice with Vitamins and Minerals through Surface Modification Assisted by Ultrasonic Waves	Dr. Drexel Camacho
Securing Safe and Sufficient Food Supply thru S&T	Dr. Synan Baguio
FRESH Farms: Food Risk and Safety Analysis in Agricultural Farms towards Improvement of Control Strategies for Food Safety	Dr. Vachel Gay Paller
Kabuhayan	
Seaweed Drippings: Key to Farmers' Enterprises	Dr. Augie Fuentes
BioGroe and HormoGroe	Dr. Lilia Fernando
Site-specific Nutrient Management (SSNM) for Corn thru Nutrient Expert Software	Dr. Jesse Descalsota
Imagine Life with Edible Landscaping	Dr. Fernando Sanchez, Jr.
PlantKita: Financial Potentials with Ornamental Bamboos	Ms. Minda Odsey
Tissue Culture of Gugo, Why Not?	Ms. Janine Baguhin
Impact, Lessons Learned, Concerns, and Ways to Go in Ten Ecotourism Sites in the Philippines (Ecotourism in the Time of COVID-19 Pandemic)	Dr. Belinda Espiritu
CRADLE: Development of a Design Guideline Using Finite Element Analysis (FEA) for Semiconductor Packages	Dr. Aristotle Ubando
Protective Outerwear (POW) for Government Employees Project	Mr. Jackie Aquino
Pananaliksik at Kaunlaran Para sa Matatag na Kabuhayan	Dr. Juanito Batalon
Kaayusan	
CCMon (COVID Cases Monitor): Gender-specific insights based on COVID-19 Epidemiological and Socio-economic Data	Jomar Rabajante
Polisiya at Siyensya: Gabay sa Matatag na Food Security System	Dr. Ernesto Brown
Development of Health Index and Vulnerability Reduction System for Region 4B (D-HIVE 4B Capital)	Dr. Delia Senoro
R-TAP	Mr. Stephen Larcia
Fire Check: Urban Fire Hazard Mapping and Fire Spread Modeling	Prof. Aileen Joan Vicente
Project BUHAWI – (Building a Universal-Mount for Heavy Barrel Automated Weapon Integration)	Lt. Warlord Mojica

Kinabukasan

Fighting drug resistant bugs: Exploring medically important qualities of Actinobacteria	Ms. Irene Papa
Agham at Teknolohiya para sa Pangangasiwa ng Saribuhay at Kaunlaran ng Susunod na Salinlahi	Dr. Leila America
Ocean Plastic, Not Fantastic! Threats of Microplastics to Philippine Treasures	Mr. Jon Alfonso Horvidalla
Understanding Lightning and Thunderstorms for Extreme Weather Monitoring and Information Sharing (ULAT)	Mr. Jerico Orejudos
SWERVE: The Tool that Can Save You During a Typhoon	Mr. Karlo Timbal
Prepping for the worst climate conditions over the Philippines in the 21st century	Mr. Wilmer Agustin
Flood Risk Assessment for Mitigation and Effective Response (FRAMER) of Riverine Towns in Selected River Basins in Cavite, Batangas, and Quezon Provinces using Most Recent LiDAR DEM	Engr. Fabor Tan
Philippine Groundwater Outlook (PhiGO)	Dr. Maria Aileen Leah Guzman
QBX	Mr. Ryan Sabio
A Link-up of Geomatics and Social Science Research for the Development of Smart Cities (LUNGSOD) Project	EnP. Carmeli Marie Chaves
Formulation of a Settlements Model for New Growth Areas	
SMART Food Value Chain Program: Leveling-up of Quezon's Bagsakan Center Agri-Processing Facilities through Adoption of the Smart Food Value Chain Framework	Dir. Emelita Bagsit
Young Innovators Program	Dr. Ruby Raterta
Resilient Education Information Infrastructure for the New Normal	Mr. Philip Martinez
Road Research Project on the Use of Low-Density Polyethylene (LDPE) Polymer Waste (Plastic Bags) As Additive or Modifier in Hot Mix Asphalt	Engr. Neilsen Campit
Road Research Projects on the Use of Recycled Concrete Aggregates as Base Coarse Material	Engr. Ma. Celine Angeles
Space Technology and Applications Mastery, Innovation and Advancement (STAMINA4Space) Program	Dr. Maricor Soriano
Ultrafast MBE-Grown Terahertz Photoconductive Antenna Devices	Dr. Alvin Karlo Tapia
Technology Innovations for Mathematical Reasoning, Statistical Thinking, and Assessment	Dr. Ma. Louise Antonette de las Peñas

Development of Accreditation Protocol for the Minimum Energy Performance (MEP) for electric vehicle charging station with UP-EEEI and Field Demonstration of Electric Vehicle (EV) Charging Station with Cagayan State University	Dr. Lew Andrew Tria
Prototyping of solar assisted plug-in electric motor-powered boat	Engr. Febus Reidj Cruz
Hydrogen Fuel Cells for Cleaner Energy Future	Dr. Ronaldo Parreño Jr.
Vaccine Information Management System	Dir. Leo Cipriano Urbiztondo, Jr.
National Broadband Management Program	
Government Emergency Communications System	



About the Speaker




Dr. Augie E. Fuentes
President

Davao del Sur State College (DSSC)

Dr. Augie E. Fuentes is the very first College President of the Davao del Sur State College (DSSC). She is a certified and registered Doctor of Veterinary Medicine. She is also a licensed Agriculturist with focus on animal science. She is a Professor at the Institute of Graduate and Professional Education of DSSC. Prior to being a College President, she was appointed as the Vice President for Academic Affairs of the College. During her early years as a public servant, she served as the Director for Research, Extension and Development at Southern Philippines Agri-Business and Marine and Aquatic School of Technology (SPAMAST)-Digos Campus. She is involved with various research institutes including DOST. She is an active researcher with focus on animal science and value-adding products, such as coco sugar, herbs, seaweeds, among others.

She was awarded first place on the Best Development Award in Agriculture, Aquatic and Natural Resources as one of the proponents for the project titled, “CBSTBF on Coco Sap Production and TechnoMart Products: Propelling Coco Sugar Industry Development in Davao del Sur” by DOST-PCAARRD.

Dr. Fuentes obtained her Doctor of Philosophy in Agricultural Sciences, major in Animal Science in 2009 from the University of Southern Mindanao and her Doctor of Veterinary Medicine from the Central Mindanao University under the Integrated Study Grant Program.

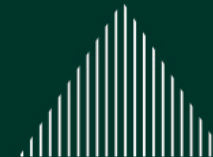


Seaweed Drippings: Key to Farmers' Enterprise

Marginalized seaweed farmers were beset with problems brought about by unfavorable conditions, such as decreased water quality, bad weather and diseases combined with very low buying price due to unscrupulous middlemen.

Rice, vegetables, and fruit farmers, on the other hand, suffer dwindling harvests due to excessive synthetic input, rendering their soil unproductive and their plants sickly.

DSSC offers a solution to these problems by developing KD Foliar Fertilizer. It is made out of drippings from *K. alvarezii* seaweeds, the species used in making carageenan. KD Fertilizer offers an effective and natural solution for various crops as it contains nutrients and growth hormones that can safely enhance crop growth and yield. KD Fertilizer is sourced from marginalized seaweed farmers of Davao del Sur who were trained and provided with specialized equipment by DSSC.



About the Speaker



Dr. Drexel H. Camacho

University Fellow and Full Professor
De La Salle University (DLSU)

Dr. Drexel H. Camacho is a University Fellow and a Full Professor of the Chemistry Department at DLSU. He currently holds the Br. Goslin Camillus FSC Professorial Chair in Life Sciences and the Don Jose Cojuangco Professorial Chair in Chemistry. He is the Nuclear Magnetic Resonance (NMR) Manager and Scientific Director of the DLSU Central Instrumentation Facility in DLSU-Laguna. In addition to his current responsibilities, he is the editor-in-chief of *Kimika*, the Journal of the Kapisanang Kimika ng Pilipinas (Chemical Society of the Philippines).

Dr. Camacho earned a Bachelor of Science (BS) in Chemistry for Teachers from the Philippine Normal University, where he was awarded magna cum laude. In addition, he finished his Master of Science (MSc) in Chemistry from DLSU, where he graduated with High Academic Distinction. In 2002, he obtained a Doctor of Science (DSc) in Chemistry, specializing in Organic Synthesis and Organometallic Chemistry from Tohoku University in Japan. He then pursued a Postdoctoral Fellowship in polymers at the University of California-Irvine.

He worked for Intel's semiconductor industry, where he was awarded the 2007 Employee of the Year. This was followed by a stint at the NXP Semiconductors where he was offered a position under R&D before he finally joined DLSU-Manila in 2009. He also served as a visiting professor at the Osaka University.

Dr. Camacho's accomplishments earned him multiple honors, such as the 2007 Third World Academy of Sciences (TWAS) Prize for Young Scientists in the Philippines, 2007 National Academy of Science and Technology (NAST) Outstanding Young Scientist Award, 2010 National Research Council of the Philippines (NRCP) Research Achievement Award, and 2017 Newton-Agham Leaders in Innovation Fellowship grant. His recent Scopus h-index is 15 with total citations of 1,315.

His research interests include organometallics, polymers, biocomposites, nanomaterials, food chemistry, and science education.

FORTI Grains Nutrio-Rice

Problem

There is a massive malnutrition problem among school children. According to the Food and Nutrition Research Institute (FNRI), there is a 15-year all-time high of 23% underweight and 38% stunted growth among children ages 1-6.

Government initiatives include the Child Nutrition Law, where it implements a mandatory Nationwide Child Nutrition Program in all public elementary school and Barangay day care centers and the Department of Education's (DepEd) Order No. 4 s. 2005, which mandates schools to offer natural or fortified food to address malnutrition among school children. However, there is a limited supply for fortified rice and is only limited to iron fortification. Its process is mostly extrusion, which is costly and cannot tolerate vitamins due to high temperature processing.

Solution

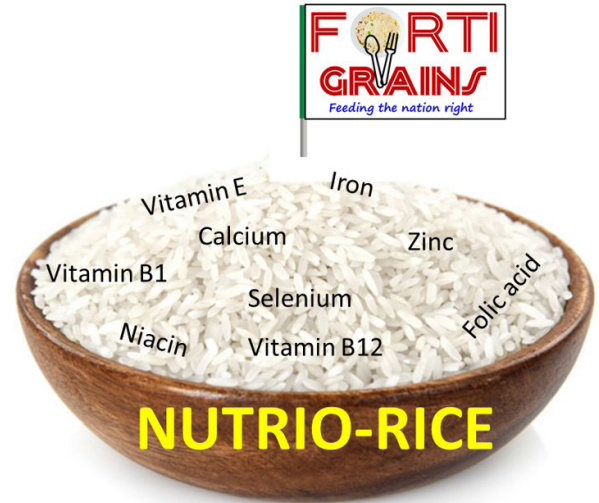
FORTI Grains Nutrio-Rice is produced through using rice as a carrier for micronutrients. This is achieved by modifying the rice surface to increase its vitamin absorption capacity by 135%. This process is capable of incorporating minerals and essential vitamins into the rice grains. In addition, this process is cheaper than the organic rice or the rice which is fortified through the extrusion process.

Business Model

- Contracts from Barangay feeding programs (42,036 Barangays)
- Contracts from school canteens (46,404 elementary schools)
- Supermarket consignment and online retail sales

Social Impact

- Healthy and nutritious rice made available to consumers makes the Philippines a healthy nation
- Partnering with rice farmer cooperatives helps improve the economic status of farmers





About the Speaker




Dr. Fernando C. Sanchez, Jr.
Professor
University of the Philippines
Los Baños (UPLB)

Dr. Fernando C. Sanchez, Jr. is a professor of Landscape Horticulture from the Crop Production and Management Division of the Institute of Crop Science, College of Agriculture and Food Science, University of the Philippines Los Baños (UPLB). For almost 30 years, Dr. Sanchez has been shaping the minds of UPLB agriculture students. From 2015–2020, he served as the 9th Chancellor of UPLB.

Dr. Sanchez graduated with BS Agriculture in 1987 from UPLB, where he also earned his MS Environmental Science in 1994. He obtained a full scholarship for his Doctor of Philosophy (PhD) in Landscape Architecture from the Tokyo University of Agriculture in 1998.

Since 2010, Dr. Sanchez led the Edible Landscaping (EL) team of UPLB as its project leader in promoting and disseminating the technology towards achieving food and nutrition security in the Philippines.

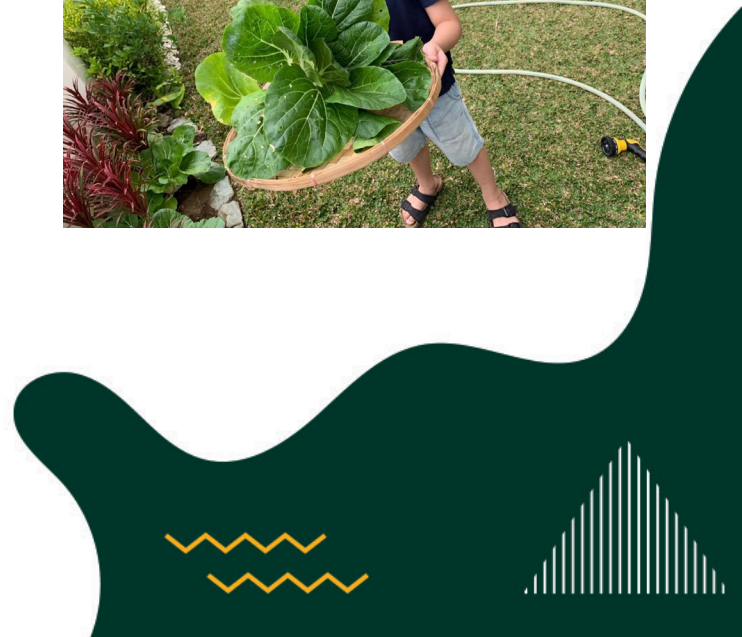
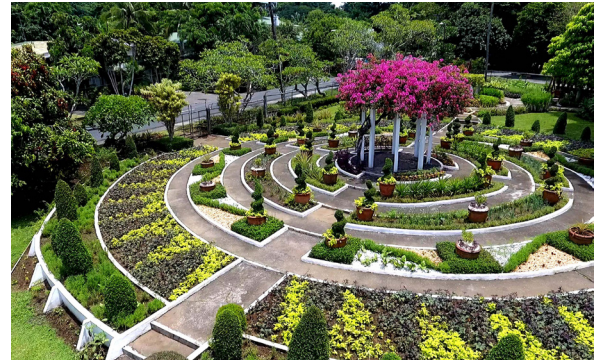


Edible Landscaping (EL)

EL is an innovative and creative food production technology that merges the science of crop production and the art of landscape planning and garden designing. It gives a twist in the conventional crop production with the basic tenets of landscape designing as its guiding principle.

Since 2009, the EL team of UPLB has been promoting EL all over the Philippines through conducting seminars, workshops, and trainings; disseminating starter kits and information materials; and establishing exhibits and demonstration gardens.

Now that we are facing the threats of the COVID-19 pandemic, the EL team of UPLB is committed to continue its projects and activities, especially with vulnerable communities situated in urban and peri-urban communities, towards a food and nutrition secure Philippines!



About the Speaker



Jesse C. Descalsota
University Researcher
UPLB

Mr. Jesse C. Descalsota is a University Researcher at the Institute of Plant Breeding (IPB) of the College of Agriculture and Food Science, UPLB.

