

HORIZON

University of the Philippines Los Baños Vol.5 No.2



MOBILE APPS FOR SMART AGRICULTURE 2

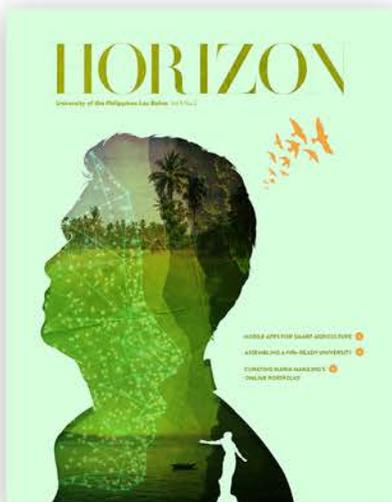
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The **UPLB Horizon** magazine showcases news and feature articles on research and extension, literary pieces, and information of general interest to UPLB and its stakeholders. Please email your contributions to OPR: opr.uplb@up.edu.ph.

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About the cover



On the cover is an outline of a man's bust and overlapping it is another man's face created out of interconnected data points. The first man (and his "surroundings," as symbolized by avian fauna in flight) is designed out of things (and the state that they are in) that represent environmental sustainability.

The interconnected-data-points man represents the multidisciplinary expertise in UPLB, with the data points illuminated to symbolize the various expertise as wellspring or hot spots of knowledge. The data points are linked to symbolize the interconnectedness in the fields of expertise. Interconnectedness highlights the compelling need for collaboration among the multidisciplinary experts in the university.

UPLB has begun to capitalize on a collaborative culture to go into smart agriculture, bioinformatics, information systems, and e-commerce. These are among the "hybrids" that UPLB is pursuing to embrace the Fourth Industrial Revolution.

With high technology, a collaborative culture would not only help create, but would actually accelerate innovation, and ultimately help make the university agile in serving the people.

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EDITOR'S NOTE

We have seen a rising number of conversations and events on the Fourth Industrial Revolution and how the university should play catch up. Chancellor Fernando C. Sanchez, Jr. himself repeatedly broached the topic in speeches, and in fact, made it a centerpiece around which strategic plans were drawn up for the university early this year.

The university envisioned UPLB Research 4.0 – to develop and harness smart, efficient, climate-responsive, sustainable, and accessible solutions concerning three major R&D areas: food, water, and energy.

In instruction, it pursued the certification, quality assessment, and revision of degree programs in accordance with K-12 and outcomes-based education.

To be clear, UPLB had applied and promoted the use of big data, decision support systems, nanomaterials, Internet of things, robotics, and synthetic biology in research and instruction. And to hasten up developments, UPLB has pushed for collaborations of its multidisciplinary experts and with government agencies and other entities to transform Philippine food systems.

Some of the stories featured here show how these collaborations facilitate technology generation and knowledge product development. Others show collaboration in improving operational management in the university, and the rest, on how it enables alumni and friends to help provide much needed learning and financial resources to students.

Collaboration resonates thru these stories of high technology, operational management, and of paying forward.

IN BROAD STROKES

Towards UPLB 4.0

Dr. Fernando C. Sanchez, Jr.



Today, we are in the midst of the Fourth Industrial Revolution or FIRE, fundamental changes enabled by computerization, automation, and technological breakthroughs including advanced robotics, artificial intelligence, the Internet of Things, nanotechnology, data analytics, and biotechnology.

As an academic and research institution, UPLB must come to grips with FIRE, embracing technologies and knowledges that help us realize our vision of being a globally competitive graduate and research university contributing to national development while critically interrogating FIRE's impact and implications in society.

UPLB already has projects in line with various aspects of FIRE. These projects support technological innovation, improve our capacity to develop knowledge capital in strategic areas of strength, and enable the university to meet quality assurance goals.

We strive to be at the forefront of the development of biofertilizers, vaccines, antibiotics, and biopesticides through research in synthetic biology. Under our One Health Program, we are now embarking on the development of biosensors that could be used in ensuring health and food security.

Through current programs, UPLB is developing technologies in smart agriculture. We are employing robotics to strengthen our capability in food security, natural resources conservation, and environmental protection. Data analytics, facilitated by computational resources, is enabling our climate scientists to come up with decision support systems in agriculture.

Our researchers are applying geomatics for precise and smart forestry, monitoring trees to determine the impact of climate change on their growth and identifying species that are

climate change-resilient. Meanwhile, in the field of nanotechnology, UPLB researchers are developing materials for sensing, medical devices, and bioremediation. Their work has applications not only in chemical manufacturing and power generation but also in the distribution of agricultural products, such as in extending fruit shelf life through coatings and the utilization of sensors that warn against product spoilage.

In order to continue and enhance research in these fields in the context of FIRE, we need to ensure that our students' education is of the highest quality. Regarding this, we revised our undergraduate degree programs to address concerns raised by the K-12 system. As we are always finding ways to make learning more effective, the university conducted a training program on learner-centered instruction in 2018.

It is our goal to enhance the university's global competitiveness. In order to ensure that our academic programs meet international standards and are competitive in the ASEAN region, we have taken steps towards the certification of our degree programs under the ASEAN University Network Quality Assurance (AUN-QA) program. With the encouraging result of the recent EU-SHARE institutional assessment and successful AUN-QA certification of some of UPLB's undergraduate degree programs, UPLB can confidently further pursue quality assessment activities. Moreover, at the heels of BIOTECH's recent ISO certification, we are about to begin ISO certification procedures for our other flagship research programs.

Substantial financial and infrastructural resources are necessary to realize UPLB's vision of becoming a technologically innovative institution, but with solid and steady research and academic work and the dedication to provide high-quality education, UPLB is at a good starting point from which to tackle the challenges posed by FIRE.



MOBILE APPS FOR SMART AGRICULTURE

MARK JAYSON E. GLORIA

A popular folk song tells us that farming is no joke.

From planting to marketing, the burden is indeed heavy for the Filipino farmer. But what if the time comes when farming becomes a little easier with the help of information technology, say smart phones?

Impossible?

The UPLB-led Project SARAI, or Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines shows it is possible. Its crop experts and IT specialists have joined forces to develop mobile applications or “apps” that would give crop advisories to farmers.

These apps that can be downloaded to one’s smart phones for free are only a few among the IT-based crop monitoring and forecasting tools that the program has been working on for the past seven years.

