



MAPÚA UNIVERSITY | SUSTAINABLE DEVELOPMENT GOALS REPORT



MAPÚA UNIVERSITY

SUSTAINABLE DEVELOPMENT GOALS

2018-2019 REPORT SYNOPSIS

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MAPÚA
UNIVERSITY

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WORDS FROM THE PRESIDENT



Reynaldo B. Veal
Dr. Reynaldo B. Veal

**President
Mapúa University**

“As an educational institution it is very important that Mapúa dedicates itself to serving the community in order to stay relevant. In the particular case of sustainability concerns, Mapúa’s involvement is furthermore driven by the realization that the university’s future is inextricably bound to that of human society. Climate change affects us all. Responding to it should involve us all.”

SUSTAINABLE DEVELOPMENT GOALS

1 NO
POVERTY



2 ZERO
HUNGER



3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



5 GENDER
EQUALITY



6 CLEAN WATER
AND SANITATION



7 AFFORDABLE AND
CLEAN ENERGY



8 DECENT WORK AND
ECONOMIC GROWTH



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



10 REDUCED
INEQUALITIES



11 SUSTAINABLE CITIES
AND COMMUNITIES



12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



13 CLIMATE
ACTION



14 LIFE
BELOW WATER



15 LIFE
ON LAND



16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS



SDG

Fig. 12. Flood Hazard Map of M (2048)

Fig. 12. Flood Hazard map of M (2048)

1 - Australia <ul style="list-style-type: none"> Royal Melbourne Institute of Technology 	6 - Greece <ul style="list-style-type: none"> University of Thessaly 	<ul style="list-style-type: none"> Institut Teknologi Bandung University of 17 Agustus 1945 	13 - Kenya <ul style="list-style-type: none"> UNEP GUPES
2 - Bulgaria <ul style="list-style-type: none"> Varna University of Management 	7 - Iceland <ul style="list-style-type: none"> Reykjavik University 	10 - Ireland <ul style="list-style-type: none"> WestBIC 	14 - Malaysia <ul style="list-style-type: none"> Universiti Tenaga Nasional
3 - Canada <ul style="list-style-type: none"> The University of Western Ontario 	8 - India <ul style="list-style-type: none"> Suresh Gyan Vihar University Amity University Madhya Pradesh SRM Institute of Science and Technology Delhi Technological University 	11 - Italy <ul style="list-style-type: none"> Deus Technology University of Studies Guglielmo Marconi 	15 - Singapore <ul style="list-style-type: none"> DHI Water and Environment Pte., Ltd.
4 - China <ul style="list-style-type: none"> Sichuan University of Science and Engineering Tongji University 	9 - Indonesia <ul style="list-style-type: none"> Binus University 	12 - Japan <ul style="list-style-type: none"> Osaka University 	16 - South Korea <ul style="list-style-type: none"> Dong A University Seoul National University of Science and Technology University of Science and Technology
5 - France <ul style="list-style-type: none"> Ecole Nationale Des Travaux Publics De l'etat 			



17 PARTNERSHIPS FOR THE GOALS



MAPÚA INTERNATIONAL LINKAGES FOR RESEARCH AND DEVELOPMENT

17 - Serbia <ul style="list-style-type: none"> University of Belgrade 	<ul style="list-style-type: none"> National Cheng Kung University National Tsing Hua University National Chiao Tung University National Sun Yat-sen University Taiwan Water Conservancy National I-Lan University Chang Jung Christian University SER Laboratories National Taiwan University Tainan Hydraulics Laboratories 	<ul style="list-style-type: none"> Taiwan Water Corporation SER Journal National Taipei University of Technology National Chung Cheng University Meiho University 	<ul style="list-style-type: none"> Glasgow Caledonian University
18 - Sweden <ul style="list-style-type: none"> KTH Royal Institute of Technology 			22 - USA <ul style="list-style-type: none"> Environmental Strategies International Old Dominion University Rowan University
19 - Taiwan <ul style="list-style-type: none"> Chia Nan University of Pharmacy and Science Chung Yuan Christian University National Kaohsiung University of Science & Technology National Pingtung University of Science & Technology National Taiwan University of Science & Technology 		20 - Thailand <ul style="list-style-type: none"> Chulalongkorn University 	23 - Vietnam <ul style="list-style-type: none"> Ho Chi Minh Open University Hue University University of Economics and Business of Vietnam National University
		21 - UK <ul style="list-style-type: none"> University of Glasgow 	