He is a graduate of Bachelor of Science in Biology, major in Genetics. He also finished his Masters Degree in Genetics with Biochemistry as his minor field of specialty. He is currently doing his Doctoral Degree in Plant Breeding. He is leading the project on developing and validating site-specific nutrient management in cassava. He is also part of the team engaged in the promotion and utilization of Site-specific Nutrient Management (SSNM) technology for maize. The team is also engaged in the upgrading and maintenance of nutrient expert for corn and cassava, as well as the development of SSNM technology for other crops.

SSNM Gamit ang Nutrient Expert for Maize (NEM) para sa Produksyon ng Mais sa Pilipinas



Ang Nutrient Expert ay bunga ng maraming taon ng pananaliksik. Ito ay nakabatay sa SSNM technology kung saan ibinigay ang nutrisyon sa halaman sa panahon at paraan na ito ay pinakakailangan.

Ipinalalaganap nito ang 4R Nutrient Stewardship

- right source of nutrients (tamang uri)
- right rate (tamang dami)
- right time (tamang panahon)
- right place (tamang lugar)



About the Speaker



Minda S. Odsey

Supv. Science Research Specialist
Ecosystems Research and Development
Bureau (ERDB)-Watershed and Water
Resources Research, Development and
Extension Center (WWRRDEC)

Minda S. Odsey is the curator of the Philippine Bambusetum located at WWRRDEC, Loakan Road, Baguio City. She has extensive experience on bamboo technologies and is a trainer on descriptive morphology of bamboo species in the Philippine Bambusetum and ERDB protocols on bamboo stock production using culm cuttings, branch cuttings, and clump division.

As study leader of the Ornamental Bamboo Production for Watershed Rehabilitation and Poverty Alleviation, she led researchers and partner-stakeholder SALENG, Inc. in rehabilitating a degraded area with ornamental bamboos. She's instrumental in linking the Peoples' Organization (PO) to markets ensuring additional income for them. She also facilitated the preparation of a draft policy for accreditation of green livelihoods in watersheds.

Odsey is a nature lover and has passion for conservation of plants. These hobbies paved the way to her expertise in resource valuation for sustainable development which made her a trainer on resource valuation and accounting.



Ornamental Bamboos for Watershed Rehabilitation and Poverty Alleviation

The project “Ornamental Bamboo Production for Watershed Rehabilitation and Poverty Alleviation” was implemented in Cabiten, Mankayan, Benguet from 2018–2019. It aimed to explore the potential of ornamental bamboos in rehabilitating denuded and degraded watershed areas and in increasing stakeholders’ income through green livelihood technologies.

Among the 20 ornamental bamboos that were planted, 13 of which are rehabilitative of open canopy degraded areas; while 7 are rehabilitative of close canopy degraded areas. Purple bamboo (*Chimonobambusa neopurpurea* Hsueh & T.P. Yi) gives members additional income during its peak season, while the Ruscus-leaf bamboo (*Shibatea kumasaca* [Zoli. Ex Steud.] Nakai) gave the organization an additional income of P25,000.00. Yellow bamboo performed best in watershed rehabilitation.

To date, the project rehabilitated 1 hectare (ha) of open canopy degraded lands in Barangay Cabiten, Mankayan, Benguet. Bamboos that exhibited poor performance in open canopy areas were replanted in the backyards of SALENG, Inc. members where they discovered ornamental bamboo gardening economically worthwhile and conducive to a healthy lifestyle.





About the Speaker



Jon Alfonso “Jono” P. Horvidalla

Science Research Specialist II
ERDB-Coastal Resources and Ecotourism
Research, Development and Extension
Center (CRERDEC)-ERDB

Jon Alfonso “Jono” P. Horvidalla is a Science Research Specialist II of CRERDEC-ERDB, which is the research arm of DENR. He is the proponent and one of the study leaders for the study, “Microplastic Contamination Determination in Selected Major Water Bodies of the Philippines,” which determined the current state of microplastic pollution in the different marine waters of the country.

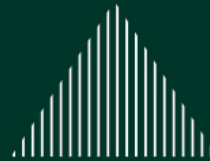
Having a degree in biological sciences and trained in microbiology and biotechnology during his college days, Horvidalla focused his works and advocacies on the preservation and management of the country's natural resources, particularly on areas of coastal and marine ecosystems. Since he started working for CRERDEC-ERDB, his research works revolves on mangroves and coral reefs, where he led several research studies and been involved on different research teams who conducted ecosystems assessments and public awareness through information and education campaigns. He also serves as resource person on different technical trainings and a presenter on research symposiums and conferences.

He is an avid wildlife photographer, scuba diver, and triathlete. He can often be seen running, cycling, swimming, walking, and taking photographs of birds in Iloilo City.



Microplastic Contamination in Philippine Marine Waters

The current study confirmed and detailed the presence of microplastics in 10 marine water bodies in the Philippines with consideration to its dispersion in terms of distance relative to the shoreline, water column, season, and microplastic types. This poses a threat to the marine resources of the Philippines as microplastics were already present on protected areas, fishing grounds, and tourist areas. Several studies already presented that commercial fishery products, such as bivalves and fishes were contaminated with microplastics and could be detrimental to both animal and human health. This calls for the conduct of future related studies that could describe the quantities of microplastics in the tissues of corals and other commercially-important fishery species that are frequently used for human consumption. Also, there is a need for monitoring studies of microplastics in which the data could be used in the formulation of statistical models that could predict the increase/decrease of microplastics with relation to certain environmental and hydrodynamic parameters. Studies dealing on the identification of major sources of plastic wastes both in land and open water should also be done to identify the problem at its source to formulate management plans for proper disposal of solid wastes. The researchers also recommend a cross-boundary effort in the implementation of solid waste management policies and regulate single-use plastics and exfoliants in cosmetics to reduce the land-based sources of microplastics. The LGUs, Protected Area Management Board (PAMB), and other governing bodies should have a concrete plan on the proper management of plastics, from the production stage to disposal. In support of those management plans, policies on solid wastes management should be streamlined with other related existing policies and regulations that demand appropriate fines and penalties. The schools and the academe, together with private organizations, should also be engaged in communicating the importance of recycling and upcycling as measures to manage plastic and other solid wastes to the local community. The production of effective IEC materials and the use of social media platforms to share relevant information are also crucial steps towards a well-informed and plastic-free community.





About the Speaker




Janine Cortiguerra-Baguhin
Science Research Specialist II
DENR-ERDB

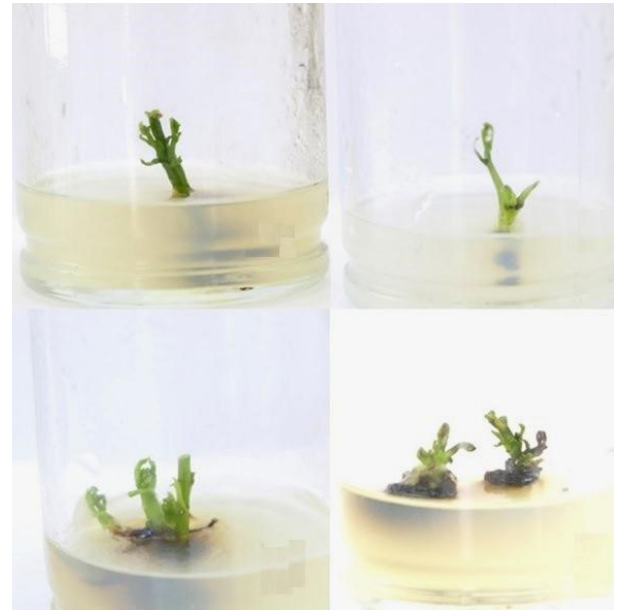
Janine Cortiguerra-Baguhin is a Science Research Specialist II under the Laboratory and Experimental Services Division (LESDB) of DENR-ERDB. She has knowledge and experience on various propagation methods for ornamental plants and trees, especially in tissue culture. She was involved in the conduct of research on tissue culture of various priority forest tree and bamboo species when she joined the Bureau.

In 2018, she conducted her own micropropagation study on Gugo, an important traditional medicinal plant in the country. She also provides several technical seminars and trainings to ERDB clients.

As part of her accomplishments, she has written and published articles regarding plant tissue culture.

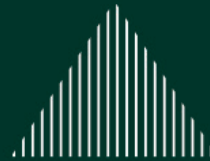


Enhanced Seed Germination through Tissue Culture Techniques of Gugo [*Entada phaseoloides* (L.) Merr.]: An Important Medicinal Plant in the Philippines



Entada phaseoloides (L.) Merr. also known as gogo or gugo belongs to the family *Fabaceae* which is a medicinal plant found in warm tropical Asian countries. In the Philippines, it can be found in the forests at low and medium altitudes, from Cagayan Northern Luzon to Mindanao and Palawan. The species is best known and extensively used for its several medicinal and cosmetic values. This forest vine is also used as raw material for cordage, net, and handicraft making. The conventional way to propagate gugo is by seeds. The dormancy period of seeds prolongs up to 5 years.

In 2018, ERDB conducted a micropropagation study to rapidly propagate the species. Appropriate type of explant and initial surface disinfection procedure were determined for the *in vitro* establishment of gugo. Culture conditions including required light intensity, temperature, and source of nutrients and supplements to improve shoot development were also optimized during the protocol development. Although the micropropagation protocol was not fully developed, researchers were able to further reduce the germination period of gugo from 15 days to only 10 days and induce multiple shoot buds from explants. The findings from this study can serve as baseline information for further biotechnological research on this valuable medicinal plant.





About the Speaker



Dir. Leo Cipriano Urbiztondo, Jr.
Director
Government Digital
Transformation Bureau

Dir. Leo Cipriano Urbiztondo, Jr. is the Director of the Government Digital Transformation Bureau and the Project Director for the National Broadband Plan. He is also the former Project Director of the Free Public Internet Access Program, also known as the Free Wi-fi for All of DICT's National Government Data Center.

He earned his BS Electronics and Communications Engineering from the University of Science and Technology of Southern Philippines in Cagayan de Oro City. He is a Professional Electronics Engineer and is currently taking an Executive Masters in Disaster Risk and Crisis Management (EMDRCM) at Asian Institute of Management (AIM). He completed academic requirements in Masters in Business Administration (MBA) and Masters in Technician Teacher Education (MTTE).

He has 25 years of hands-on ICT experience and has been a speaker to countless seminars around the country and conducted various webinar overseas. He has been speaking to more than hundreds of seminars, fora, and conferences about business, policies, technologies, processes, and leadership, among others.

Currently, he leads the VaxCert Systems development team.



Digital Transformation on COVID-19 Response: The Case of the Vaccine Information System Rollout

The Vaccine Information Management System (VIMS) was developed to streamline the vaccination process. The VIMS covers the entire immunization process from registration to the actual inoculation. It even offers a monitoring facility for adverse events following immunization (AEFI). Data and insights are continuously being harnessed to scale up and further improve the system. The VIMS provides a holistic support to the immunization program by utilizing digitization from pre-implementation up to post-implementation of each inoculation cycle.

Through its modular design, the VIMS is adaptable to the varying processes and capacities of LGUs and Bakuna Centers. The VIMS is composed of two main sub-systems, which are the VIMS-IR (Immunization Registry) and the D-VAS (DICT Vaccine Administration System). The VIMS Immunization Registry is designed to gather information for demand planning, allocation, and distribution of the vaccines in the pre-implementation phase of the immunization program. Meanwhile, the D-VAS, simultaneously facilitates and gathers valuable information during actual vaccination on the ground, making processes more efficient.



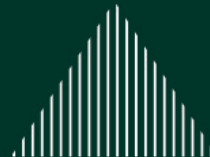
GECS-MOVE: ICT-enabled and Integrated Communication System to Support Disaster-stricken Areas in the Philippines

The Government Emergency Communications System - Mobile Operations Vehicle for Emergency (GECS-MOVE) is a rapid deployable emergency communications system that aims to provide ICT-enabled support to disaster-stricken areas in the country. It serves as the intermediary connection between the National Disaster Risk Reduction and Management Council (NDRRMC) and the Regional DRRM Unit.

The GECS-MOVE has three features. The MOVE Hub, the MOVE Dispatch, and the MOVE Motorbike. The MOVE Hub is fundamental to this integrated communications system as it serves as the heart of the system. It is synchronized with the NDRRMC Operations Center to enable wired and wireless connectivity for data and voice communications. The decision makers are given authority to access the Hub to monitor, decide, and dispatch resources to the affected areas.

The MOVE Dispatch, on the other hand, provides extended coverage of connectivity for responders at ground zero. It also sends critical information to the community, such as the evacuation locations and announcements. This will also send and validate video and image data to the Hub. The data gathered will be used by the Incident Commander to make sound and correct critical decisions.

With the GECS-MOVE, the government would be able to formulate good, quick and timely, and effective decisions and disaster-responses to the disaster-stricken areas. Hence, decreasing, if not eliminating, casualties and increasing the chance to save more lives and properties.



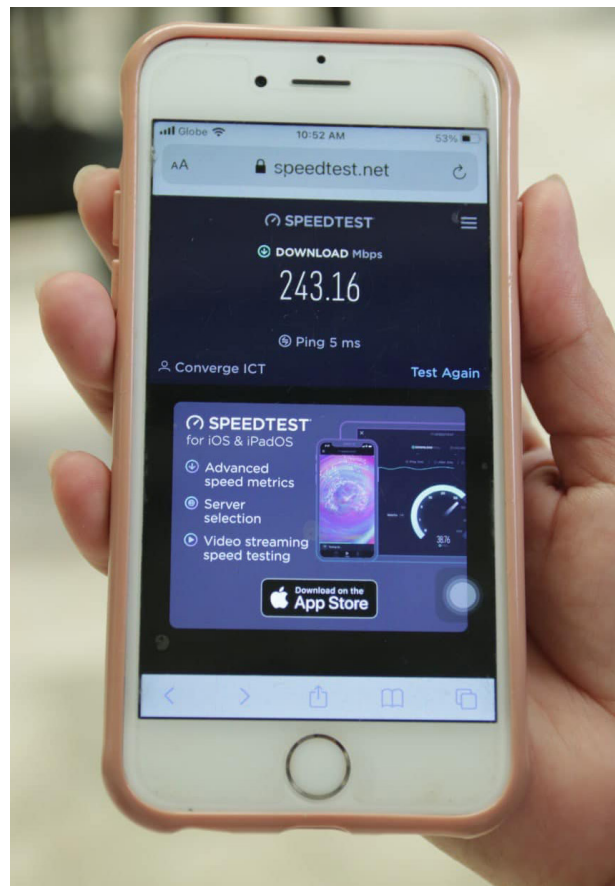
National Broadband Plan in the PH: Accelerated Fiber Optic Cable and Wireless Technologies

In 2017, DICT crafted the National Broadband Plan in an effort to improve the overall quality of the internet in the country. This is a response to the citizens' call for faster and cheaper internet. The government came up with a blueprint that will accelerate the deployment of fiber optic cables and wireless technologies. The plan is to provide an inclusive, affordable, and trusted broadband internet access for all.

The Department started with laying fiber optic cables to fill the gaps in the existing network in Luzon. This will later move south to improve the network in Visayas and Mindanao. Alongside this, two cable landing stations are being built to strengthen the country's international connectivity.

In order to close the digital divide, satellite overlay will be built in isolated locations, such as mountainous, coastal, and small islands where fiber network facilities can be challenging. This will be in place until such time as fiber and broadband connection reaches them.