“Project SARAI envisions Filipino farmers to have the right information at the right time – when best to plant, when to harvest, what to plant, how to best fertilize, how to manage pests effectively and efficiently, and how to optimize use of irrigation water,” said Dr. Ma. Victoria Espaldon, program leader.

Crop advisories from these apps, according to Concepcion Khan, project leader of SARAI’s Knowledge Portal and Mobile Applications for Digital Agriculture, could help farmers plan other activities, such as applying for loan and hiring farmhand. Khan is a faculty member at the Institute of Computer Science.

Project SARAI has incorporated agricultural knowledge with open-source software, big data from satellites and automatic weather systems, and other existing technologies. The program operates with funds coming from the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (DOST-

PCAARRD) and counts on a team of more than 100 scientists, researchers, and programmers from 12 state universities and colleges and six government agencies nationwide.

RAIN ALERTS

Rain forecasting need not be a guessing game with SARAI Alerts, an application that provides precipitation data within the day, weather forecast for the next five days, and rainfall outlook for the next five months.

SARAI Alerts has two weather sources: its own automatic weather station installed in 19 agricultural areas all over the country that gives updates every six hours and Open Weather Map’s network of weather stations in all municipalities in the country that provides updates every three hours.

According to Jacquelyn Tandang, one of the consultants for this app, SARAI’s experts use data from these rain and weather forecasts to come up with advisories for each crop such as the best times to plant and harvest.

These site-and crop-specific advisories reach the mobile phones of farmers/SARAI Alerts users who grow SARAI’s nine priority crops: banana, cacao, coconut, coffee, corn, rice, soybean, sugarcane, and tomato.

Tandang said that SARAI Alerts has a “push notifications” option, which means that alerts automatically land on the phone’s home screen once connected to the Internet. But she added that constant Internet connection within the day is not a pre-requisite. “Once it is cached, it will update the whole day,” she said.

Khan pointed out that caching enables a device/computer to store data for future use, which makes SARAI apps reliable even with occasional absence of the Internet. “Fast Internet connection is no longer a limitation. We deliver advisories to the device of their choice anytime, anywhere, whether with Internet or without Internet,” she said.

INSECT PEST AND PLANT DISEASE IDENTIFIER

Meanwhile, farmers will no longer become clueless and frightened about insect pest and plant diseases through the help of another app called SPIDTECH.

SPIDTECH, or the Smarter Pest Identification Technology can be used to identify, manage, report, and monitor insect pests and plant diseases through its three modules, namely: Pest and Disease Identification Feature, Pest and Disease Library, and Remote Monitoring.

According to Angelo Guiam, SPIDTECH programmer, there are three ways of using the Pest and Disease Identification module of the app, all of which would lead to the diagnosis of the insect pest or plant disease, and the appropriate management strategies.

Guiam said that this module uses machine learning technology, an artificial intelligence that utilizes image recognition to classify insect pest and plant disease.

Integrated to the app’s identification feature is a database called Pest and Disease Library, a knowledge bank that contains information about major insect pest and plant disease of rice, corn, coffee, and cacao. The pocket-size mobile encyclopedia contains information from various references collated in consultation with entomologists and plant pathologists of the National Crop Protection Center (NCPC).

NCPC and the Institute of Computer Science (ICS) collaborated in making SPIDTECH, with Guiam, Melvin Ebuenga, SARAI project leader for Insect Pest and Disease Advisory System, Kristine Gamba, and Wilson de Panis as developers of SPIDTECH Version 2.0.

UPLB received a Certificate of Copyright Registration and Deposit for SPIDTECH Version 2.0 from the National Library of the Philippines on May 14, 2019.

Mobile apps similar to SPIDTECH exist, but what makes the latter unique, Guiam said, is its remote monitoring module. Its server logs the results that the users obtained, which allows the team to remotely identify and monitor the occurrence of insect pest and plant diseases in the country.

Such feature of SPIDTECH, noted Dr. Christine Marie Casal, SARAI senior science research specialist, promotes “citizen science” since ordinary people are involved in providing data for the bigger

goal of early detection of insect pest and disease in a locality.

HANDY COFFEE TRACKER

With the Coffee App Harvest Estimator (CAPHE), farmers no longer need to visit their coffee farm often, especially if these are located far from their home base.

With the app, coffee farmers will have a handy tracker that would inform them about appropriate times to visit their farms based on the phenology or life cycle of coffee — from the inflorescence, berry development, to berry ripening.

CAPHE users only need to identify their farm location and coffee species, be it Robusta, Arabica, Excelsa, or Liberica.

By clicking a photo that best represents the current stage of their plant, CAPHE would automatically calendar the critical dates when farmers should visit their farm. They would be advised on expected events and interventions such as the period to manage possible infestation, and ultimately, the time to harvest.

With caching, Khan added that there is no need for constant Internet connection in using CAPHE. This app would already set the remaining milestones of the crop until harvesting, depending on the first time the farmer uses it.

The coffee lifecycle prediction in CAPHE is based on a study led by Project SARAI study leader, Bong Salazar. CAPHE and SARAI Alerts were developed by ICS graduate and undergraduate students under the guidance of Khan. BS Computer Science student Natalie Nicole Soluren was responsible for developing CAPHE.

ACCESS

SARAI Alerts and SPIDTECH can now be downloaded at Google Play Store. SPIDTECH is also available at pythonanywhere.com.

With these apps aimed at making farming easier, many wonder if farmers use them.

The SARAI team admits that not all farmers have access to smart phones, but in the meantime, they see agricultural extension workers as the ones who could bridge this gap. "Extension workers can inform farmers, and can convince [them] later on to subscribe [to these apps]," Khan said.