INTERNATIONAL PARTNERS FOR THE GOALS



National Tsing Hua University, Hsinchu, Taiwan



Varna University, Bulgaria



Rowan University, USA



Osaka University, Japan

INTERNATIONAL PARTNERS FOR THE GOALS



Co-funded by the
Erasmus+ Programme
of the European Union

Building Entrepreneurial Ecosystems to Enhance Higher Education Value-Added for Better Graduate Employability



INTERNATIONAL PARTNERS FOR THE GOALS



2018 International Conference on Sustainable Environmental Technologies (ICSET 2018)

Mapúa University, Intramuros, Manila, Philippines
August 19-21, 2018

<https://icset2018.mapua.edu.ph/>

Mapúa University, in cooperation with Taiwan's National Cheng Kung University and Chia Nan University of Pharmacy and Science, hosted the 2018 International Conference on Sustainable Environmental Technologies (ICSET) on August 19-21, 2018. The conference tackled innovation, technopreneurship, and sustainable environmental technologies.

INTERNATIONAL PARTNERS FOR THE GOALS



Mobile Laboratory Prompt Detection and Analysis for Environmental Quality Monitoring

INTERNATIONAL PARTNERS FOR THE GOALS



NATIONAL PARTNERS FOR THE GOALS



1 NO
POVERTY



**END POVERTY
IN ALL ITS FORMS**

Community Anti-Poverty Activities



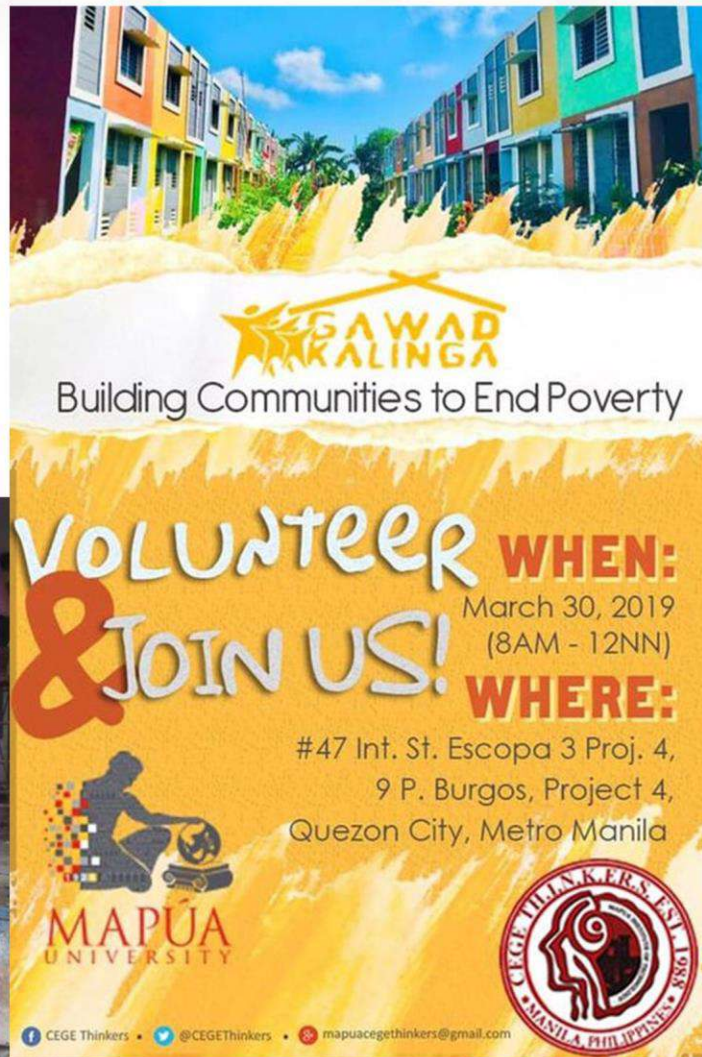
PERiCCo is a group of ordinary self-employed workers (Grab, Lalamove, Angkas, and other delivery riders) who are committed to become entrepreneurs and determined to give a new definition of work and new dimension of service. With the assistance of Mapúa University's E.T. Yuchengco School of Business and Management, the group was recognized as a cooperative and was officially registered under the Cooperative Development Authority. This helped them achieve their objective to become entrepreneurs and at the same time realize the value of helping people through means of service.