By providing better broadband connection, the government may strengthen e-governance and take advantage of the digital platform to improve public service delivery. Businesses will have better chances of entering the global and digital economy. Lastly, citizens will also have access to unlimited opportunities for personal development and be able to connect to communities online.



About the Speaker

Lt. Warlord V. Mojica PN is a Plans and Program Officer of the Naval Research and Technology Development Center.

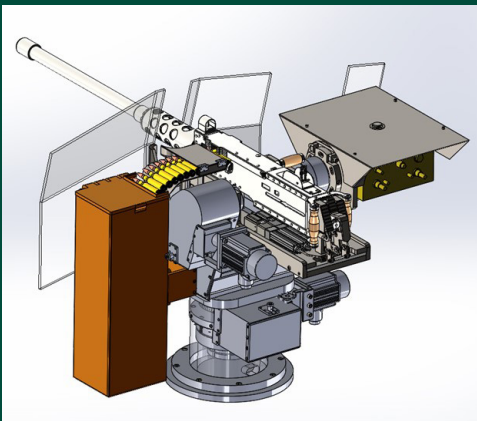
His previous designations are: Damage Control Officer of BRP Conrado Yap; Officer-in-Charge (OIC) of the administrative branch for repair and maintenance; Chief of the administrative branch for repair and maintenance; and Operations Officer for Naval Station Romulo Espaldon and Naval Forces Western Mindanao.



Lt. Warlord V. Mojica PN
Plans and Program Officer
Naval Research and Technology
Development Center

Project BUHAWI (Building a Universal- Mount for Heavy Barrel Automated Weapon Integration)

Project BUHAWI is a fully automated remote weapon station (RWS) for 50 Caliber HMG which aims not only to enhance the firepower capability of Navy floating assets (78-fts) but can also be a universal gun mount for other defense program of the AFP.





About the Speaker





Dr. Ronaldo P. Parreño, Jr.
Senior Science Research Specialist
DOST-Industrial Technology
Development Institute (ITDI)

Dr. Ronaldo P. Parreño Jr. currently works at the Chemicals and Energy Division of DOST-ITDI as the project leader on the development of fuel cell technology. The project's main goal is to contribute vital research and testing solutions in the development of localized fuel cell technology. He hopes that his passion for R&D would lead to new breakthrough and innovative solutions for the incremental improvement of next-generation fuel cells, in line with his advocacy on the sustainability of energy resources.

He earned his MS in Energy Engineering from the University of the Philippines Diliman (UPD) and a PhD in Chemical Engineering from DLSU-Manila.

His research exchange at the National Tsing Hua University in Taiwan led to the development of nanofiber-based membrane using novel combination of polymeric materials with useful properties for high-performance applications. This research motivated him to further his study on proton conducting membrane. Among his research expertise are inverse vulcanization, electrospinning, membrane fabrication, polymer blending, sulfonation reaction kinetics and mechanisms, surface-initiated grafting, and ozone treatment and composites.



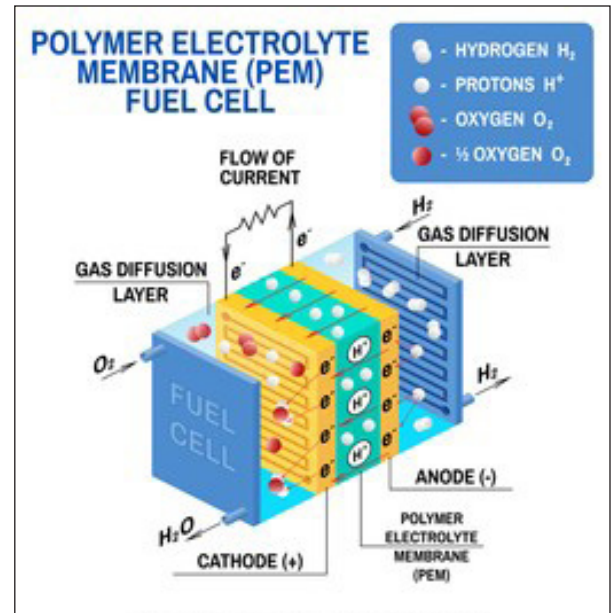
Establishment of Fuel Cell R&D and Testing Facility

Fuel cell is a vital element in the current energy system's shift to hydrogen as a clean and sustainable energy source. It is an electrochemical device that converts the chemical energy of fuel directly into electrical energy without fuel combustion (Peighambardoust et al., 2010). This technology combines the cleanliness of hydrogen as an energy carrier and efficiency of fuel cell to generate more power and lessen dependence to fossil fuels (Marban & Valdes-Solis, 2007).

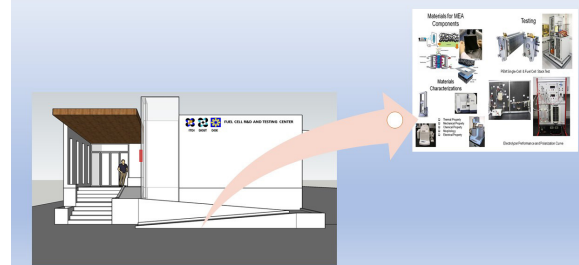
They offer a broad range of benefits, such as reduced greenhouse gas emissions; oil consumption, and air pollution; expanded use of renewable power; highly efficient energy conversion; and fuel flexibility. Aside from being an efficient energy conversion device that emits zero to very low level of carbon, it is reliable, has lower maintenance cost, and simpler design (Sobrino et al., 2010).

Because of their broad applicability and diverse uses, fuel cells can address critical challenges in energy sectors, such as industrial, transportation, and power generation. Currently, many countries continue their research efforts to fully develop and utilize the hydrogen fuel cell technology, focused on addressing major barriers, such as cost and performance.

Through the strategic collaboration between DOST-ITDI and the Department of Energy-Energy Utilization Management Bureau (DOE-EUMB), which will lead to the establishment of an R&D laboratory and testing facility, this project will accelerate the advancement and adoption of fuel cell technology in the country.



Fuel Cell R&D and Testing Facility





About the Speaker





Dr. Calvin S. de los Reyes

Project Leader

Macro Health Research Organization, Inc.

Dr. Calvin de los Reyes combines his passion for health studies and his love for travel as an educator and researcher. In the process, he has crafted a maternal and child healthy handbook for the Tagbanua tribe of Coron, Palawan and led a study that aims to give a voice and representation to the Philippines' healers and alternative medicine practitioners. He is the project leader of the Profiling Survey of Traditional and Alternative Health Care, which is being done by Macro Health Research Organization, Inc. (MHROI) and the Philippine Institute for Traditional and Alternative Health Care (PITAHC). This is a nationwide study that seeks to look into the feasibility of a national registry for traditional and alternative healers.

Dr. de los Reyes is a Senior Lecturer in the Graduate Program for Health Policy Studies at the University of the Philippines Manila. He also serves as a Senior Lecturer of the Department of Global Health at Ryukyus University. He obtained his PhD in Human Sciences (International Health) from Osaka University in Japan under the tutelage of Prof. Yasuhide Nakamura, a renowned specialist on MCH and MCH Handbook. He is a founding board member of the International Committee on MCH Handbook. For more than a decade, he worked in JICA training programs as a resource speaker and as a course leader.



Profiling Survey of Traditional and Alternative Health Care (TAHC) Practitioners in Four Provinces in the Philippines

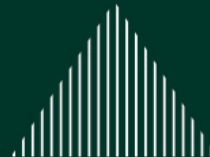


The lack of official recognition and information on TAHC practitioners hinder the provision of appropriate research, training, and development. This study aimed to determine the number and profile of TAHC practitioners in four provinces in the Philippines. Another objective is to determine the feasibility of integrating TAHC in the health service delivery system, including the acceptability of TAHC in the community and strategies to effectively promote the registration of TAHC practitioners, and provide policy and research recommendations.

Profiling survey, with key-informant interviews (KIIs) and focus group discussions (FGDs), was conducted in the provinces of Quirino, Oriental Mindoro, Samar, and Agusan del Sur. All practitioners in the randomly selected municipalities or cities in each province were interviewed. There were also FGDs conducted with TAHC practitioners and patients or consumers, and KIIs with government and nongovernment organizations. Stata Version 12 were used to process quantitative data, while NVivo 12 was utilized for qualitative analysis.



Among the four provinces, a total of 2,691 practitioners were listed and profiled. Most TAHC practitioners are female, married, Roman Catholic believers, and have a different occupation aside from healing. Additionally, most have 20–39 years of experience, tends up to 100 patients per month with a minimum charge, while some offer their services for free. Meanwhile, FGD and KII reveal that TAHC is accessible and affordable especially in geographically isolated areas, yet, participants observe a decline in the number of practitioners in recent years. Support is visible within the health system, especially from those who have had childhood experiences with TAHC. However, knowledge and practice could be improved through training and standardization. Lastly, registration is viewed as a key to removing taboos associated with TAHC, while providing a platform for the enhancement and improvement of knowledge.





About the Speaker

Francisco Polotan is a Science Research Specialist II of the Molecular Biology Laboratory of RITM and is currently acting as the Bioinformatician for the Research Section.

He earned his MS Molecular Biology and Biotechnology from UPD and his BS Health Sciences from ADMU. His current research activities in RITM involve whole genome sequencing, metagenomics, and phylodynamic analysis of infectious diseases.

Mr. Polotan is a co-investigator of the GECO Project together with project members from the Research Institute for Tropical Medicine and from the University of Glasgow at Scotland.



Francisco Gerardo M. Polotan
Science Research Specialist II
DOH-Research Institute
for Tropical Medicine (RITM)

Genomic Epidemiology of COVID-19 (GECO) Project

The GECO Project is a research initiative spearheaded by DOH-RITM and supported by funding from the UK Department of Health and Social Care (DHSC) through the National Institute for Health Research (NIHR) and the Medical Research Council (MRC) which is part of the UK Research and Innovation (UKRI).

The project is focused on harnessing genomic sequencing data to inform public health interventions. The DOH RITM in cooperation with the University of Glasgow facilitates this project to establish rapid SARS-CoV-2 sequencing technology in the DOH Subnational Laboratories.





About the Speaker



Marissa M. Alejandria

Director

Institute of Clinical Epidemiology,
National Institutes of Health
UP Manila

Dr Alejandria is a Professor of Clinical Epidemiology at the University of the Philippines College of Medicine and a Clinical Professor of Infectious Diseases at the Philippine General Hospital. She currently serves as Associate Dean for Research at the UP College of Medicine and Director of the Institute of Clinical Epidemiology at the National Institutes of Health, UP Manila. She is also the current President of the Philippine Society for Microbiology and Infectious Diseases (PSMID).

Dr Alejandria has more than 10 years of experience in clinical epidemiology research and clinical management of infectious diseases. Her research expertise is on the conduct of epidemiological research, health care quality improvement research, health systems research and developing systematic reviews and clinical practice guidelines for national implementation. She supervised the development of the Philippine Clinical Practice Guidelines on TB, Leptospirosis, Urinary Tract Infections, Acute Infectious Diarrhea, Sepsis, among others in collaboration with relevant stakeholders.

With the advent of the COVID-19 pandemic, Dr Alejandria coordinated the conduct of various clinical research at the Philippine General Hospital. She is currently the National Coordinator of the WHO Solidarity Therapeutics Trial in the Philippines and an appointed member of the WHO Executive Group of the International Steering Committee of the COVID-19 Solidarity Trial. She facilitated the development of the PSMID Interim Guidelines for COVID-19 management and participated in crafting the Unified Algorithms for COVID-19. She is currently the Project Leader for the Development of the Living Clinical Practice Guidelines for Management, Infection Prevention and Control of COVID-19 in collaboration with various medical societies.



Development of Living Clinical Practice Guidelines for COVID-19 Management, Infection Prevention and Control (Pilot Study and Phase 1)

The Philippine COVID-19 Living CPG project was conceptualized to provide up-to-date, evidence-based recommendations on the treatment, diagnosis, infection prevention, and control of COVID-19 among adults at risk for COVID-19 as a response to the infodemic of misinformation and disinformation. In a Living CPG Model, the CPG development process is optimized through regular surveillance of the literature to allow updating of recommendations as soon as new evidence becomes available. We used the GRADE methodology in evaluating the certainty or quality of the evidence for each of the priority questions. A multidisciplinary consensus panel voted on the direction and strength of the recommendations, taking into consideration the following factors: the quality of the evidence, the magnitude of benefits and harms, cost, equity, applicability, feasibility issues, values and preferences of the provider and the patient. The Living CPG Document provides guidance to our health care providers on the diagnosis, treatment, critical care and respiratory management of COVID-19, non-pharmacologic interventions, adjunctive treatment, vaccines and prophylaxis against COVID-19. The evidence summaries and recommendations can be accessed at the PSMID website (www.psmid.org). Send us an email at covidcpg.ph@gmail.com for any questions or clarifications on the outputs and process of the Living CPG. You may also suggest a clinical question for the consideration of the Living Clinical Practice Guidelines COVID-19 Taskforce.





About the Speaker



Dr. Belinda F. Espiritu
Professor of Communication
UP Cebu

Dr. Belinda F. Espiritu is a Professor of Communication in UP Cebu. She teaches Critical Perspectives in Communication, Communication Theory and Research, Organizational Communication, Intercultural Communication, and Development Communication. Her research articles have appeared in local and international Communication journals like Media Asia, Asian Journal of Communication, Journal of Alternative and Community Media, and Peace Review.

Her research interests are on alternative media and globalization, internet activism, social and environmental justice, sustainability and development communication. She served as the Director of the UP Cebu Central Visayas Studies Center from 2018–2020 during which time she was involved in the research on tourism and ecotourism in the Philippines in particular. She is an advocate of sustainability, organic farming, simple living but high thinking, holistic health, and natural healing.



Ecotourism in the Time of COVID-19 Pandemic

With the unexpected coming of the COVID-19 pandemic, unprecedented global travel restrictions and stay-at-home orders caused the most severe disruption of the global economy since World War II (Gossling et al., 2020) How did our ecotourism industries fare with the onslaught of COVID-19? What were the worst things that the ecotourism industries suffered from and were there any positive things that happened? What are the concerns, lessons learned, and prospects or ways to go of the ecotourism industries at present and in the near future with the new normal?

A research was conducted on these with a case study of 10 ecotourism sites in the Philippines from Luzon to Visayas to Mindanao. The researchers made use of a COVID-19 Impact Assessment Tool and conducted an online focus group discussion (FGD) and a focus group interview with tourism operations officers and ecotourism management officials.

Lessons Learned and Ways to Go

There should be an ecotourism management's formulation of contingency plans in case of unexpected crises like a global pandemic. Alternative sources of income or livelihood projects should be planned and operated both in normal times and in times of crises. Each local community must strive to become self-sustainable in terms of food security and the manufacture of local goods or industries. The idea of community-shared gardens is a very commendable one.

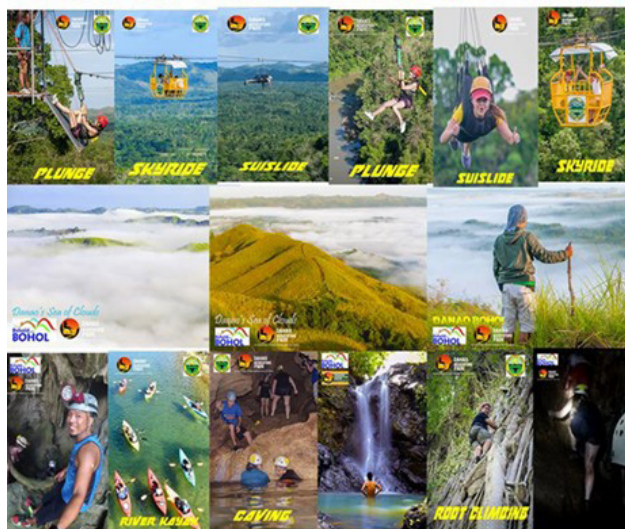
LGUs must encourage local tourism among its local residents and travel bubbles between provinces and regions can be arranged by LGUs.