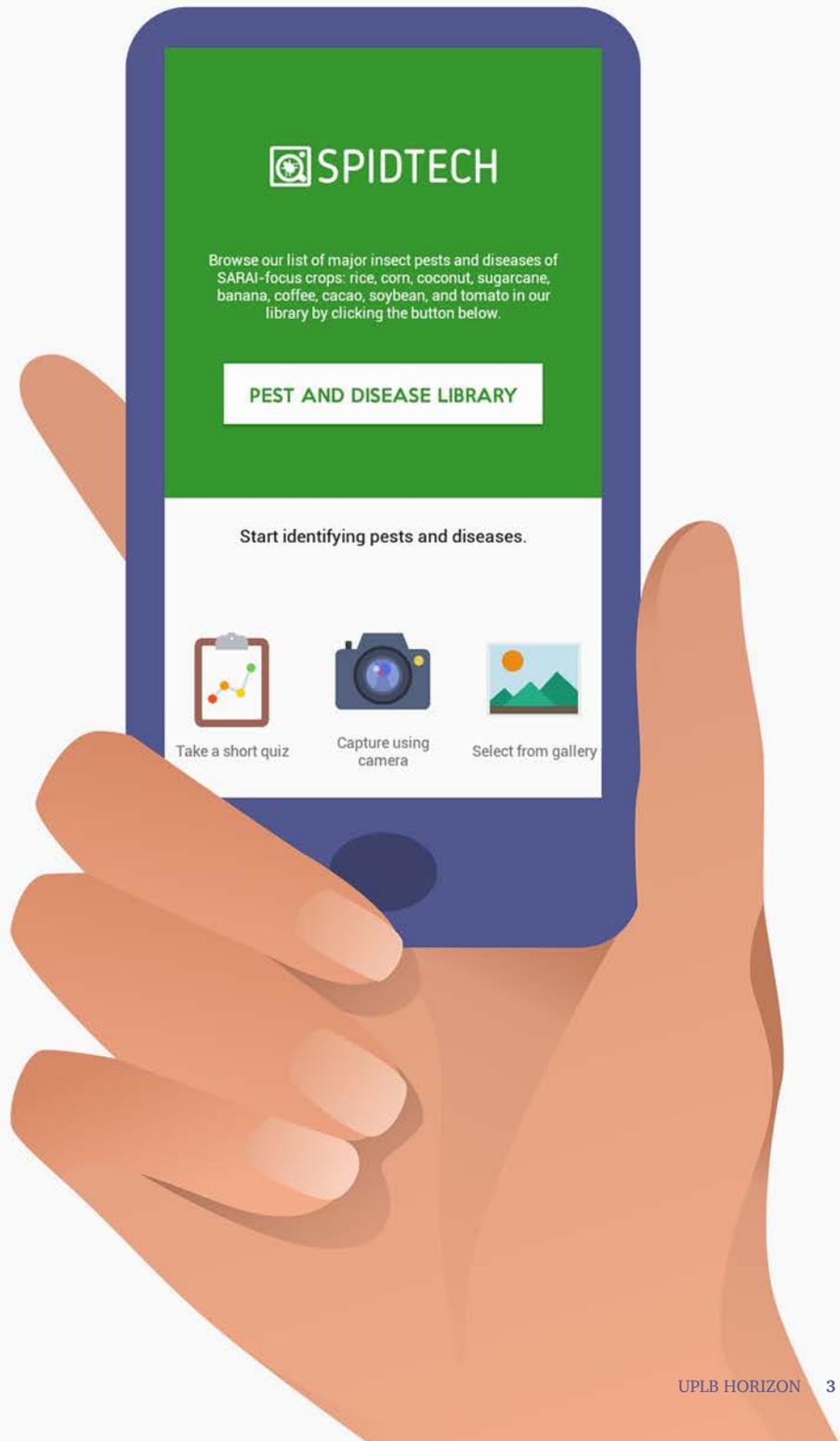
"It is one of the strategies to bring the technology to the farmers."

For Dr. Espaldon, these apps can provide easy access to information not only to farmers and agricultural technicians, but also to other agriculture stakeholders, such as farmer leaders, farm communities, LGUs, and the media. "Information is ready at your fingertips!" she said.

Khan acknowledged that these apps are technologies waiting to be taken by farmers. "It's an opportunity that all

farmers should avail for themselves. It is liberating and powerful enough to ensure that they will get optimum yield at the end of the day," she said.

Farming is indeed no joke; at times, circumstances make things even harder for farmers. But with partners who seriously take on the task of reducing the farmers' burden, such as Project SARAI, there is hope for ease in farming as a livelihood, or shall we say, smart agriculture, for the country's food producers.



ASSEMBLING A FIR_e-READY UNIVERSITY

JOHN GLEN S. SAROL

In the wake of the Fourth Industrial Revolution (FIR_e), UPLB has been slowly but surely strengthening its computational sciences and arts programs with the Institute of Computer Science (ICS) at the forefront.

The institute has teamed up with different groups in the university to advance multiple research projects in UPLB.

"ICS has been trying to help advance our agriculture and environment sector, but we would not have any progress without the help of different fields of study in the university," said Jaime Samaniego, former director of ICS.

Collaboration, Samaniego emphasized, is an important aspect when approaching FIR_e, and at the Physical Sciences Building, a new laboratory - the UPLB Computational Interdisciplinary Research Labs (CINTERLABS) - tries to embrace just that.

TEAM-BUILDING

Building on the individual strengths of the various academic units, CINTERLABS is creating a research and development niche where researchers – faculty-supervised undergraduate and graduate students from various disciplines – work together to study emerging problems and find creative computational solutions.

"CINTERLABS consists of research laboratories that house different experts working on their projects. The whole layout of this lab promotes interaction, hoping that they will have meaningful partnerships in the end," explained Samaniego, who also chairs the interdisciplinary laboratory.

"There are times when researchers are not aware of other teams' capability and research findings. With CINTERLABS, we are breaking this barrier, and hopefully we will come up with fruitful outcomes," he added.

EMERGING TECHNOLOGIES

One of the teams in CINTERLABS is the "drone team" that is made up of researchers from the Physics Division of the College of Arts and Sciences and from the College of Engineering and Agro-industrial Technology. They have been testing drones to process digital images which can determine agricultural crops' nutritional deficiencies, stress, lack of water, and other problems in agriculture.

The team has also tested the flying machines to monitor other ecosystems, such as forests, coastal areas, and coral reefs.

Another is the ICS team of the Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI), a program funded by the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD) of the Department of Science and Technology (DOST).

In collaboration with crop experts, data modelers, statisticians, mathematicians, software engineers, and students from ICS. The institute have developed the SARAI Knowledge Portal and various mobile applications for crop advisories.

Also funded by PCAARRD and housed in the CINTERLABS are the projects Knowledge Management of Agriculture, Aquatic, and Natural Resources (KM of AANR) and Swine Cart: An E-Commerce System for Breeder Swine and Boar Semen.