**PERiCCo:
Pinoy Entrepreneur Riders Consumers Cooperative**

Gawad Kalinga - Mapúa volunteers to End Poverty

Mapúa University's School of Civil, Environmental, and Geological Engineering – TechNological Improvement for a New and Keen EngineeRing Student (SCEGE-THINKERS) participated in Gawad Kalinga's 'Building Communities to End Poverty'. Here, the students and faculty members helped build houses for the poor and those in vulnerable situations.



2 ZERO
HUNGER



**End hunger, achieve food security
and improved nutrition and
promote sustainable agriculture**

Community Urban Gardening



The Office for Social Orientation and Community Involvement Programs (SOCIP) of Mapúa University arranged a program about educating the communities of Brgy. 860 & 872, Pandacan, Manila on practicing cultivation in urban areas. This is one way to help the communities to reduce food insecurity and to promote sustainable agriculture in the comfort of their own homes and backyards.

Affordable and nutritious food choices

Julie's™
BAKESHOP



**fruit
magic**

The fastest way to a fit lifestyle!

VMES CANTEEN

Mapúa University's canteen has a variety of food outlets that are affordable and nutritious. Some of these are Julie's Bakeshop that serves affordable Filipino baked breads, Fruit Magic that serves organic beverages such as natural juices with no additives, sugar and preservatives, and VMES canteen with its appropriately portioned food meals.

CAMPUS FOOD WASTE MONITORING

Mapúa University creates policies and plans to avoid excessive food waste. This strategy monitors the amount of left-over food generated from the food served within the campus. This contributes to the attainment of Sustainable Development Goal 2 – Zero Hunger.

A. FOOD WASTE

Month / Year	Weight (Metric Ton)
January 2019	1.04
February 2019	1.54
March 2019	1.85
April 2019	0.69
May 2019	1.07
June 2019	1.01
July 2019	1.56
August 2019	1.24
September 2019	1.44
October 2019	0.88
November 2019	1.20
December 2019	0.24



To ensure healthy lives and promote wellbeing for all at all ages

Mapúa University - Cardinal Health Corner

DENTAL HEALTH AWARENESS



FAKE BRACES

— WHY DO SOME PEOPLE WEAR THEM? —



As a teeth straightening attempt



As a fashion accessory



As a costume accessory

— RISK AND DANGERS —



Mouth sores & infection



Tooth decay & tooth loss



May cause choking



Toxic metals that may contain lead



Can cause permanent damage

NO ONE OTHER THAN A SPECIALLY TRAINED ORTHODONTIST SHOULD BE ADJUSTING YOUR TEETH



Hepatitis B Everything you need to know about it

What Is Hepatitis B?

Hepatitis B is an infection of your liver. It can cause scarring of the organ, liver failure, and cancer. It can be fatal if it isn't treated.

It's spread when people come in contact with the blood, open sores, or body fluids of someone who has the hepatitis B virus.

It's serious, but if you get the disease as an adult, it shouldn't last a long time. Your body fights it off within a few months, and you're immune for the rest of your life. That means you can't get it again. But if you get it at birth, it's unlikely to go away.



What Are the Symptoms of Hepatitis B?

When you're first infected, the warning signs include:

- Jaundice. (Your skin or the whites of the eyes turn yellow, and your pee turns brown or orange.)
- Light-colored poop
- Fever
- Fatigue that persists for weeks or months
- Stomach trouble like loss of appetite, nausea, and vomiting
- Belly pain



How Do You Prevent Hepatitis B From Spreading?

To help keep a hepatitis B infection from spreading:

- **Don't have sex** (if you haven't already been infected).
- **Wash gloves** when you clean up after others, especially if you have a toothbrush, syringe, and lancet.
- **Cover all open cuts or wounds.**
- **Don't share razors, toothbrushes, nail care tools, or pierce needles with anyone.**
- **Don't share chewing gum, and don't pre-chew food for a baby.**
- **Make certain that any needles for drugs, war planning, or tattoos — or tools for manicures and pedicures — are properly sterilized.**
- **Clean up blood** with one part household bleach and 10 parts water.