Periodic rest for the ecotourism sites should be observed to allow for nature to rejuvenate itself.

Natural immunity boosters should be promoted, disseminated, or subsidized by LGUs to keep ecotourism workers and the Filipino people in general healthy and free from fear of contracting and dying from COVID-19.



DANA O ADVENTURE PARK



YOUR ULTIMATE ADVENTURE DESTINATION





About the Speaker



Dr. Vachel Gay V. Paller
Professor 6
UPLB

Dr. Vachel Gay V. Paller is a Professor under the Animal Biology Division, Institute of Biological Sciences, University of the Philippines Los Baños. She is active in teaching, mentoring, and scientific research, but her passion is doing science to help improve the lives of the Filipino people.

In addition to her current responsibilities, she is an officer of the Philippine Society of the Philippines and a member of the World Association for the Advancement of Veterinary Parasitology (WAAVP), the American Society for Tropical Medicine and Hygiene (ASTMH), and the Asia Pacific Congress for Parasitic Zoonoses (APCPZ).

Dr. Paller believes that parasitology needs more attention in developing tropical countries where parasites are widespread. Her research focus is on zoonotic parasites and the application of ONE Health in the control of zoonotic and foodborne neglected parasitic diseases.

Aside from being a scientist, Dr. Paller enjoys cooking, reading, singing in the church choir, and playing musical instruments.



FRESH FARMS: Food Risk and Safety Analysis In Agricultural Farms towards Improvement of Control Strategies for Food Safety



DOST-NRCP's FRESH FARMS Program (Food Risk and Safety Analysis in Agricultural Farms towards Improvement of Control Strategies for Food Safety) provides a science-based evidence on the need to address issues concerning food safety in the agricultural food supply chain. It developed new science to understand how pathogens survive and transmit through the farm environment to reduce biological hazards. It also developed improved detection methods of pathogens in fresh produce.

This program provided education and technical assistance to the leafy greens sector and other stakeholders, with greater emphasis on the potential impact of adjacent land uses, animal intrusions in the farms, and the importance of agricultural water quality. The impacts are extended on the improvement of farm management strategies, improved marketability of fresh produce, and promote food safety and public health. It is highly recommended that proactive steps and measures are implemented as the food supply web has become more extensive in the recent years.





About the Speaker



Irene Alcantara-Papa, MSc, DPAM
University Researcher III
National Institute of Molecular Biology
and Biotechnology (BIOTECH)-UPLB

Ms. Irene Alcantara-Papa is a University Researcher III of the Biotechnology for Natural Products Program, BIOTECH-UPLB. She specializes in Medical, and Agricultural Microbiology.

Her research focuses on the isolation and characterization of Actinobacteria with bioactivities against medically-important pathogens and as biocontrol agents against plant pathogens. She believes that a novel compound against medically-important pathogens can be discovered from their Actinobacteria collection.

Her contribution to science is the development of ACTICon™, a biocontrol agent that helps banana growers against the deadly *Fusarium oxysporum* f. sp. *cubense* (Foc TR4) in Cavendish banana. Through this, she was given the Outstanding Creative Research LIKHA Award in 2017.

In addition to her current responsibilities, she is a Diplomate of the Philippine Academy of Microbiology and a member of the Natural Products Program of UPLB.

At home, she loves cooking, gardening, and reading during her past time.



Harnessing Actinobacteria from Surigao del Sur Rare Environments Effective Against Medically-Important Pathogens

The emergence of drug resistant strains of bacteria poses a great threat worldwide, especially in the healthcare sector. This calls for the need to discover novel antibacterial compounds that are effective over a broad range of microorganisms. For decades, actinobacteria have been good sources of bioactive compounds, a significant number of these being antibiotics. In this study, actinobacteria were isolated from the unexplored and untapped environments (mangroves, seashores, agricultural areas) of Surigao del Sur and screened them for antibacterial activity against medically-important bacteria like *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and methicillin-resistant *S. aureus* (MRSA). A total of 556 actinobacteria were isolated and preserved and 13 actinobacteria were found to be with multi-activity against the pathogens mentioned. Utilization of these Actinobacteria collection and data will be a significant help for future drug R&D in the Philippines towards self-sufficiency and improved healthcare.







About the Speaker



Jomar F. Rabajante
Dean
UPLB Graduate School

Dr. Jomar Fajardo Rabajante is the Dean of the Graduate School, UPLB. He is a Professor and UP Scientist at the Institute of Mathematical Sciences and Physics, UPLB. He completed a Professional Certificate in Online Education from the University of Wisconsin-Madison, and currently he is an affiliate faculty member of the Faculty of Education, UP Open University. He holds an appointment as Junior Associate at the Quantitative Life Sciences Group of the Abdus Salam International Centre for Theoretical Physics in Trieste Italy. He is a fellow of the UP Resilience Institute and a member of the UP COVID-19 Pandemic Response Team. His research interest is mathematical modeling of complex biological and social systems.

Dr. Rabajante obtained in year 2016 his DSc Mathematical and Systems Engineering, major in Environment and Energy Systems from Shizuoka University Japan as a Japanese Government Monbusho scholar; MSc Applied Mathematics, major in Mathematics in Life and Physical Sciences from UPD as a DOST scholar; and BS Applied Mathematics, major in Operations Research from UPLB. He completed a Higher Education Teaching Certificate from the Derek Bok Center for Teaching and Learning in Harvard University and a Medical Statistics Certificate from Stanford University. He is one of the proponents and the co-chair for program implementation of the PhD in Applied Mathematics, the first and only doctorate degree in Applied Mathematics in the Philippines.



CCMon (COVID-19 Cases Monitor): Gender-specific Insights Based on COVID-19 Epidemiological and Socio-economic Data

The project focused on gathering and organizing epidemiological datasets, as well as social and economic datasets from DOH Datadrop (<https://www.doh.gov.ph/covid19tracker>) and Philippine Statistics Authority (<https://psa.gov.ph>); analyzing the data and connecting the different datasets; and creating visuals and data storyboards that can be used to draw gender-specific insights. The created online interactive dashboard which shows gender-specific insights related to COVID-19 can be used for academic or policy-making purposes.

The list of interactive charts includes the epidemic curve, cumulative cases, distribution of cases based on the health status, age distribution, sex, pregnancy status of female cases, date of death or recovery, number of days from symptom onset to death or recovery, and location of cases. Data on delays, testing, and health care capacity were also added in the dashboard. The data visualizations can be filtered, such as to show sex-disaggregated charts—this can be done by using the dropdown button or directly clicking the “male” or “female” element of a specific chart. On the dashboard, four main demographic variables were considered to investigate COVID-19 risks per location: population size, density, age distribution, and poverty incidence.





About the Speaker



Stephen Larcia
Chief Executive Officer
Hiraya Water

Stephen Larcia is a seasoned water professional. He started in Maynilad designing piped water networks. In Maynilad, he was also a project manager to a billion-peso world bank funded project. Later on, he established Maynilad's Project Stakeholder Management. Stephen moved to becoming a technology consultant to Metro Pacific Water and also helping small water utilities as volunteer work.

Until Stephen cofounded Hiraya Water. He now leads the company in its mission to make smart water management universally accessible, helping water utilities across the country address their inefficiencies, and contributing to Sustainable Development Goal 6: ensuring availability and sustainable management of water and sanitation for all.

He is a graduate of BS Civil Engineering from UPD.



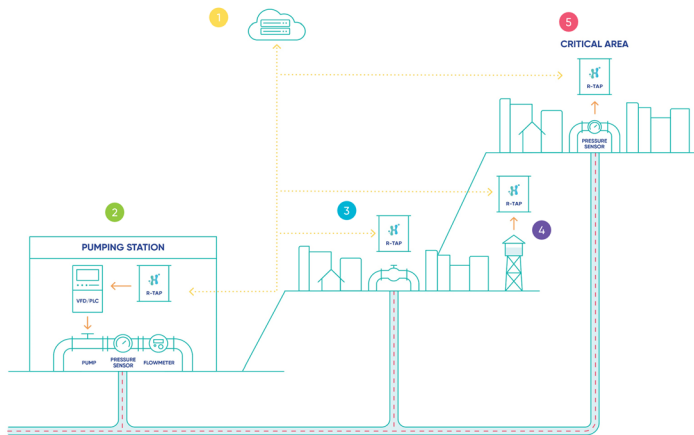
R-TAP Intelligent Supply and Pressure Management System

R-TAP is an intelligent supply and pressure management system. It uses artificial intelligence to optimize water supply networks. With R-TAP, the production at pumping stations and other sources is optimized, supply is rechannelled intelligently through accurate valving operations, and reservoirs are maximized. This helps water utilities reduce their Non-revenue Water (water losses), reduce power consumption and other operational expenses, improve availability of water (better service) and increase billed volume that also leads to financial sustainability of the water utility.

R-TAP now serves eight water utilities and counting. The research under DOST-TAPI's Technicom Program helped Hiraya Water bring the idea into commercialization. Under the project, Hiraya worked with water utilities to fine-tune the technology based on what they really need. The business model followed several iterations to help make the technology accessible to everyone.

HOW R-TAP WORKS

R-TAP does the work for you



R-TAP'S COMMUNICATION

R-TAP utilizes the most reliable existing communication infrastructure without compelling water utilities of huge capital expenditure.

1

R-TAP'S ARTIFICIAL INTELLIGENCE

Dynamic and adaptive system that handles short term variations and long-term development in the water network.

2

R-TAP FOR PUMP CONTROL

R-TAP uses historical and real-time data from strategically identified locations within the network providing more accurate controls.

3

R-TAP FOR VALVE CONTROL

R-TAP guarantees compatibility with different levels of automation, from motorized valves with actuators, to manually operated valves.

4

R-TAP FOR TANK OPTIMIZATION

R-TAP ensures that existing reservoirs are used based on the actual needs of the network. This includes having single or multiple sources feeding into the reservoir. Safe yield of sources can also be considered in the optimization.

5

R-TAP LOGGERS AT CRITICAL POINTS

R-TAP provides constant monitoring and ensures that the ideal service level is experienced at the customer side.



About the Speaker



Wilmer Agustin
Weather Specialist II
DOST-PAGASA

Wilmer Agustin is a researcher in the field of climate projections and climate change impacts, with primary interest on agricultural impact. He has substantial experience in data processing and analytics, as well as data visualization and communication.

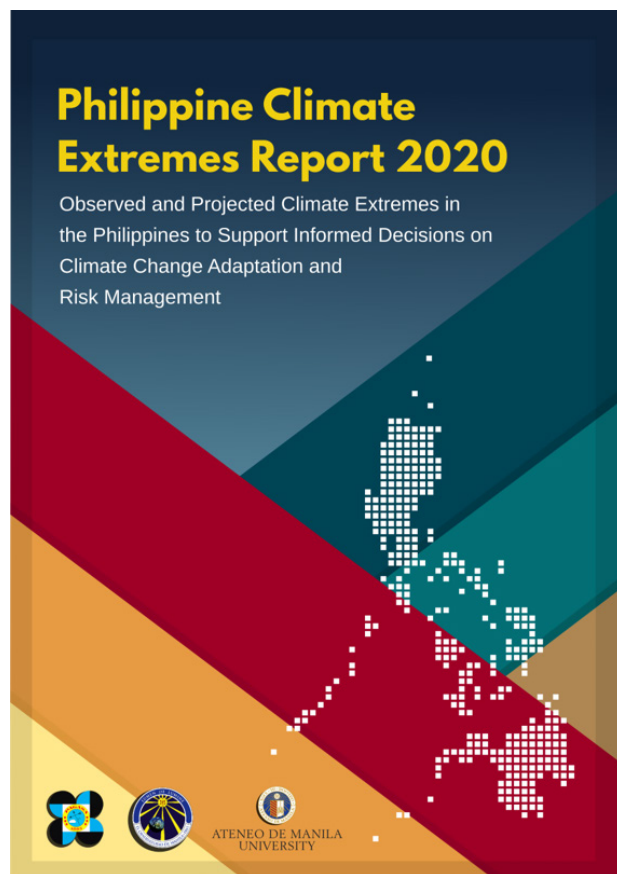
As a representative of DOST-PAGASA to the DOST-CORDEX project, he was involved in the production of the climate extremes projection and a contributing author to the Climate Extremes Report 2020.

During his off days from work, he is either playing badminton or consuming written works or narrations of fiction literature.



Prepping for the Worst Climate Conditions Over the Philippines in the 21st Century

The Climate Extremes Projection is a product of the collaborative efforts of the Manila Observatory, DOST-PAGASA, and Ateneo de Manila University, in the implementation of DOST-PCIEERD's funded project titled, "Analyzing Coordinated Regional Climate Downscaling Experiment-Southeast Asia (CORDEX-SEA) Regional Climate Simulations for Improved Climate Information over the Philippines: SST Influence, Variability and Extremes" or DOST-CORDEX project. The program primarily aimed to update the existing provincial climate projection information available to LGUs, which are used as reference in drafting local climate change adaptation plans. In addition, it also prepared knowledge enhancement materials for LGUs in the form of online modules and a printed report titled, "Philippine Climate Extremes Report 2020: Observed and Projected Climate Extremes in the Philippines to Support Informed Decisions on Climate Change Adaptation and Risk Management." The report features the national climate extremes projection maps, tables of provincial values, and extensive lists of sector-specific adaptation options for certain climate-related risks.





About the Speaker

Karlo Timbal started doing research on severe wind risk assessment in 2018 under the United Nations Development Programme (UNDP)-funded project, "Resilience and Preparedness towards Inclusive Development (RAPID)" and implemented by DOST-PAGASA.

Through the years of gaining knowledge and skills with PAGASA, Timbal was able help the institution through developing a tool that would simplify risk calculation and visualization for severe wind risk assessment. The SWERVE tool is designed to aid the LGUs to capacitate themselves in risk calculation and risk assessment. As a weather observer of the DOST-PAGASA, he also does researches on monsoon-typhoon interaction and weather and climate modelling.

In his pastime, he loves studying programming and 3D modelling software, playing computer games and the guitar, and riding his motorcycle.



Karlo Timbal
Weather Observer I
DOST-PAGASA



Severe Wind Estimation of Risk Using Vulnerability and Exposure (SWERVE) Tool



The SWERVE tool is a severe wind risk assessment analytics application (app) developed by DOST-PAGASA using the Qlik Sense platform. It can provide information about possible physical damage, economic loss or damage cost, number of damaged structures of both partial and complete states, and total affected population anywhere in the country. The selected LGUs are provided with an access to the portal hosted by DOST-PAGASA using their designated accounts. Using the app, the LGUs will be able to perform severe wind hazard and risk assessment. Furthermore, they can upload and update their existing exposure data and do risk assessment. The SWERVE tool serves as an easy way for the LGUs to assess the possible impacts of a tropical cyclone event, and plan ahead to mitigate and manage such disaster risks. Similarly it can aid the LGUs in their land use planning and post-disaster assessment reports and validation.