The KM of AANR aims to provide an online platform for DOST-PCAARRD Innovations and Technology Center, and develop a KM system in streamlining knowledge sharing on research outputs of the AANR sector.

On the other hand, the Swine Cart project seeks to bridge the gap between the producers and the consumers of breeder swine and boar semen through an e-commerce system. Now at its Phase 2, the project team from CINTERLABS plans to deploy it to make it available to its target users and stakeholders.

The other teams from CINTERLABS are the Human-Computer Interaction team, Graphics and Image Processing team who are working on the Digital Laguna Project, and the Bioinformatics team.

"Having a common physical space for collaborations among different disciplines provides an enabling environment," said Rikki Lee Mendiola, one of the researchers working for the KM and Swine Cart projects.

"Running into a colleague while getting a cup of coffee can mean a chat about how the project is going or a random new idea. The space means you can bring together experts from various fields and foster mentorships with junior researchers," Mendiola explained.

Little by little, UPLB is putting together the building blocks to help various sectors in the country level up to FIR_e's challenges. Like any other process of developing technologies, the rest of the teams involved are still in the phase of exploration and tinkering.

But soon, all of their collaboration efforts shall result in sophisticated tools to help advance different research disciplines in the university, and slowly but surely, in the whole country.



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Photo by Yandolph R. Maningas

DNA-BASED NANOBIOSENSOR IS DAVID TO THE GOLIATHS OF FOOD SAFETY

JUAN PAOLO A. AQUINO

The power of “nanomaterials,” extremely tiny materials that cannot be seen by the naked eye nor with the use of ordinary microscopes, but have incredible properties, should never be underestimated.

As research in UPLB is now proving, with their incredible properties, they are akin to David and could help render the Goliaths of food safety—pathogens like *E. coli* O157:H7, *Salmonella*, and *Listeria monocytogenes*—ineffectual.

These bacteria, when ingested and consumed at a certain level, cause diarrhea, infection, and worse, death.

Scientists and researchers at the National Institute of Molecular Biology and Biotechnology (BIOTECH) have used information technology or bioinformatics to maximize the power of nano materials and come up with DNA-based nanobiosensor for use in detecting contaminants and pathogens in food, feed, and water.

DNA nanobiosensor could rapidly and accurately detect these pathogens in as fast as 1-5 hours, depending on the sample and level of contamination. This makes it far more superior to the polymerase chain reaction (PCR) technology that requires at least 24 hours in multiplying the DNA to make analysis and identification possible.

According to its lead scientist, Dr. Francisco B. Elegado, research professor at BIOTECH, a UP Scientist, and UPLB outstanding researcher for 2019, in using

NANOBIOSENSOR RESEARCH AT BIOTECH

| TITLE | Project Leader/Duration | Funding Agency |
|--|--|----------------|
| Development of DNA-based nanobiosensors for food and environmental applications | Dr. Francisco B. Elegado March 2012-Sept 2014 | DOST-PCIEERD* |
| Development of a nanobiosensor for detection of prevalent <i>Escherichia coli</i> O157:H7 strain in the Philippines | Dr. Lilia M. Fernando Nov 2014-April 2017 | UP EIDR** |
| Nanobiosensor for the detection of <i>E.coli</i> , <i>E. coli</i> O157:H7 and <i>Salmonella enterica</i> in water, food, feeds and fresh produce | Dr. Francisco B. Elegado Current | DOST-PCIEERD* |

*Department of Science and Technology-Philippine Council for Industry, Energy and Emerging Technology Research and Development

**University of the Philippines Emerging Interdisciplinary Research Program

nanobiosensor, the suspect food or liquid that is going to be analyzed would just need to be mixed with magnetic nanomaterials, which then attract and capture bacterial cells.

The target pathogen specifically hybridizes with the DNA probes attached to electrically active magnetic nanomaterials. Information on the presence or absence of dangerous bacteria would then appear on the nanobiosensor's monitor.

Specific nanobiosensor DNA probes were designed using specialized software called Molecular Evolutionary Genetics Analysis (MEGA) 4, which is a tool for bioinformatics and DNA sequencing analysis.

Another advantage in using this technology is its portability. Unlike PCR that can only be used in a laboratory,

the nanobiosensor package is handy and can be brought to and used in the field, Dr. Elegado said. It also needs lesser investment compared to the PCR technologies.

Nanobiosensor technology was first introduced in BIOTECH in 2010 by Dr. Evangelyn E. Alocija, a "*Balik Scientist*" from Michigan State University. BIOTECH later pursued a series of projects to validate its potentials. (See "Nanobiosensor research at BIOTECH.")

Dr. Elegado's team is currently conducting another DOST-PCIEERD-funded project entitled "Enhancement, field validation and market readiness of DNA-based nanobiosensor for the detection of *E.coli*, *E. coli*

O157:H7 and *Salmonella enterica* in water, food, feeds and fresh produce." It aims to enhance and validate the nanobiosensor technology in the field.