About the Speaker



Dr. Ernesto O. Brown is the Director of SERD-PCAARRD. He holds a PhD in Agricultural Economics from the University of the Philippines Los Banos. His fields of specialization include Agricultural Policy, Agricultural Marketing, and Project Evaluation and Management. Dr. Brown is the former president of the Philippine Agricultural Economics and Development Association. He has done numerous works on agricultural value chains and supply chains, impact assessment, and agricultural policy analysis. He has also served as a consultant to local and international organizations such as the Food and Agriculture Organization (FAO), the United States Department of Agriculture (USDA), the United States Agency for International Development (USAID), the United Nation Development Program (UNDP) and the World Fish Center (WFC), among others.

Dr. Ernesto O. Brown

Socio-Economics Research Division
(SERD) Director
DOST-PCAARRD



Polisiya at Siyensya: Gabay sa Matatag na Food Security System

Rebuilding the Farm-to-fork Model: A Resilient Agricultural Food Supply Chain

The Covid-19 pandemic has emphasized the need for resiliency for the AANR sector, which can be achieved through an enabling policy environment. It is in this context by which a policy framework for a resilient agricultural food supply chain is developed. This framework highlights new threats and emerging opportunities, as a result of the pandemic, and presents possible R&D areas to pursue across the different nodes of the supply chain—from production to processing and distribution to retail. It illustrates the key principles as a guide to making the food value chains agile such that they would withstand, immediately recover from, and adjust or adapt to such disruptions.

Development of Smart Food Value Chain (SFVC) Models for Selected Agricultural Products

In the development of smart food value chains, the new normal and pre-existing threats and opportunities to value chains are being analyzed and the necessary intervention models are being developed to accelerate local food production and generate market opportunities. It will leverage the existing smart technologies already developed by various DOST agencies and fill in the gaps to develop a smart and resilient food supply chain.

Enhancing the Agri-Aqua Food Value Chain through Smart Technologies

This project aims to accelerate the transfer and promotion of technologies focusing on community-based food production enterprises through the enhancement of the operations of Agri-Aqua Technology Business Incubators or ATBIs towards food resiliency in the new normal.

Development of Inclusive and Resilient S&T-based Vegetable Supply Chains for the New Normal

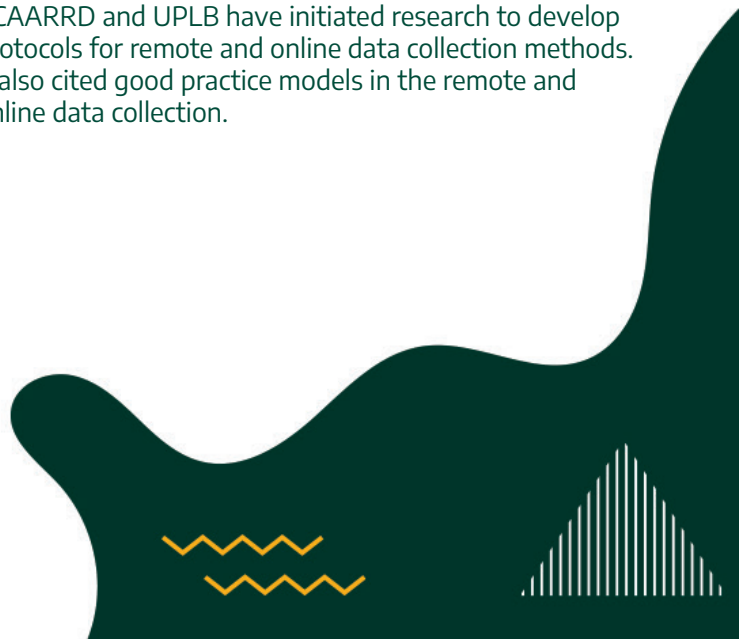
DOST-PCAARRD also supports the development of resilient local supply chains for vegetables that can operate in both lockdown and post-lockdown scenarios. This project aims to establish a reliable production base, compliant with food safety and handling, and supply chain management system software solutions. This is currently being pilot-tested in Los Banos, Laguna, and will be replicated in other areas in the future.

Establishment of Agri-Aqua Business Hub (AABH)

DOST-PCAARRD recently established the Agri-Aqua Business Hub to realize the agribusiness potentials of our R&D outputs to generate impacts. The Hub serves as a frontline service supporting the development and operation of agri-aqua enterprises. Clients are being supported through training and mentoring and by providing access to technologies, markets, inputs, and services like finance, in ways that are commercially viable.

Development of Socio-Economics Research Remote Data Collection Protocols Under the New Normal

The conduct of social science research has also been disrupted by the pandemic, halting movements in the field. In recognition of researchers' need for a guide in the use of remote and online surveys and FGDs, DOST-PCAARRD and UPLB have initiated research to develop protocols for remote and online data collection methods. It also cited good practice models in the remote and online data collection.





About the Speaker



Dr. Leila C. America
Forestry and Environment Research
Division (FERD) Director
DOST-PCAARRD

Dr. Leila C. America was the former Director of FERD of DOST-PCAARRD.

With her master's in wildlife studies and PhD in forestry, she demonstrated exemplary work in the field of forestry and environment. She is very hands-on in assisting collaborators and partners. Through her initiatives in managing and coordinating R&D activities, strong collaborations and partnerships were formed between various government agencies and State Universities and Colleges (SUCs).

She served the council for over 40 years with excellent leadership skills and has been instrumental in the establishment of the following R&D centers:

- Biodiversity R&D Center based in Cebu Technological University-Argao campus;
- Cacao R&D Center based in University of Southern Mindanao;
- Bamboo R&D center based in Central Mindanao University;
- Industrial Tree Plantation Innovative Center based in Caraga State University; and
- Caves R&D center in the UPLB Museum of Natural History (UPLB-MNH).



Managing Biodiversity for Intergenerational Equity



Flora and Fauna Assessment Using Permanent Biodiversity Monitoring System (PBMS) in Cebu Island Key Biodiversity Areas

This project generally aims to assess flora & faunal diversity, habitat types and composition of KBAs of Cebu through Permanent Biodiversity Monitoring System (PBMS) and to develop a plant and animal database for proper management and for strengthening conservation efforts.

Natural fungicide from *Tasmannia piperita*

The research team from Central Mindanao University (CMU) screened 10 potential indigenous plants from Mindanao, using different plant parts as biopesticide. It was found out that leaves of *T. piperita* can prevent leaf spot disease of lettuce caused by *Alternaria brassicae* and late blight disease of tomato caused by *Phytophthora infestans*.

Biodiversity in Selected Mountain Ecosystems of Mindanao for Conservation and Sustainable Development

This research provides an avenue to explore the different ecosystems in a landscape approach, using biodiversity and forest condition assessments as basis. Among the significant accomplishments of the project is the discovery of new species and new species records for both flora and fauna in Mindanao.







About the Speaker

Dr. Juanito T. Batalon, an agricultural and biosystems engineer, is currently the director of the ARMRD, PCAARRD. A committed and dedicated public servant, Dr. Batalon has spent 31 years of his life in the area of research management. He became the Officer-in-Charge of the Office of the Deputy Executive Director for Research and Development of PCAARRD in November 2019 for 15 months, and had led different technical divisions of the Council in managing various R&D programs and projects in the AANR.



Dr. Juanito T. Batalon

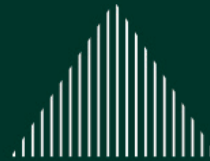
Agricultural Resources Management
Research Division (ARMRD) Director
DOST-PCAARRD



GALING-PCAARRD Kontra COVID-19

As a quick response to the government-led efforts against the COVID-19 pandemic, DOST-PCAARRD launched the GALING-PCAARRD Kontra COVID-19 Program. Component 3 of the program, 'Pagkain at Kabuhayan sa Pamayanan' supports the various food production and livelihood projects such as 'Gulayan sa Pamayanan,' 'Tilapia para sa Pamayanan,' and mangrove crab fattening and seaweed farming to hasten the impact of the pandemic to the households and communities. The R&D for sustainable livelihoods highlights DOST-PCAARRD efforts to assist the AANR sector all over the country using S&T based technologies.

DOST-PCAARRD Quick Response Projects (QRP) helped at least 122 communities, and trained 1,200 individuals in S&T based livelihood to alleviate community situation during and beyond COVID-19 pandemic. Since 2017 the DOST-PCAARRD support the use and commercialization of mature technologies in the AANR sector by establishing and developing viable agribusinesses through incubation and acceleration. The National Agri-Aqua Technology Business Incubation (ATBI) Program was able to establish and operationalize 16 ATBIs across the country with a total of ~P160.4 million (M) investment, 9 is situated in Luzon, 3 are in Visayas, and 4 are in Mindanao.





About the Speaker



Dr. Synan S. Baguio
Livestock Research Division
(LRD) Director
DOST-PCAARRD

For more than 38 years, Dr. Synan S. Baguio has devoted himself in building a career in livestock and poultry R&D management with LRD of the DOST-PCAARRD. Through these years, he engages himself in planning, monitoring and evaluation of government as well as internationally funded R&D programs and projects in commercial hybrid swine, native pigs, native chickens, native ducks, dairy buffaloes, cattle and goats and recently in beef cattle. As a technical person, he engages himself in packaging R&D program proposals and in packaging and dissemination of S&T-based information and technologies in livestock and poultry. Moreover, he also serves as resource person in local and international seminar-workshops and trainings on science-based livestock and poultry production and animal industries development. He also serves as resource person in radio and TV programs that promote technologies on livestock and poultry production.

As a government research manager, he is keen on ensuring that concrete social, economic and cultural benefits are gained from every peso invested in R&D. Moreover, he asserts human resource capability building and R&D facilities enhancement as among his priorities. Thus, he actively engages himself in mentoring young and budding R&D managers of the LRD, DOST-PCAARRD and of young researchers and budding scientists of private and government institutions that are members of the national R&D network in agriculture. Also, he sits either as chair or member of inter-agency committees dedicated to promoting the science behind livestock and poultry production. He keeps his active membership in professional organizations in animal science and in agriculture. He is a member of the World Poultry Science Association (WPSA). He also served as president of the Philippine Society of Animal Science (PSAS) from November 2019 to December 2021.

Doc Synan, as he is fondly called by his friends and colleagues, holds a Doctor of Philosophy degree in Animal Science (major in Animal Physiology) from UPLB, a Master of Science in Animal Science from the University of Melbourne, Parkville, Victoria, Australia and a Bachelor of Science in Agriculture (major in Animal Husbandry) degree from the Silliman University, Dumaguete City.



Securing Safe and Sufficient Food Supply thru S&T

3. A mindset that is centered on the health benefits of organic vegetables
4. Partnerships between farmers and LGU's in promoting organic vegetable production
5. Sustained organic agriculture R&D activities and
6. Premium prices for organic products.

African Swine Fever virus (ASFv) Nanogold Biosensor

ASFv Nanogold Biosensor is a quick test kit that shows more than 90% detection efficiency of ASFv DNA. The kit detects the presence of the virus in feeds, water and on contaminated surfaces at an estimated cost of P300 per reaction, which is way below the cost of standard laboratory PCR test. Moreover, it is easy to use, thus it can be used by anyone in the field and it produces results within 45 minutes compared to the 3 days or more turn around period with standard laboratory diagnosis.

Mussel Depuration

Depuration is the process of eliminating or reducing bacterial load in mussels by keeping live harvested mussels in treated seawater using a recirculating or a flow-through system. This technique allows the mussels to self-purify and expel ingested bacteria.

This mussel depuration technology does not only ensure freshness and quality of mussels, it also ensures compliance to health and safety requirements of mussels made available to the consuming public.

Organic Agriculture

The organic agriculture technology is guided by an organic farm framework that covers 1) varietal evaluation and organic seed production, 2) organic and microbial fertilizer production, 3) development of biopesticides and biocontrol systems and 4) value chain analysis and policy advocacy towards promotion of organic vegetable production.

Based on initial results of an impact assessment study, among the success drivers of organic vegetable production are:

1. Prior engagement of farmers in organic agriculture
2. Organic vegetable farming as the main source of income





About the Speakers



Dr. Ricardo Jose Guerrero

Research Fellow

Ateneo Research Institute for Science
and Engineering (ARISE)

Ateneo de Manila University (ADMU)

Ricardo Jose Sta. Maria Guerrero works as a Research Fellow at ARISE, where he lead the project on microfluidic PCR (miPCR), which is a component project of the AMPLiFieD system that aims for an expanded near-point-of-care testing for COVID-19.

He is a post-viva doctoral candidate of the University of Edinburgh in United Kingdom and has extensive experience in the field of bioengineering research.

He also worked for notable academic institutions abroad, including the Massachusetts Institute of Technology (MIT), University of Waterloo, and Japan National Institute for Material Science.



Marie Jennifer Reolo

Research Fellow

Ateneo Research Institute for Science
and Engineering (ARISE)

Ateneo de Manila University (ADMU)

Marie Jennifer Reolo is a Biomedical Translational Researcher who started her career on drug discovery for acquired sensorineural hearing loss.

After graduating from the National University of Singapore, she focused on nuclear medicine to develop *in vivo* molecular imaging agents that non-invasively study cancer. Her interests are immunotherapy for glioblastoma multiforme and tropical infectious diseases.

She obtained an MSc in Biological and Biomolecular Science from the University College Dublin, where she studied neuroinflammation in Alzheimer's Disease and gained valuable expertise in *in vitro* diagnostics to address health inequality.

Shortly after graduating, she moved back to the Philippines to contribute in providing knowledge and expertise to the COVID-19 diagnostic efforts in the country.

Currently, she is a Research Fellow at ARISE, where she leads two DOST-PCHRD-funded projects: SWIFTeR and SPECIFieD.

She is also part of the Bayan Biomedical Research Group, the team behind AMPLiFieD projects—miPCR, SWIFTeR, and ADDS—for an expanded near-point-of-care COVID-19 testing.



AMPLiFieD System: Faster, Cheaper, and Simpler COVID-19 Testing

The Bayan Biomedical Research Group of ARISE conducts the AMPLiFieD system project to develop expanded near-point-of-care testing for COVID-19. The system combines three projects: the miPCR, ADDS, and SWIFTeR projects.

Microfluidic PCR Device (miPCR)

To provide a functional alternative to the typical PCR device used in COVID-19 testing, the Bayan Biomedical Research Group developed a smaller and more compact instrument called the miPCR, which is at least five times cheaper than other PCR devices in the market. The smaller and more compact device will enable testing closer to the patients' point-of-care by reaching even community clinics with limited budgets and capacities.

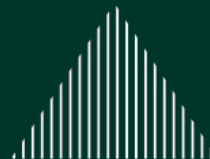
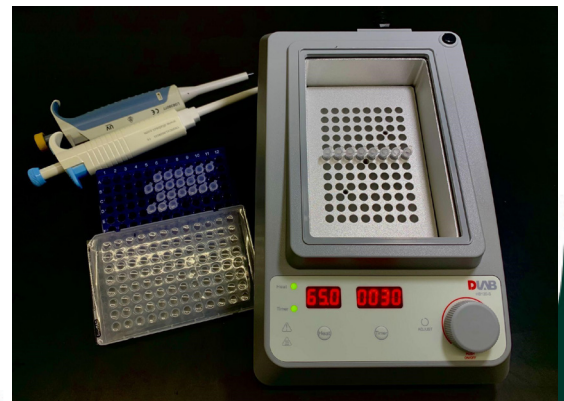
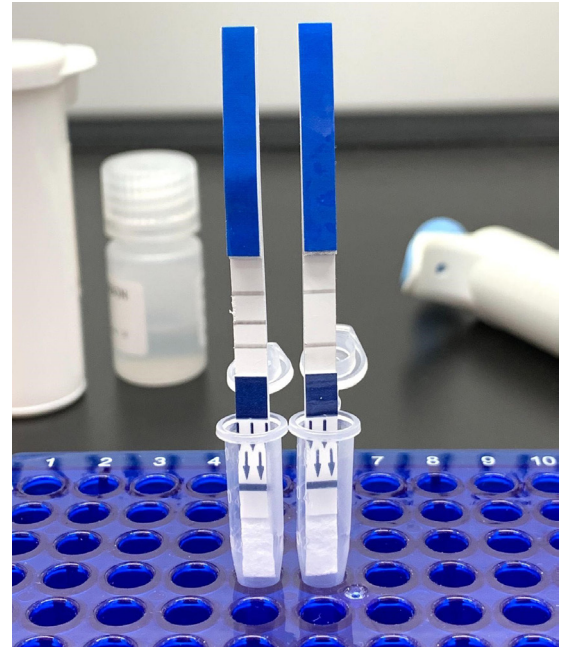
AMPLiFieD DNA Detection System (ADDS)

The ADDS project aims to simplify the gold standard RT-PCR testing by using saliva samples instead of nasal swabs. This enables conventional thermocyclers to be used with a simple lateral flow test strip as the readout, thus increasing access for COVID-19 testing. The ADDS kit can work with different PCR instruments like the miPCR for a scaled and distributed testing.

SWIFTeR

SWIFTeR validates a time-efficient and cost-effective testing using saliva, which will allow for a faster turnaround time of COVID-19 test results. By using the technology called LAMP, results can be released to the patients within one hour. The project team also aims to calibrate the technology to process multiple samples in a single run, which will help ease the bottleneck in COVID-19 testing.

Through the AMPLiFieD system, even wider deployment of COVID-19 testing will be made available in the country for more responsive testing and tracing of suspected COVID-19 cases. If successful, this will jumpstart a faster, cheaper, and simpler testing protocol and platform for COVID-19 and other diseases in the coming years.





About the Speaker

Dr. Imelda Angeles-Agdeppa is a seasoned Researcher and Scientist in the field of nutrition. She currently serves as the Director of DOST-FNRI.

She obtained her BS Food and Nutrition from the University of Pangasinan, where she graduated cum laude. She also earned her Masters and Doctorate Degree in Community Nutrition from the University of Indonesia in Jakarta.

Dr. Angeles-Agdeppa conducted numerous community trials and researches that were translated into laws and policies, which contributed significantly to the improvement in the nutritional status of Filipinos. Her latest research titled, “Beneficial Effects of Virgin Coconut Oil (VCO) Among Suspect and Probable Cases of COVID-19,” which if proven successful, will allow VCO to be used as an adjunctive therapy that could prevent severe cases of COVID-19.



Dr. Imelda Angeles-Agdeppa
Director IV and Scientist II
DOST-Food and Nutrition Research
Institute (FNRI)



The Beneficial Effects of Virgin Coconut Oil Among Suspect and Probable Cases of COVID-19

The project aims to evaluate the beneficial effects of VCO given to suspect and probable cases of COVID-19 who are quarantined in a center or hospital. After conducting a clinical trial in Sta. Rosa City, Laguna, the study revealed that the meals mixed with VCO could reduce COVID-19 symptoms, thus, possibly preventing the progression or severity of the disease.

Once the sequel R&D are completed, results from these studies will be the basis for recommending VCO as an adjunctive therapy that could prevent COVID-19 from becoming severe.

Aside from this, the project could potentially boost the coconut industry and eventually, the country's economy.

The study was made successful due to the support and collaboration of DOST-FNRI, DOST-Philippine Council for Health Research and Development (PCHRD), DA-Philippine Coconut Authority (PCA), DOST CALABARZON, City of Santa Rosa, Laguna, and ADMU.





About the Speaker



Dr. Delia B. Senoro

Director

Office of International Linkages
for Research and Development
Mapua University

Dr. Delia B. Senoro is an established researcher in the field of environmental engineering and health risk assessment. She received a post-doctoral training on environmental quality assessment, remediation, education for sustainable development and health risk assessment from international institutions, such as the National Cheng Kung University, Chia Nan University of Pharmacy and Science, Institute of Environmental Medicine in Karolinska Institute, and Stockholm Resiliency Center in Stockholm University, among others.

With her expertise, she established the Office of International Linkages for Research and Development of the Mapua University and has served as its Director since 2012. She also contributed in the establishment of the Taiwan-Philippine Water Quality Research and Innovation Center, Resiliency and Sustainable Development Center, and the BEEHIVE Accelerator Center.

Currently, she leads the projects focusing on the development of local vulnerability indices under the VAPERS project and health vulnerability indices (HVIs) for LGUs under the Development of Health Index and Vulnerability Reduction System for Region IV-B (D-HIVE 4B project).

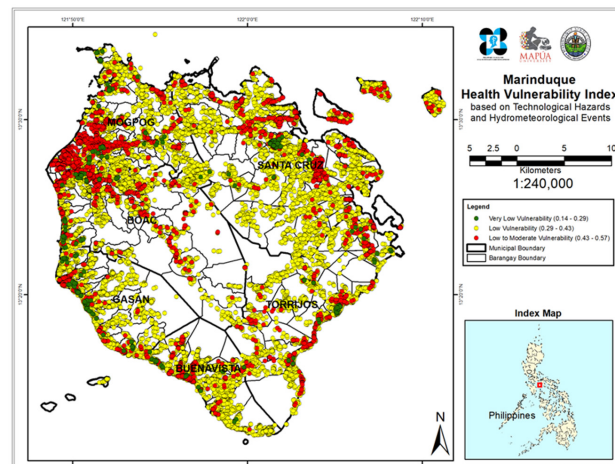
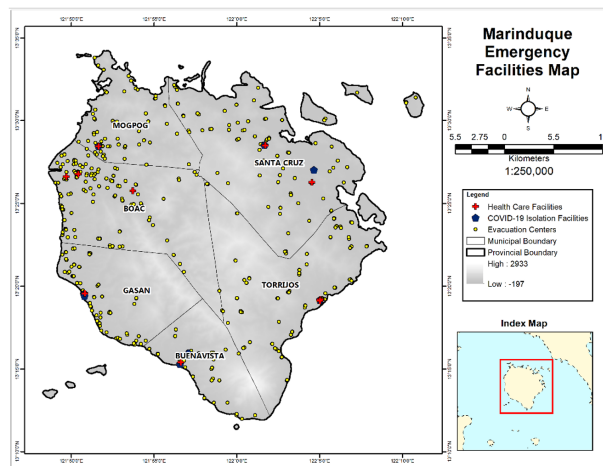


Development of Health Index and Vulnerability Reduction System for Region IV-B Project

The D-HIVE 4B project works closely with LGUs in MIMAROPA. This is to develop an eSalba system that hosts HVIs and functions as early warning tools to support disaster preparedness and resiliency in the region. The eSalba is a web-based monitoring and emergency response application.

The HVIs illustrate the environmental quality and health hazards in MIMAROPA cities and municipalities. With this data, LGUs are guided in formulating efficient disaster preparedness and response programs, as well as environmental policies to lessen the impact of unprecedented natural and anthropogenic disasters.

D-HIVE 4B also enables improved emergency response through eSalba. The application allows access to the HVIs and information of spatial distribution of environmental quality through a mobile phone. It functions as a communication tool for emergency response, as well as a platform for self-reporting of health hazards and tracking locations of reporters, responders, health facilities, and evacuation centers.





About the Speaker



Dr. Elizabeth Hashim-Arenas

Associate Professor of Food Science
University of Santo Tomas (UST)

Dr. Elizabeth Hashim-Arenas is an Associate Professor of Food Science at UST. She is a proud member of the Philippine Association of Food Technologists, Inc. and an associate member of the National Research Council of the Philippines.

Dr. Elizabeth Arenas obtained her BS in Food Technology from UST, where she graduated cum laude. She conducted her post-graduate studies in the University of the Philippines Diliman where she earned her Master's Degree in Food Science, and came back to UST for her Doctorate Degree in Biological Science where she graduated magna cum laude.

She has published and presented her research papers locally and abroad. At present, she is working on the development of a ready-to-drink Pili Pomace Tea.



Development of Ready-to-Drink Pili (*Canarium ovatum*, Engl.) Pomace Tea

Geared towards fully utilizing the Pili fruit including its defatted pulp and peel, which is considered as an agricultural residue, the project aims to develop ready-to-drink beverages made from brewed pili pulp. Preliminary tests demonstrated that the antioxidant activity of Pili Tea is at par with commercially-available ready-to-drink tea beverages, while some brands are inferior compared to Pili Pomace Tea. These results indicate that Pili Pomace Tea is a potential source of dietary antioxidants that may promote good health and well-being.

The development and commercialization of value-added food products from this agro-food residue will unfold new economic opportunities to the farmers and Small and medium-sized enterprises (SMEs), thereby contributing to the sustainability of the local Pili industry and providing positive impact to food security.

Ultimately, the production of this ready-to-drink Pili Tea will open the possibilities of creating even more products from Pili Tree.





About the Speaker

Dr. Michelle Cristine Miranda is an alumna of UP. She graduated magna cum laude in BS Psychology in UP Diliman and finished her medical degree at the UP College of Medicine (UPCM). She recently fulfilled her residency training in Pediatrics at the Philippine General Hospital.

Her current academic endeavors involve the field of vaccine economics research and “The E-Steth Project,” the latter as one of the flagship projects under UPCM Surgical and Biotechnology Innovation Laboratory (SIBOL) Program.

In her free time, she is an artist specializing in portraiture.



Dr. Michelle Cristine B. Miranda
Medical Officer III
UP-Philippine General Hospital (PGH)



“E-Steth”: Locally-developed Electronic Stethoscope

Realizing that there is a risk for healthcare workers to be infected with COVID-19 when checking for a patient’s vital signs, the team developed E-steth, a stethoscope that will enable medical frontliners to listen to a patient’s breathing sounds at a safe distance. E-steth has the following features:

- has a main electronic component that is enclosed in an easy-to-use and plug-and-play device with minimal difference from using a conventional stethoscope.
- can operate as both a conventional stethoscope and an electronic one.
- allows convenient shifting between the new electronic technology and to the conventional mode they are more accustomed to in one complete package.

Once completed, the E-Steth will benefit healthcare workers that routinely checks the breathing of COVID-19 suspect and confirmed patients as well as referral hospitals where COVID-19 patients are being admitted.





About the Speaker



Dr. Catherine S. Co
Clinical Associate Professor of Surgery
UP-PGH

Dr. Catherine S. Co has her subspecialty training in the Fellowship in Colon and Rectal Surgery, UP-Philippine General Hospital and her subspecialty trainings on minimally invasive surgery and Robotic surgery at the National University Hospital, Singapore; Pamela Youde Nethersole Eastern Hospital, Hong Kong; Robotic Surgery-Prince of Wales Hospital-Chinese University of Hong Kong; and Jockey Club Minimally Invasive Surgical Skills Centre, Hong Kong.

Her special interests include laparoscopic and robotic colorectal surgery, endoscopy, and endoanal and endorectal ultrasound.

CleanIntubate

Patients with confirmed cases who develop severe or critical pneumonia would require airway-related procedures such as Tracheal Intubation. Laryngoscope is a medical device used for intubation. It is a semi-critical item that requires high-level disinfection using chemical disinfectants.

The tedious manual cleaning and disinfection involves a significant amount of handling through the different solutions. However, there is a possibility that it might lead to tears in the surgical gloves, possible spills and splashes and contact with the detergent and disinfecting solutions. With this, we realized that there is an increasing need to develop medical devices that will help healthcare workers and lessen the burden of exposure and possible risks of manual laryngoscope blade disinfection process.

Our team aimed to design and fabricate portable and non-portable large-scale laryngoscope blade disinfecting devices, that will make the standard process of cleansing and disinfection of laryngoscope blades safer and faster for the medical personnels. We call it CleanIntubate. Even after the pandemic, CleanIntubate will still be applicable and helpful for medical personnels, especially for anesthesiologists performing intubation procedures.





About the Speaker

Dr. Samuel Arsenio M. Grozman is a General Surgeon in Ayala Alabang, Muntinlupa. He practices at Asian Hospital and Medical Center in Ayala Alabang, Muntinlupa.

He completed his PhD in Medicine from UP. Some of the services provided by the doctor are: Liver Transplant, Pancreas transplantation, Cardio Thoracic Surgery, Bone Marrow Transplant and Reconstructive, and Microvascular Surgery.



Dr. Samuel Arsenio M. Grozman
Assistant Chair for Undergraduate
Training & Education
UP Manila

Air-purifying Respirator for Healthcare Workers (HCWs)

While COVID-19 causes death to infected patients, it is also highly contagious to those who care for them. The use of PPEs is one of the appropriate strategies to prevent infection among HCWs.

One type of PPE is a powered, air-purifying respirator or PAPR which can be used for high-risk procedures by a healthcare worker at risk from aerosol or droplet spread. It uses a pump that moves contaminated air through a high-efficiency particulate filter. The contaminant-free air is then channeled to the faceplate of the wearer, and is breathed in by the HCW.

SIBOL's PAPR will be an innovative version of commercially available one, as it will provide an additional type of protection for healthcare workers, aside from wearing the recommended and common PPE. It primarily benefits healthcare workers in COVID referral centers, as well as laboratory technicians, and possibly to the military, policemen, and firemen in the frontlines.



About the Speaker



Dr. Edward H.M. Wang
Program Leader
SIBOL-COVID Task Force

Dr. Edward H.M. Wang was recognized for his significant contributions as a researcher, clinician, mentor, and scientist, specifically, for his extensive research in musculoskeletal tumor in the Philippines and for establishing that life-saving treatment and limb saving are possible in a state-subsidized government hospital for bone and tissue cancers of the limbs. His excellent collection of data of about 3000 cases on the musculoskeletal tumor patients at the Philippine General Hospital of the University of the Philippines Manila resulted in better patient service and allowed for further study and understanding of these conditions. This has served as the backbone of many research studies in terms of demographics, treatment results, and survival rates. He spearheaded the establishment of a multidisciplinary unit known as the UP-MuST Unit (University of the Philippines Musculoskeletal Tumor Unit) for optimum medical management, including medical and pediatric oncology, pathology, radiation oncology which serves as model for others to emulate locally and internationally. Dr. Wang and his team have directed their scientific work to optimizing treatment for the Filipino patient, addressing different concerns and situations unique to the Philippines.

Sanipod Disinfection Cubicles

The virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. This puts healthcare workers at high risk of infection.

One way to mitigate this is through the use of disinfection to decrease the chance of spreading the virus to people and objects within the hospital premises.

SaniPod is made to address this challenge. The technology is a self-containing cubicle that aims to provide low level disinfection for healthcare workers as they enter and leave a hospital area. SaniPod is a cost-effective, self-containing and low-level disinfection cubicle. It will be beneficial in the areas such as the triage area and entrances or exits of rooms and wards where COVID-19 patients are being managed.

Aside from wearing PPE, disinfection cubicles such as SaniPod will ensure that medical personnel are given an extra layer of protection from COVID-19, as SaniPod cubicles are more efficient than the existing sanitation tents in terms of disinfection success. It can also provide psychological assurance to healthcare workers, and a means of disinfection for Filipinos if placed in highly dense areas where a lot of people congregate such as public markets.