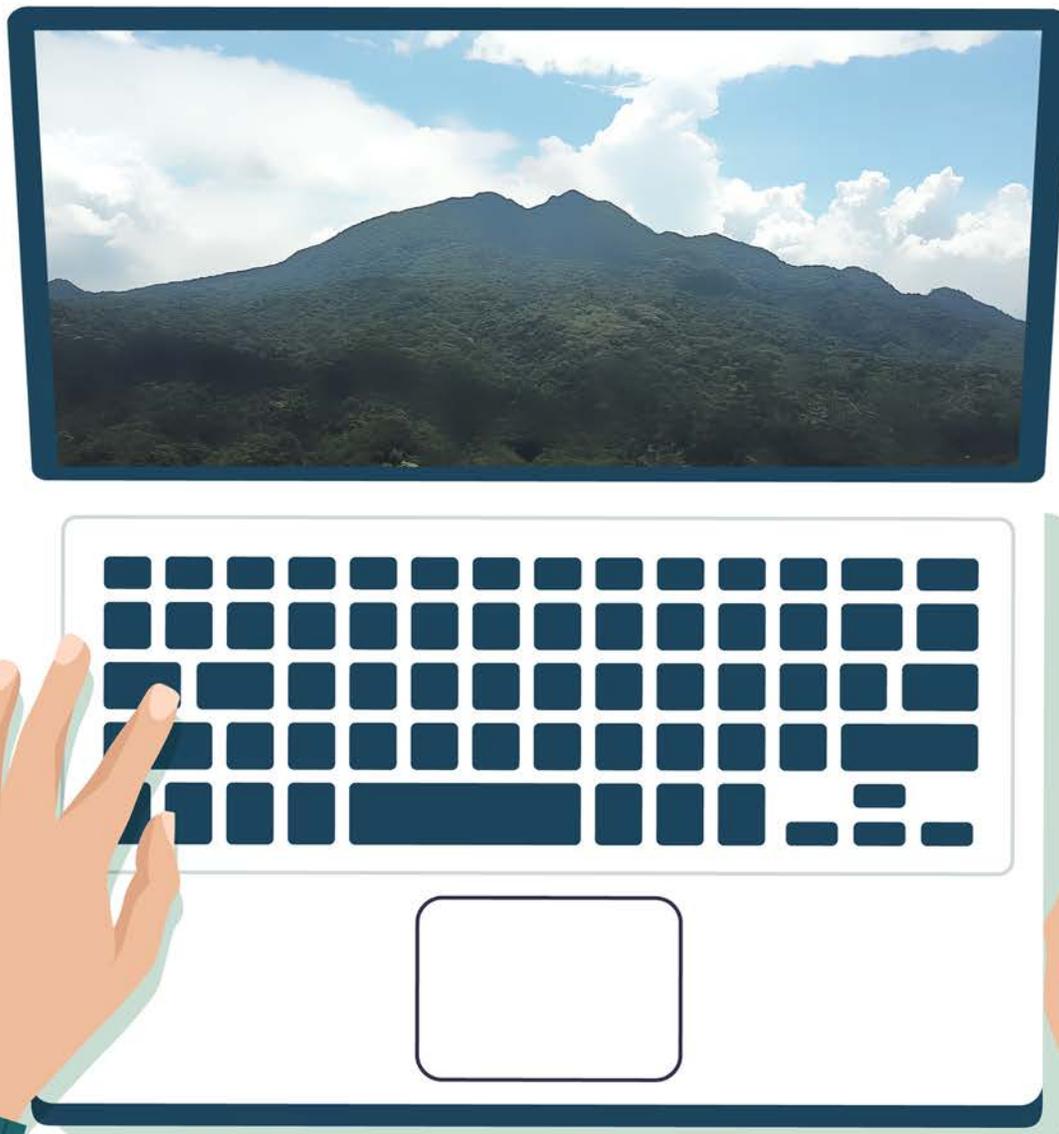
The nanobiosensor technology, according to Dr. Elegado, has potential market in the water, food and feed manufacturing industries, and in ensuring safety in organic food produce.

The small, portable, and agile nanobiosensor could effectively strike a fatal blow to this public health problem.

It is high time for cutting edge technology to be used in order to provide a solution to food pathogens that have compromised public health for far too long.

CURATING MARIA MAKILING'S 'ONLINE PORTFOLIO'

KRISTINE E. ARAGUAS



Graphics designed by Freepik



MakiBIS has inspired a bigger biodiversity portal, the Philippine Biodiversity Information System (PhilBIS), which shall showcase the country's biodiversity, considered one of the richest in the world.

For Dr. Macandog, MakiBIS and the future PhilBIS are platforms that could influence the drafting and implementing of conservation management plans and policies to protect the biodiversity of the country and to address the problem of invasive species in MMFR.

What if Maria Makiling were humanized in this digital age? If she owns social media accounts, what 'personal data' would she be sharing online?

As the legendary guardian of her namesake mountain, it would be natural for her to post "grammable" images of the diverse flora and fauna found at the Mount Makiling Forest Reserve (MMFR) like endemic flowers, unusual insects, and elusive birds of what has been hailed as the 33rd ASEAN Heritage Park.

While "netizen Maria" is just a reverie, a group of interdisciplinary experts from the university has been actually "curating" these contents for her, not for vanity, but for the sake of biodiversity knowledge and conservation.

With the Makiling Biodiversity Information System (MakiBIS), an upcoming online portal that stores photos and taxonomic information about MMFR's wildlife wonders, Makiling's natural beauty will go online soon.

Behind this biodiversity portal are biology and information technology specialists led by Dr. Damasa M. Macandog, project leader and professor at the Institute of Biological Sciences.

She works with a team from the Institute of Computer Science (ICS) headed by

Fermin Roberto G. Lapitan, assistant professor.

From a simple Microsoft Excel database in 2011, MakiBIS has evolved into a more sophisticated portal. It has undergone three rounds of development with the help of Dr. Malou Nicolas, then director of the UP Center for Integrative and Development Studies (CIDS), ICS, and the Commission on Higher Education-Philippine Higher Education Research Network under the Enhancing Food Security Program in Biodiversity and Agriculture (CHED-PHERNET) project.

In its latest version, MakiBIS 2.0 uses ReactJS for its frontend and NodeJS for its backend, according to Lapitan. He added that it still uses MySQL for its database, with updates on its structure.

MakiBIS stores information on over 2,000 species, with more than 1,550 vascular flora, 20 species of birds, and 35 fish species coming. This wealth of data is seen to add to worldwide access to biodiversity information and identification, especially now that there is a growing global concern about biodiversity loss.

MakiBIS' function aligns with the Global Biodiversity Information Facility (GBIF), a Denmark-based international network that promotes open access to biodiversity data around the world. In fact, the MakiBIS

team aims to allow future users to readily access available information of each taxon as patterned after the standards of GBIF and Darwin Core platform. Darwin Core is a body of standards that facilitates biological diversity information sharing.

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For Dr. Macandog, MakiBIS and the future PhilBIS are platforms that could influence the drafting and implementing of conservation management plans and policies to protect the biodiversity of the country and to address the problem of invasive species in MMFR.

Maria Makiling, the imaginary protector of the mountain, may not be able to curate the beauty of MMFR, but once MakiBIS is up and running, the world shall gaze at her online portfolio, not only to like and to love, but to know and to nurture.

(With reports from Development of Makiling Biodiversity Information System (MakiBIS): A Philippine Biodiversity Information System (PhilBIS) Prototype by Dr. Damasa B. Magcale-Macandog, Fermin Roberto Lapitan, Christian Paul P. Dela Cruz, Teodorico L. Marquez, Jr., Marlon A. Reblora, Kristine S. Mago, and Mary Grace M. Primavera)

TEAM BIOTECH, CERTIFIED “TEAM EXCELLENCE”

AN INSTITUTE’S COLLECTIVE JOURNEY TO ISO 9001:2015

JESSA JAEL S. ARANA

UPLB’s annual roster of recipients of awards for outstanding personnel and team is never complete without at least one name from the National Institute of Molecular Biology and Biotechnology (BIOTECH).

But as Greek philosopher Aristotle famously said, the whole is greater than the sum of its parts. So is BIOTECH’s reputation in the research world being definitely an offshoot of a concerted effort towards excellence.

A case in point is its certification of quality from the International Organization for Standardization (ISO). In the words of its past director, Scientist Rosario G. Monsalud, “*walang nagpaiwan*” (no one was left behind at BIOTECH) as its seven programs, 22 laboratories, and more than 200

staff pursued a new milestone together—securing the ISO 9001:2015 certificate for the 40-year-old institute.

The ISO certificate effective June 18, 2018 to June 17, 2021 is a stamp of quality that assures BIOTECH’s clients that it is able to provide quality products and services and improve over time while the institute optimizes its resources.

It signifies that BIOTECH’s technical and laboratory services, and research and development, and extension activities in relation to agriculture, food, forestry, industry, environment, and energy are certified to be operating under a management system that subscribes to international standards.

This is not the first ISO certification for BIOTECH. Two of its laboratories—the

Central Analytical Services Laboratory and the Philippine National Collection of Microorganisms—were awarded the ISO/IEC 17025:2005 in 2014 and 2015, respectively. These also served as UPLB’s first ISO certificates.

Dr. Fidel Rey Nayve, Jr., research assistant professor and program leader of BIOTECH’s Technical Services Program, said that preparing for ISO certification normally takes two years. But BIOTECH did it in four months because years prior, it had set its focus on self-organization, planning, and documentation.

BIOTECH had a system in place and had produced viable plans in previous strategic planning sessions, which they were able to use in applying for ISO certification.



The personnel also prepared themselves mentally for the application process. They participated in training sessions to orient themselves on the rationale, implications, and benefits of ISO certification. Training on internal audit and documentation were also undertaken to put everybody on-board.

According to Dr. Monsalud, who spearheaded the application as its then director, becoming ISO-certified is strategic to improving the institute's overall performance and documenting its progress and activities as basis for future development.

"ISO [has taught us that] when you do planning, you have to look at possible risks if plans would not materialize," Dr. Monsalud said.

"As a group, we are able to organize and prioritize our projects," added Dr. Susana M. Mercado, also a research assistant professor and head of the Biotechnology for Food, Feed, and Specialty Products Program.

Scientist Edwin Alcantara, who leads the Biotechnology for Natural Products Program, also noted that planning as a whole unit helped them focus everyone's efforts toward achieving the overall vision of the Institute.

"Of course, each program has its own particular goals," said Dr. Alcantara. "Having an organized system helped us facilitate all of these goals toward our main vision."

Beyond making plans, BIOTECH also developed a culture of 'check and balance' to make sure that they follow through on their official protocols.

External auditing is part of maintaining their ISO certificate, a practice that they say helps keep them on their toes. In May 2019, BIOTECH passed its first round of annual surveillance audit, securing their certification for another year

and proving once again their united commitment to quality service.

The ISO monitoring and audit, Dr. Monsalud added, also institutionalized regular equipment calibration which is key to accuracy in experimentation, as well as staff development and retooling through regular trainings, to ensure that knowledge and skills are up to date.

Standardizing documentation also extends to their general records keeping, making historical data easily accessible, whenever they need it.

In two more years, BIOTECH will be facing the ISO re-certification process after its first certificate expires. With the combined wisdom, talent, and commitment from the institute's workforce, "Team BIOTECH" can certifiably slay this challenge and more.



Photo by Christopher M. Labe

PRESERVING A 'WEALTH' OF DOCUMENTS IN THE DIGITAL AGE

MARK JAYSON E. GLORIA

If stacks of documents could be a measure of an organization's wealth, UPLB would be in the running for the "richest" title.

With almost 2.4 million pages of official documents in its "treasure chest," UPLB has accumulated a wealth of data and information since the late 1940s.

Some of these are minutes of meetings of important university bodies on major decisions that shaped the university through the years; contracts and reports that record campus milestones; correspondences and speeches of institution builders; and records of personnel who have served the university.

But the 200-sqm depository of these documents at the Records Management Office (RMO) can only hold so much, prompting its then chief, Ms. Apolonia Talatala, to go digital since 12 years ago. Threats—force majeure and otherwise—made the initiative even more urgent.

The project started with converting hard copies of employees' 201 files to digital formats using a scanner. In 2011, RMO sought a more advanced and efficient technology in preserving documents and acquired an automated document management system (ADMS) featuring digital imaging technology that scans, index-tags, and stores documents.

More than PhP 7 million was allotted for the project with PhP 4 million for personal services and the rest for equipment and supplies.

The pieces of equipment are a peripheral scanner/printer/copier, a software and hardware system, and antivirus software acquired in 2011; and two scanners acquired in 2014.

With this, RMO has digitized a substantial number of official documents and has expanded to general and bound records. As

of June 2019, 54% have been prepared for scanning; 49% have been scanned; and 23% have been indexed-tagged out of the 2,393,941 pages of documents that RMO keeps.

Preparation for scanning is a painstaking process where the staff carefully unbinds, unfolds, unclips, and repairs torn edges of the documents. The scanners can copy a page in a second if the document is in good condition. Brittle and onionskin papers take longer to prepare because they have to be inserted into transparencies to protect them during scanning.

The ADMS staff then extracts/groups the scanned pages according to the type of document in preparation for "indexing-tagging." Using a software, RMO indexes each document by filling in fields in the database that would tag each document based on information that facilitate document retrieval. After indexing, documents are automatically uploaded to the server.

The ADMS scanners use optical character recognition technology that recognize and extract computerized or typewritten texts from the document, making keyword and document search easier.

According to Mr. Allyson Calapine, RMO officer-in-charge, who supervises the digitization project, it now takes only one to two minutes to search for documents that are in the ADMS database, provided that the client gives the necessary keywords for easier searching. In the past, documents search took an hour to half a day; in some cases, several days.