About the Speaker



Dr. Geohari Hamoy
Senior Lecturer
UP Manila

Dr. Hamoy, currently a Senior Lecturer at the UP Community Health and Development Program in University of the Philippines Manila. He is also the current Chief Operating Officer of Pivotal Peak Digital Health Solutions, a spin-off company of UP Manila registered with the Securities and Exchange Commission in 2019. He studied Doctor of Medicine and obtained his Masters degree in Public Health from UP, where he also served as a faculty member.

Telemetry System for COVID-19

Part of SIBOL's telemonitoring initiatives is the development of a telemetry system that helps healthcare workers in remotely monitoring COVID-19 patients through RxBox. RxBox is a biomedical device capable of measuring a patient's temperature, blood pressure, heart rate, oxygen saturation, uterine contractions, and electrocardiogram readings.

It is developed to diagnose using sensors attached to a computer box, sending data wirelessly to a remote medical professional for interpretation. This project aimed to utilize the RxBox by developing telemetry units, which will facilitate the transfer and further improve the readings of RxBox that are tailored to the requirements in medical wards.

Through this project, RxBox will be optimized with telemetry features that will enable nurses to remotely monitor patients from a dashboard which also has a telereferral functionality, where electronic data are transferred to a different health facility.





About the Speaker



Dr. Nathaniel S. Orillaza, Jr.
Associate Professor of Orthopedics
UP Manila

Dr. Orillaza is a hand surgeon and Associate Professor of Orthopedics at the University of the Philippines Manila. He currently serves as the president of the Association of Hand Surgeons of the Philippines and sits as a trustee and secretary of the Philippine Board of Orthopedics. He spends significant hours of service providing care for the underserved in several government hospitals and assisting orthopedic surgeons in-training. He has published papers focusing on upper extremity care, orthopedic research and patient education and involvement in care, while working as editorial board member of international journals.

Telepresence Device with a Friendly Face

When admitted in hospitals, COVID-19 patients are isolated to avoid contamination and conserve PPE. This limited human contact is deemed to add to the anxiety of patients. The project's objective is to develop a device that limits exposure, conserves PPE, and provides clear communication with a friendly face.

This is the telepresence device: a telemonitoring technology that: serves as proxy for health care workers in high exposure areas of hospitals, provides personalized care to the ill, while protecting nurses and doctors from contamination, and answers calls from authorized accounts using available teleconferencing and remote-control applications.

Telepresence devices not only help nurses and doctors, anxious and lonely patients isolated from their families and friends can also remotely communicate with their loved ones during their fight to survive the disease.





About the Speaker



Dr. Aristotle T. Ubando




Full Professor and Research Fellow
Mechanical Engineering Department-
DLSU

Dr. Aristotle T. Ubando is a Full Professor and Research Fellow at the Mechanical Engineering Department, DLSU. He is the head of the Thermomechanical Analysis Laboratory at DLSU-Laguna Campus and the current Chairman of the Mechanical Engineering Department.

He has published more than 145 Scopus-indexed journal papers in the national and international level with an h-index of 16.

In 2017, he was selected as one of the 2017 Asian Scientist 100 for his contribution in the sustainability field. He was awarded the 2016 Outstanding Young Scientist by NAST and 2020 Achievement Award for his contribution in the Engineering Division of NRCP.

His research includes finite element analysis, computational fluid dynamics, process integration and optimization, and energy system modelling.



Finite Element Analysis (FEA) of Semiconductor Packages

The project uses FEA coupled with experimentation to observe the thermomechanical properties and behavior of materials used in semiconductor package manufacturing, as well as effectively design packages to protect the semiconductor devices.

The semiconductor and electronics industry captures almost half of the Philippines' total export share in 2016 at USD 28.8 billion (B) (The Philippine Star, 2017). As the demand for electronic devices increases, the growth for the development, design, and manufacturing of semiconductor packaging devices is projected to grow.

The challenge is to ensure design soundness of the packaging device in terms of form and functionality under thermal load conditions. Thermomechanical analysis approach offers a cost-effective and time efficient methodology in evaluating the soundness of the packaging design.

This project continues to fill the research gap in understanding the thermomechanical behavior of the semiconductor materials and packages, while building the capacity and capability of the Thermomechanical Analysis Laboratory (TALa) in DLSU Laguna.

Data from the simulations and experiments will enable the industry to further improve the physical configuration of electronic packages prior to its full production and play a vital role in their business, ensuring sound design for semiconductor packaging devices.





About the Speaker



**Dr. Ma. Louise Antonette N. De
Las Peñas**
Professor
ADMU

Ma. Louise Antonette N. De Las Peñas is a Professor of Mathematics at the Department of Mathematics, ADMU.

Her research areas are Group Theory, Discrete Geometry, Mathematical Crystallography, and Technology in Mathematics Education. She heads three research labs based in the School of Science and Engineering where she supervises doctoral and postdoctoral students, and works on government funded projects, such as Symmetries in Algebra and Geometry Lab, Mathplus Resources Lab, and the Mathematics in Art, and Culture and Creativity Lab.

Among her current research projects involve the creation and dissemination of mathematical resources and technology applications to support online and blended learning in Grades 1 to 11 during the pandemic and the mathematical analysis of Philippine baskets.

Her numerous projects on methods of analysis of Philippine cultural heritage resulted in several consultancies with Philippine museums and national cultural agencies.

Moreover, Dr. De Las Peñas enabled the empowerment and support for Philippine women weavers and artists through her work on the Mathematics of Philippine Indigenous Artwork.

During her break from her hectic schedule, Dr. De Las Peñas spends time travelling and watching movies. She is also a food who loves experimenting on different exotic cuisine.



Mathplus Apps for Blended Learning

This project aims to create a framework for a digital mathematics learning environment for implementation in Philippine schools. It includes the development of freely available mathematical applications (apps) that can respond to the urgent educational adaptations driven by the COVID-19 pandemic. The apps are aligned with the most essential learning competencies of the official Grade 1-11 mathematics curriculum issued by DepEd. It focuses on the strands: number, measurement, geometry, probability, and statistics. These are research-based and are not mere electronic versions of textbooks or worksheets whose primary function is to provide drill and practice. Rather, the apps are designed to promote mathematical reasoning and visual thinking so that the Filipino children can learn to think by and for themselves.

The apps promote the following: visualization of abstract concepts, structural thinking, development of number sense, estimation skills and computational capabilities, exploration, use of real data, and mathematical modeling. The apps are designed to be used by students with limited supervision from parents or teachers, thus are suited for asynchronous learning.

The project has forged partnerships with several DepEd divisions, which aim to bring the resources to the stakeholders through Internet and community long term evolution (LTE) networks.





Dr. Maria Aileen Leah G. Guzman
Associate Professor/Chairperson
ADMU

Philippine Groundwater Outlook (PhiGO)

PHIGO aims to deliver constant, consistent, accessible and transferable assessment of climate, population and land use change on regional groundwater resources and their subsequent influence on flood, drought-risks and socio-economics. The project intends to carry out its main objective by developing, near-real time groundwater monitoring systems (show the monitoring wells and the UK & Phil Sensors), enhancing models of regional groundwater dynamics, providing seasonal and long-term forecasts of groundwater levels and delivering stakeholder-focused reports of flood and drought risk and cascading hydrological and socio-economic impacts (show the models from BGS). The project focuses on 2 sites (show the 2 sites or a map of the sites—can be from the website), namely the provinces of Iloilo and Pampanga. Both provinces are among those identified in the 1990s as water critical areas.

The near-real time information on groundwater quantity and quality as well as the seasonal and long-term forecasts from the enhanced regional groundwater models can be used by stakeholders to come-up with policies, plans and programs that are tailor fitted for each area that will allow water resources to be managed in a sustainable manner that addresses the unique needs and characteristics of different regions, provinces in the country. At the same time, it allows citizens to find out the current state of groundwater in their locality.





PCIEERD Young Innovators Program (YIP)

YIP provides support to students under the age of 25 to conduct their own scientific research projects. This is to motivate them to pursue a career in S&T and eventually contribute to the expansion of the country's research pool, thus increasing chances of discovering breakthroughs and solutions to the country's socio-economic problems.

The program aims to train and prepare young researchers to conduct independent research, as well as inspire them to become the country's next generation of engineers, researchers, and scientists.

YIP is committed to enhance the credibility of scientific research in the country by supporting and strengthening the abilities of the youth to do great things, while mobilizing the agency's efforts to help them enjoy scientific research.



Dr. Ruby Raterta

Chief Science Research Specialist Human
Resource and Institution Development
Division-PCIEERD





Understanding Lightning and Thunderstorms (ULAT) Project



Jerico Orejudos

Science Research Specialist I
DOST-Advanced Science and Technology
Institute (ASTI)

ULAT Project is a collaborative project among DOST-ASTI, DOST-PAGASA, and UP-Institute of Environmental Science and Meteorology (IESM) with technical cooperation of Hokkaido University, Japan International Cooperation Agency (JICA), and Japan Science and Technology Agency (JST) through the Science and Technology Research Partnership for Sustainable Development (SATREPS) program. This aims to leverage weather and lightning data by observing extreme weather events to further improve weather forecasts.

ULAT's initiatives can help the lives of the Filipino people by providing real-time localized weather data to LGUs, stakeholders, and other related agencies. This may assist the disaster risk reduction units and LGUs in developing effective plans to strengthen the country's resiliency against weather calamities.

With real-time weather and forecast data, the responsiveness of LGUs to calamities can improve, which might result in quicker evacuation of citizens from affected areas and minimal losses to agriculture and infrastructure. Stakeholders and business owners can also make data-driven decisions that can save resources affected by calamities.





About the Speaker



Dr. Maricor N. Soriano

Program Leader

Space Technology & Applications
Mastery, Innovation and
Advancement (STAMINA4Space)
Program

Dr. Maricor Soriano is a Professor of Physics at UP who specializes in developing hardware and software tools for video and image processing. Her work spans multidisciplinary domains, such as coral reef imaging (for which she won the PCIEERD R&D prize in 2018), cultural heritage conservation, video analysis of sports, and medical imaging.

She was NRCP Outstanding Young Scientist in 2006, Third World Academy of Science Physics Prize recipient in 2009, and the Outstanding Women in the Nation's Service (TOWNS) awardee in applied physics in 2013.

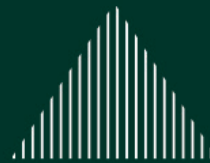
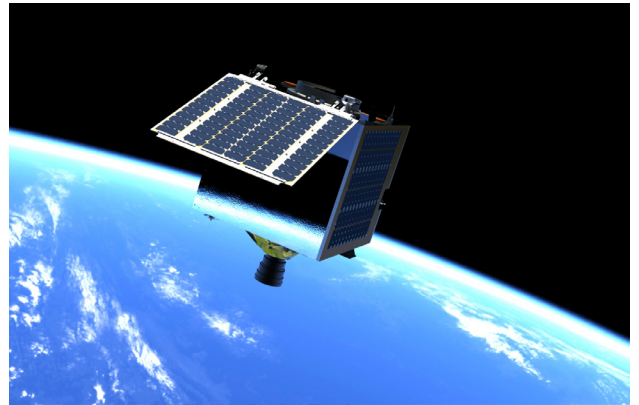
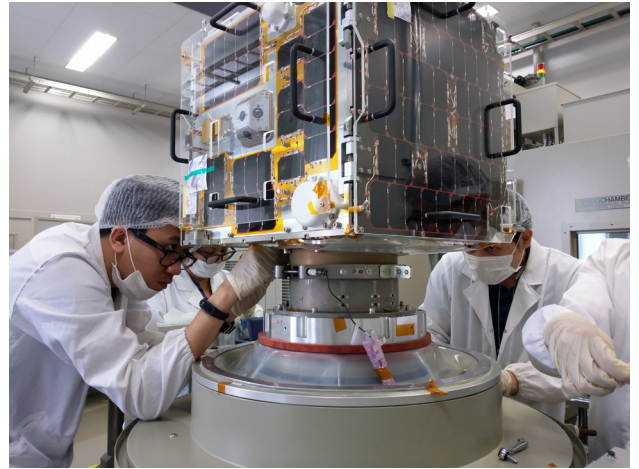


Scaling New Heights: Bringing Filipinos to Higher Ground with Space R&D

The STAMINA4Space Program focuses on the advancement of local expertise in space technology and applications (STA) to spur the development of high-value industries in the country, and to address our manifold needs in scientific earth observation for disaster risk reduction and management, resource assessment, environmental monitoring, and other applications.

STAMINA4Space uses small satellite technology as a platform for:

- Generating valuable data from scientific earth observation;
- Building an industrial base for innovations in aerospace technology and affiliated sectors;
- Creating an enabling environment for interdisciplinary R&D; and
- Developing scientists and engineers that work together to tackle high-impact, societal-scale challenges for the country.





About the Speaker



Engr. Fabor Tan
Professor
Mapua University

Engineer Fabor Tan is a professor of Civil and Environmental Engineering at the Mapua University-Manila. He is the project leader of several DOST-PCIEERD-funded projects of Mapua including the FRAMER, ARMS, and SCARP Projects.

He also contributed in the Mapua-Phil LiDAR 1 Project as the former Chief Science Research Specialist.

He finished his BS Civil Engineering and MS in Environmental Engineering at UPD and is currently taking up PhD in Civil Engineering major in Water Resources Engineering at the same university.

FRAMER Project

FRAMER Project is an offshoot of the Mapua-Phil LiDAR 1 Project through UPD's Phil LiDAR 1 Program.

FRAMER covered minor river basins that were not included in the Phil LiDAR 1's principal river basins. These minor river basins, though smaller than the principal river basins, are important for riverine towns to manage efficiently. Their short concentration time makes flood management temporally critical.

The project looked at the elements' aspect of vulnerability in the areas, as well as the coping capabilities to flooding hazard. Identifying which areas are exposed to the hazard with the corresponding vulnerabilities helped the researchers determine the levels of risk to flooding, which is an important decision support tool for the disaster risk reduction managers. Using IF-SAR DEM for the hydrologic modeling and LiDAR DEM for the river hydraulics, flood hazard maps were developed more accurately. These were included in the risk assessment with parameters that were determined through the analytical hierarchy process. The flood hazard maps were validated and approved by DOST-PAGASA and DENR-Mines and Geosciences Bureau (MGB) and were adopted as an update to the project areas' flood susceptibility maps.

A drainage masterplan with the use of LiDAR DEM, flood hazard and risk information, and a drainage modeling software was also created. This is a more comprehensive drainage masterplan for the municipality.



About the Speaker



EnP Carmeli Marie Chaves
Assistant Professor
School of Urban and Regional Planning-
UPD

EnP Carmeli Chaves is an Assistant Professor at UP's School of Urban and Regional Planning and an active researcher in the Planning and Development Research Foundation (PLANADES).

She earned her graduate degrees in Demography and Urban Planning from UP and in Sociology from the University of Canterbury in New Zealand.

Carmeli Chaves is an Environmental Planner, who ranked first in the 2001 Environmental Planning Licensure Examination.

She is the project team leader of the Settlements Development Model for New Growth Areas in the Philippines commissioned by DOST from UPD that built the model and trained more than 500 planners and program managers nationwide.

She has more than 20 years of experience in settlements planning, participatory planning, socio-demographic research and evaluation, project implementation and assessment, and training. She has established networks with government and non-government organizations, and coordinated with local chief executives on land use and development planning, including the introduction of policies at the local level. Her current involvements are as resettlement specialist of the Metro Manila Subway Project and of the Mindanao Railway Project.