Every day, RMO gains another "wealth" of documents. And with its keepers who see the value in every page that is entrusted to them, the rich history of the university continues to be preserved, this time in a digital treasure chest.



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With almost 2.4 million pages of official documents in its “treasure chest,” UPLB has accumulated a wealth of data and information since the late 1940s.

Some of these are minutes of meetings of important university bodies on major decisions that shaped the university through the years; contracts and reports that record campus milestones; correspondences and speeches of institution builders; and records of personnel who have served the university.

Graphics designed by Freepik

ADDING LIFE TO THE INSTITUTE OF BIOLOGICAL SCIENCES

MARK JAYSON E. GLORIA

It only took a Facebook post to mobilize a group of UPLB alumni in the Philippines and in the United States to furnish rooms in the newly constructed wing at the Institute of Biological Sciences (IBS).

The post, courtesy of Ivan Marcelo Duka, faculty member at IBS and college secretary of the College of Arts and Sciences, showed photos of bare rooms that would later become a conference room and a computer laboratory.

"I just posted it *ng wala lang*," Duka said about his post on social media of the interior of IBS' new wing that was constructed through a ten million-peso donation from Senator Richard Gordon, a UP law alumnus, and supplementary funds from UPLB.

What Duka did not expect was that his post on his personal account would trigger a show of support from his fellow "symbionts," as how the members of

Symbiosis: The UPLB Biological Society call themselves.

"When I saw the post, [I thought it] was the answer to my prayer," said Maggie Pamplona-Pelayo, BS Biology alumna and a symbiont who had once promised to herself to someday help IBS improve its facilities.

"I realized that I can only donate a small amount, so why not encourage the



other members of Symbiosis," Pelayo said. With ormgates Tina Francia and Ellen Togado-Florento and in close coordination with Duka and Dr. Merlyn Mendioro, director of IBS, Pelayo campaigned among her fellow symbionts to donate to IBS and opened a bank account to facilitate the initiative.

The "adopt-a-room" idea gained traction among Symbiosis alumni who organized themselves into the Symbiosis Global Foundation and raised half a million pesos that was used to purchase LED television, two split-type air conditioners, and furniture. Some of the money was also channeled to the IBS Microbiology Division to purchase laboratory equipment.

In gratitude, IBS named the two rooms "IBS-Symbiosis Conference Room" and the "IBS-Symbiosis Bioinformatics Laboratory."

The IBS-Symbiosis partnership is actually not the first effort of the alumni to "add life" to the Institute of Biological Sciences, a National Center of Excellence in the Basic Sciences, a Commission on Higher Education (CHED) Center of Excellence in Biology Education, and the first from UPLB to obtain a certification from the ASEAN University Network-Quality Assurance. Nor is it going to be the last.

IBS also decided to name the bridge that leads to the IBS-Symbiosis rooms as the UPLB-Alumni Group in America (AGA) Wing after its benefactor. According to Dr. Mendioro and Duka, the UPLB-AGA group, composed of US-based alumni and their friends, raised more than PhP 100,000 that funded the installation of floor tiles and purchase of furniture for another conference room.

Dr. Nacita Lantican, head of IBS Microbiology Division, added that a number of IBS alumni have initiated donations of different types, from equipment to thesis grants. One of these is US-based alumna, Dr. Florinda Piano, who, for the past three years, has been funding annually an undergraduate thesis of a microbiology major student. Alumni Drs. Cesar and Lourdes Nadala and Ma. Aussielita Lit have also made commitments to fund thesis support programs in the same field at IBS.

IBS produced a number of renowned professionals – medical doctors, scientists, researchers, teachers, executives, and public servants, to name a few. One by one, they are now giving back to their home institute, adding life to the halls where they learned to understand, value, and master the science of life.

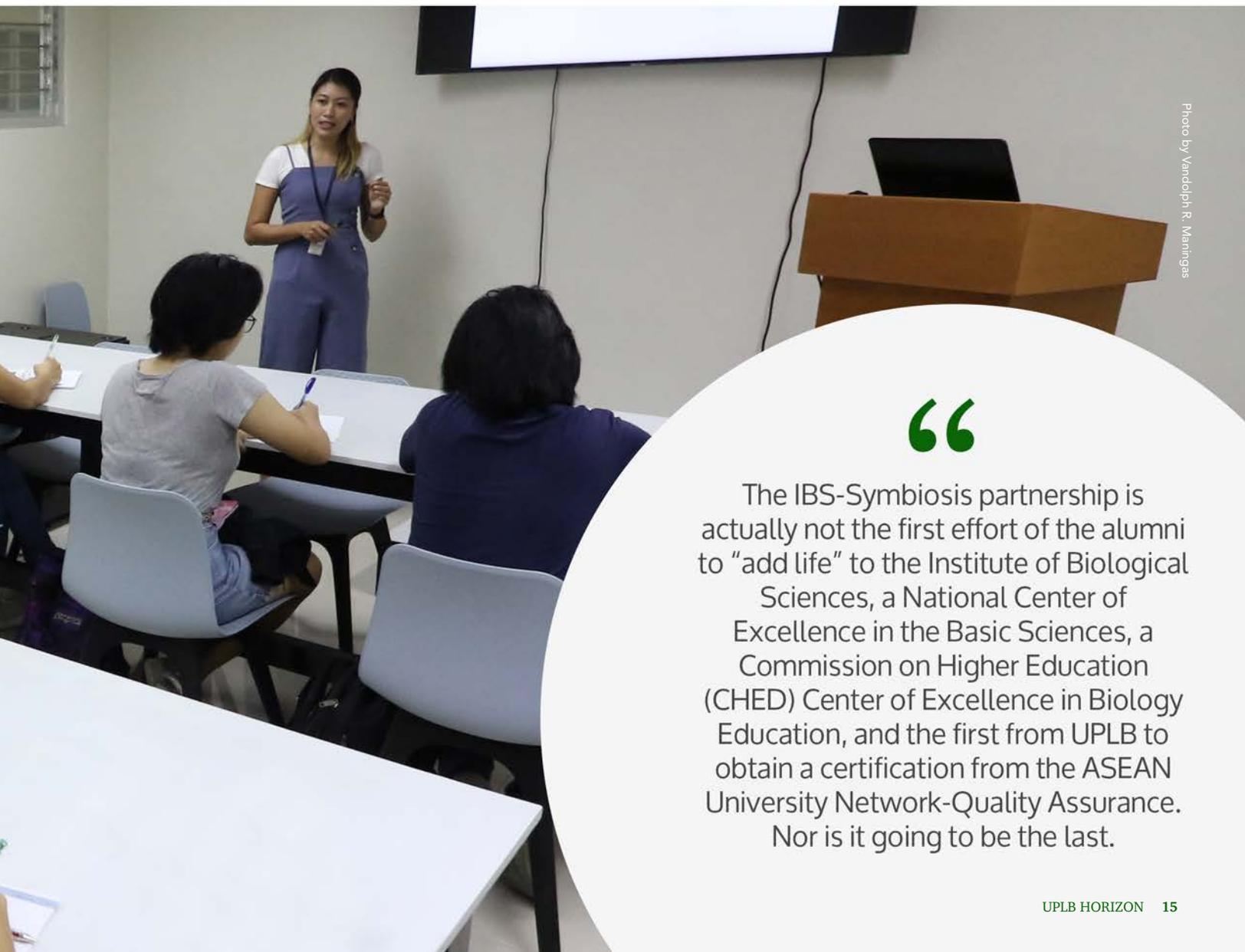


Photo by Vandolph R. Maningas

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CREATING RIPPLES OF KINDNESS

PAULLY MAY Z. VALENCIA

This is a story that needs to be told for the chance that doing so could lead to more acts of kindness.

It began with the decision to pay a kindness forward, as one UPLB alumnus did. A child of a public school teacher and a farmer, Nick Angel II struggled through college financed by a grant from the Department of Education augmented by his student assistantship pay.

When he graduated in BS Agriculture, he immediately began working for a multinational crop protection company. Eventually, he and a business partner put up a local company engaged in non-crop pesticides.

When Nick saw the UPLB Adopt-a-Student Program (AASP) posted on social media, he felt that it was his chance to pay forward the kindness of people who helped get him through college. He immediately got in touch with the UPLB Office of Student Affairs (OSA), which administers the program.

ADOPT-A-STUDENT FACILITY

On October 15, 2015, Chancellor Fernando C. Sanchez issued OC Memorandum No. 133 adopting and implementing UP Diliman's AASP in UPLB.

AASP is a financial assistance program aiming to help less fortunate but deserving students who are in their final year. The UPLB Committee on Scholarship and Financial Assistance (UPLB-CSFA) selects AASP grantees based on a set of criteria that considers academic standing/donor conditions and need.

OSA has since facilitated the award of PhP 1.252 million that has produced 23 graduates courtesy of 13 donors.

KIND AND KINDRED SPIRITS

Who would know how hard up students feel but a kindred spirit? Having been one himself, Nick said that he just

wanted to help students to focus on their studies, thus his donation to AASP.

"Studying in UP is difficult, and worrying about how to pay dorm fees or your next meal, or a requirement, makes it a lot harder. These problems make students quit," he said.

Nick has been donating for three years now and even convinced his boss to himself be a sponsor. His boss currently supports two students.

Joan Narciso, BS Chemistry class of 2006, decided to be an AASP sponsor because she realized that there are many students who are the only hope of their parents, families, and communities. "It is their dream to graduate from UP and help their families and communities. I am just doing a very small part so that their dreams may be fulfilled," she said.

Nick encourages fellow alumni to sponsor students. Donating, he said, could also help nurture the next generation of donors. "Imagine when this multiplies over time, reaching more students," Nick added.

ALTRUISM AND GRATITUDE BIND FRIENDSHIPS

Recipients build friendship with their donors with whom they stay in touch even after graduation. Harvey, a civil engineering student, felt so happy meeting his sponsor, Atty. Placida Venegas. "She is so concerned about the well-being of resource-poor students like me. I felt her genuine and heartfelt concern," Harvey intimated.

Via and her sponsor, Joan Narciso, have yet to meet each other. She would like to personally thank Joan for this big life-changing opportunity given to her.

Diana, BS Agriculture class of 2018 and one of Nick's scholars, said, "It was a great help because I had to

stop working as a student assistant in order to focus on my thesis.

"The AASP was a big help to me and I am very thankful to my sponsor, the UP Alumni Association Singapore chapter," said Ralph, a BS Agricultural Economics graduate of 2018.

PAYING IT FORWARD

Nick is very proud of his scholars. He said that they are very grateful and hope to do their turn in the future. His advice to them: "Remember what you went through during your stay in college and use this to make you stronger and to persevere to achieve your goals in life. Having had such experience will give you an advantage over those who had it easier."

Angelika (BS Development Communication, 2018), also a former scholar said, "I would love to be a channel of God's blessings to other people. I know a lot of Iskas and Iskos are striving hard to finish college for their loved ones, and I'd love to help them in the way I know best."

Another scholar, Maelyn, who graduated in BS Development Communication in 2018 said, "I had long dreamt of helping poor but deserving students. If one day I find myself in a position to help, I will not pass up the opportunity to pay my sponsor's kindness forward."

Indeed, kindness is like a pebble that when dropped into still waters, creates concentric ripples that could mean a sea of change in students' lives.



Photo by Christopher V. Labe

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READY TO BE PART OF AASP?

- Students, visit facebook.com/uplbosa
<https://uplbosa.org/scholarships>

- Sponsors, please inquire from Ms. Jenette Lory P. Tamayo, Head, OSA-SFAD
or Ms. Ivy Mary U. Selarde, Coordinator, Private and Government Scholarships
Section, OSA-SFAD, Room 6, 2nd floor, S.U. Bldg.

E-mail jlptamayo@uplbosa.org and imuselarde@uplbosa.org
Telephone numbers: (049) 536-3212 / 536-3209

FOR MORE INFORMATION, PLEASE CONTACT:

Office of the Chancellor
3rd Floor, BM Gonzalez Hall
University of the Philippines Los Baños
College, Laguna 4031 Philippines
Tel: (63-49) 536 2567 or 536 2894
Fax: (63-49) 536 3673, Email: oc.uplb@up.edu.ph

Office of Public Relations
2nd Floor, AG Samonte Hall
University of the Philippines Los Baños
College, Laguna 4031 Philippines
Tel Fax: (63-49) 536 3604
Email: opr.uplb@up.edu.ph

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