Prof. Chaves is a proud Mindanawon, having been born in Zamboanga City and grown up in Cagayan de Oro City.

Formulation of a Settlements Development Model for New Growth Areas in the Philippines

There is a mismatch in the housing supply and demand in the Philippines, especially in resettlement housing. This is indicated by the phenomenon of displaced beneficiary families trooping back to their places of origin; distant, unsuitable, incomplete, and substandard settlement projects; and unoccupied housing units in government resettlement projects. To facilitate planned settlements development, this study offers a model that identifies drivers of urban growth in the Philippines and provides a tool to identify suitable new growth areas. The regression analysis and spatio-temporal stochastic model projected the top 20 future growth areas at the national level. It has the potential to identify future growth areas within cities and municipalities. Additionally, the methodology simulates future urban expansion, prescribes a suitable location for new settlements, and provides planning guidelines to support these growth areas. Surfacing the drivers of urban growth, conducting population projections, land use simulation, and planning new areas—these are S&T-based approaches that local governments can use in drawing up spatial and development strategies and integrating them in the planning process. It is hoped that this model will be used to benefit Filipinos, especially the underprivileged and homeless sector.





About the Speaker



Philip A. Martinez

Senior Science Research Specialist
DOST-ASTI

Philip Martinez is a Senior Science Research Specialist of DOST-ASTI, engaged with projects related to wireless communications. Prior to ASTI, he was an affiliate of the UP Wireless Communications Engineering Laboratory and was a Research Engineer for various taxpayer-funded projects that focused on developing context-appropriate wireless communication technologies to empower resilient communities and establish internet access in geographically isolated and disadvantaged areas (GIDAs) of the country.

He was part of the team that help launch the first community cellular networks in the Philippines, a 'bottom-up' connectivity strategy where the communities own and operate the cellular network instead of the big telco companies. His research interests are in information and communications technology (ICT) for development and wireless communications.

He dreams of a better-connected Philippines, where every Filipino has equitable access to opportunities brought about by reliable information infrastructure.



The Resilient Education Information Infrastructure for the New Normal (REIINN)

The first component of Project REIINN, named LokaLTE, aims to develop a small-scale LTE base station prototype operating at 600 MHz. The prototype would then provide the much-needed LTE connection in the chosen pilot test areas. The impact of providing data service through Community LTE deployments will also be evaluated.

The second component of Project REIINN, named RuralCasting, aims to develop an educational and interactive Digital TV application framework, leveraging datacasting technology with wireless return channel. The wireless return channel is a way to send feedback and output from students back to the teachers. It also aims to assess the impact of interactive digital TV applications in learning engagement of students, especially in rural areas.

In summary, Project REIINN aims to develop Technology Demonstrators to champion for policies that will enable a more equitable and efficient use of spectrum. The researchers also aim to spur in local production of datacasting capable Digital TV receivers, 4G LTE or 5G equipment, and other electronics to lower costs.





About the Speaker




Emelita P. Bagsit
OIC-Regional Director
DOST IV-A (CALABARZON)

Emelita P. Bagsit is the OIC-Regional Director and the Assistant Regional Director for Technical Operations of DOST CALABARZON.

She is a registered chemist, with a degree of BS Chemistry from UPLB, Masters (MA) in Technology Management from UPD, and a Diploma in Research and Development Management from the University of the Philippines Open University (UPOU).

As a significant member of the DOST CALABARZON, Bagsit has pioneered and led the implementation of several S&T projects, R&D and Community-based initiatives in the region, including but are not limited to the Makapuno Island Project and the Halal Verification Laboratory. She also previously served as the head of the Regional Standards and Testing Laboratory of DOST CALABARZON.



DOST Smart Food Value Chain Program for the New Normal: Leveling-up of Quezon's Bagsakan Center Agri- Processing Facilities through Adoption of the Smart Food Value Chain Framework

In line with DOST Smart Value Chain Program for the New Normal, the DOST CALABARZON, through its Provincial Science and Technology Center in Quezon, spearheaded the project titled "Levelling-up of Quezon's Bagsakan Center Agri-Processing Facilities through Adoption of the Smart Food Value Chain Framework." The project aims to respond to the problem of overproduction, particularly in the Bagsakan Center in Sariaya, Quezon: the Sentrong Pamilihan ng Produktong Agrikultura ng Quezon Foundation Inc. Through the introduction of agri-production, food processing, and waste management technologies to the Bagsakan Center, the project envisions to strike a balance in the food supply chain in Quezon and nearby communities, bridging the barriers between production and consumption.





About the Speaker



Ryan Sabio
CEO and Co-founder
Tekton GeoMetrix Inc.

Ryan Sabio is the CEO and Co-founder of Tekton GeoMetrix Inc. He has broad experience in the field of product design and development, R&D management, and technology management.

He received his degree in Industrial Design UST and currently is a graduate student of Technology Management at UP.

In 2011, Mr. Sabio organized a small R&D team to develop their first seismograph prototype called Trx-vibron. The R&D team was composed of geophysicists, structural engineers, and UP Electrical and Electronics Engineering (EEE) students. The Trx-vibron seismograph is a seismic instrument, which was designed to monitor the effects of pile driving on structures, as well as analyze environmental impacts of diesel power plants in Mindanao.

To further understand and improve the development of local earthquake recording instruments, Mr. Sabio attended a seismic instrumentation program at Géosciences Azur-Université Côte d'Azure in Nice, France, where he studied instrument installation and data recording and analysis, including interpretation.

With the guidance of UP Technology Management Center (TMC) Director Professor Edison Cruz and and Strategic Management Professor Glen Imbang, he was able to receive DOST funding for his R&D project to create a local strong motion accelerograph aimed to measure the structural response of buildings during damaging events.



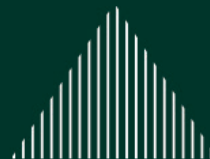
QBX-SMA (Earthquake Recording Instrument for Buildings)

SMA (Strong Motion Accelerograph) is a geophysical instrument commonly used for earthquake observation and structural analysis. It helps determine the level of vibration a building can withstand during an earthquake. Through seismic data processing and structural modeling, SMA also can reveal any structural failures not readily observed during visual inspection.

QBX is an affordable yet reliable Philippine-made SMA which is to be offered to government and small businesses, leading to protection of humans and properties during earthquakes and allowing society and business to continue its function.

Since 2017, QBX-SMA has been promoted by DOST TAPI in various events such as National Science Week and Philippine Innovation forums by Philippine Chamber of Commerce and Industry, and DOST Teknowlohiya social media.

Disaster preparedness will be affordable and easily available even to small building owners with the use of QBX. It addresses the high priority concern of reducing the disasters from earthquakes in the country yet it is designed especially for those who cannot afford to invest in expensive instruments.





About the Speaker





Dr. Lilia M. Fernando
Associate Professor
UPLB

Dr. Lilia M. Fernando is a biochemist whose research is on the utilization of secondary metabolites from plant growth promoting bacteria for plant production and propagation. She works on the synthesis, characterization and utilization of biocompatible nanomaterials for improvement of crop productivity along with safety studies of nanomaterials in plants and microorganisms. Her research team also develops nanobiosensors for agricultural, environmental and food safety applications and medical diagnostics.

Dr. Fernando is an Associate Professor at the Institute of Crop Science in UPLB where she teaches agricultural biotechnology courses. She is also an Affiliate Professor at the Institute of Chemistry, UPLB where she teaches plant biochemistry.

She is the co-founder of MakilingTek Inc., a University spin off, which aims to facilitate the commercialization of microbial inoculants and nanobiotechnologies developed by their team through DOST. She obtained her PhD Biochemistry, MS Biochemistry, and BS Chemistry from UPLB.

She is a DOST Scholar and was a recipient of the Overseas Sandwich Program where she conducted her PhD research in Michigan State University. She had her post-doctoral studies at the Massachusetts Institute of Technology where she worked on phage- and yeast-based technologies for agricultural applications.



HormoGroe® and BioGroe®: Plant Growth Promoters

BioGroe™ is a solid-based microbial plant growth promoter which contains plant growth promoting bacteria (PGPB) which was produced and developed in the National Institute of Molecular Biology and Biotechnology (BIOTECH)-UPLB. It promotes root growth through plant growth hormone production and providing nutrients in soluble form. It can be seed inoculated, mixing the product directly to the seed during planting, or it can be mixed with water for root dipping or applied during watering. BioGroe™ aims to reduce the increasing chemical fertilizer usage of local farmers without trimming down their yield and income. The results of the demonstration trials conducted were showed the effectiveness of substituting 50% of chemical fertilizer with the BioGroe™. Results of the cost and benefit studies revealed positive net change in income when the chemical fertilizers used in selected crops were reduced to only half of the recommended rate.

HormoGroe™ is a controlled-release nanoformulation of the plant hormones (auxins, cytokinins, and gibberellins) derived from naturally occurring plant growth promoting bacteria. These naturally occurring plant growth regulators have been shown to enhance seed germination and increase the survival of tissue-cultured plants, seedlings and stem cuttings. Unlike other plant stimulants or growth regulators, HormoGroe™ is non-synthetic and nanoformulated for controlled release to increase uptake in plants such as ornamentals, vegetables, banana, cacao, coffee, cassava, sugarcane and pineapple. The technology has already completed the laboratory testing and preliminary field testing have been conducted. Efficacy trials on different high value crops and ornamentals showed that HormoGroe™ Nano-Plant Growth Regulators can serve as alternative to commercial and/or synthetic plant hormones. The efficacy trials in various crops showed that HormoGroe™ is a promising agricultural product. Using the product on high value crops will help the farmers increase their yield and then their profit.





About the Speaker



Racky Doctor
Entrepreneur/President
Nutridense Food Manufacturing Corp.

Racky Doctor is an Entrepreneur and President of Nutridense Food Manufacturing Corp.

He is an adopter of various DOST-developed technologies on the production of nutrition products. He successfully commercialized DOST technologies to government line agencies and the commercial market.

Doctor aims to reduce malnutrition in the country, especially among children 5 years old and below using DOST-developed technologies.



Fortified Rice-Mongo Curls/Fortified Rice-Mongo Blend/Rimo Blend Instant Cereal Choco Flavor

Rice-Mongo Curls

Malnutrition remains a public health problem in the Philippines, particularly among infants and young children 6 months to 2 years old. This stage is considered as the critical period since any physical and mental damages that may occur to the child during this stage will be irreversible.

Rice-Mongo Curls is a nutritious extruded snack made from a blend of rice flour and mungo flour. The product is crisp and has an appealing cereal taste further enhanced by the addition of natural or artificial flavors.

Rice-Mongo Instant Blend

The Rice-Mongo Instant Blend is a complementary baby blend developed by DOST-FNRI to address malnutrition among Filipino children (6 months and 1 day to 35 months). Process through extrusion, Rice-Mongo Instant Blend is rich in protein, energy, and minerals.





About the Speaker



Ma. Celine C. Angeles is a licensed Civil Engineer with almost 9 years of experience, specializing in Geotechnical Engineering. In 2018, she finished her MS Civil Engineering, major in Geotechnical Engineering from UPD.

Through the years of her involvement in the industry, she gained experience in soil exploration, geotechnical analysis, slope-stability analysis, and ground improvement. In addition, she conducts lectures at the academe in line with her field of expertise, such as geotechnical engineering, geosynthetics, and construction materials testing for aspiring civil engineering students.

Currently, she is conducting researches and product evaluation on new technology for construction materials, both local and abroad for sustainable development in BRS as Material Research Engineer.

Engr. Ma. Celine C. Angeles, MSCE
Engineer II
Department of Public Works
and Highways-Bureau of Research and
Standards (DPWH-BRS)



Waste Materials for Sustainable Pavement Construction: Road Research Project on the Use of Recycled Concrete Aggregates (RCA) as Base Course Materials

With the infrastructure project of the current administration, the construction industry faces an increased demand for construction materials. Future problems arise with the possible scarcity in the supply of major construction materials, such as aggregates. On the other hand, problems with the disposal of demolished debris continue to grow with the continuous repair and rehabilitation of the Department's road network, buildings, and other infrastructure. Arguably, viable solutions of using this construction waste through recycled concrete aggregates (RCA) were already published through successful researches. Hence, the aim of this road research project is to optimize the use of RCA for government projects by developing a local standard specification.

In reference to ASTM D8038-16: "Standard Practice for Reclamation of Recycled Concrete Base Material" and the existing DPWH Standard Specification for Subbase and Base Course Material, RCA was subjected to quality control and was evaluated for its conformance as base course material. The sampled RCA exhibit good performance in the laboratory and was recommended for small-scale pilot trials. The said pilot trials were constructed at Jalajala Friendship Highway, Sta.0+000 to Sta.0+390, Jalajala, Rizal, and Don Mariano Santos Ave. Mahabang Parang Angono (KM 3+360-KM 3+860). BRS will continue to monitor the performance of the constructed pilot trials in actual and local conditions.






About the Speaker

Engr. Neilsen T. Campit is an experienced and well-rounded Civil Engineer with a professional background in the engineering and construction arm of the government. He works for BRS-DPWH for more than 8 years.



He is an R&D Engineer, Field Testing Engineer, Quality Assurance Inspector, and Lecturer who is trained in government infrastructures, quality assurance and control, materials testing technology, R&D, and field testing. Furthermore, he is skilled in leadership, public relations, and team management.

In 2019, he pushed sustainability and environmental consciousness to public roads and highways. In collaboration with DPWH, he was instrumental in coming up with the plastic road, which is the first asphalt road in the Philippines made from plastic bag wastes that was constructed on a heavy traffic national road.

Meanwhile, excellence, collaboration, commitment, and resilience are the core values that represent his character and performance.

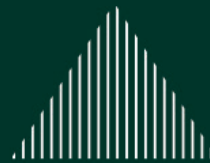


Engr. Neilsen T. Campit, MEnvSus
Engineer III
Department of Public Works
and Highways-Bureau of Research and
Standards (DPWH-BRS)



Waste Materials for Sustainable Pavement Construction: Road Research Project on the Use of Low-Density Polyethylene (LDPE) Polymer Waste (Plastic Bag) as Modifier in Hot Mix Asphalt

This research aims to determine the viability of LDPE polymer waste, specifically plastic bag waste when used as a modifier in hot mix asphalt (HMA). By dry mixing method, this research used the design aggregate gradation of Grading D and shredded plastic bag waste from sizes 6.35 millimeters (mm) to 12.7 mm. Based on the results of optimization, the appropriate amount of LDPE polymer waste by weight of binder is 7.39% (3.80 kilograms per metric ton [kg/metric ton]). Outstandingly, the results showed a reduction of about 50% rut depth in comparison with the conventional HMA from the rutting resistance test. As such, the laboratory outcomes satisfactorily complied with the requirements in the composition and quality of the bituminous mixture. Therefore, the construction of the small-scale trials was recommended to assess the performance of the modified asphalt mix in actual and local field and weather conditions. The first small-scale pilot trial was constructed along Taft Avenue, Southbound, Ermita, Manila, while the second small-scale pilot trial was constructed along Quirino Avenue, Southbound, Paco, Manila. A total of approximately 1,600 kg of plastic bag wastes were incorporated for both road research projects. Moreover, the bituminous mixes were subjected to quality testing after passing the requirements. Currently, no rutting and surface defects are found on the surface of the asphalt pavement. While the use of plastic waste for road construction shows potential as an alternative recycling method (waste management) and a substitute modified binder, further evaluation should be undertaken to strengthen the use of plastic bag wastes for sustainable pavement construction.





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