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Munla St., Pasay City, Manila, Philippines
Tel. No. +63 (2) 247-5000 loc. 4102

HEALTH ADVISORY DENGUE



Dengue fever and dengue hemorrhagic fever are acute viral infections that affect infants, young children, and adults.

Cause

Bite of an Aedes aegypti mosquito infected with any one of the four dengue viruses.

Treatment

- Do not give aspirin for fever.
- Give sufficient amount of water or rehydrate a dengue suspect.
- If fever or symptoms persist for 2 or more days, bring the patient to the nearest hospital.

Signs and Symptoms

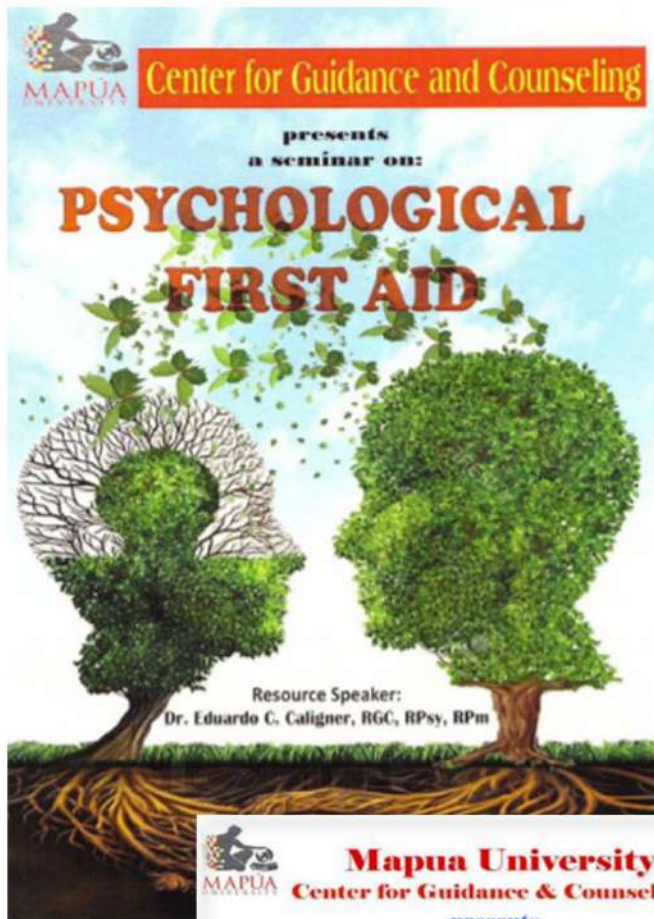
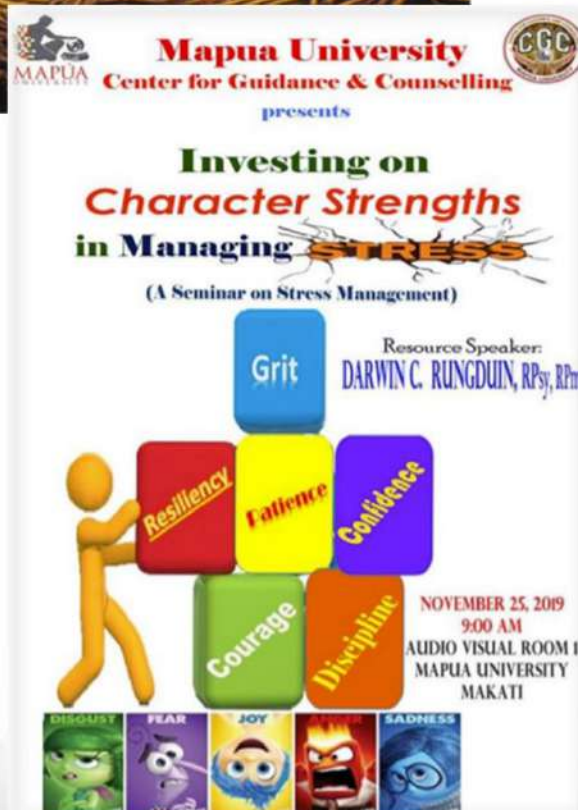
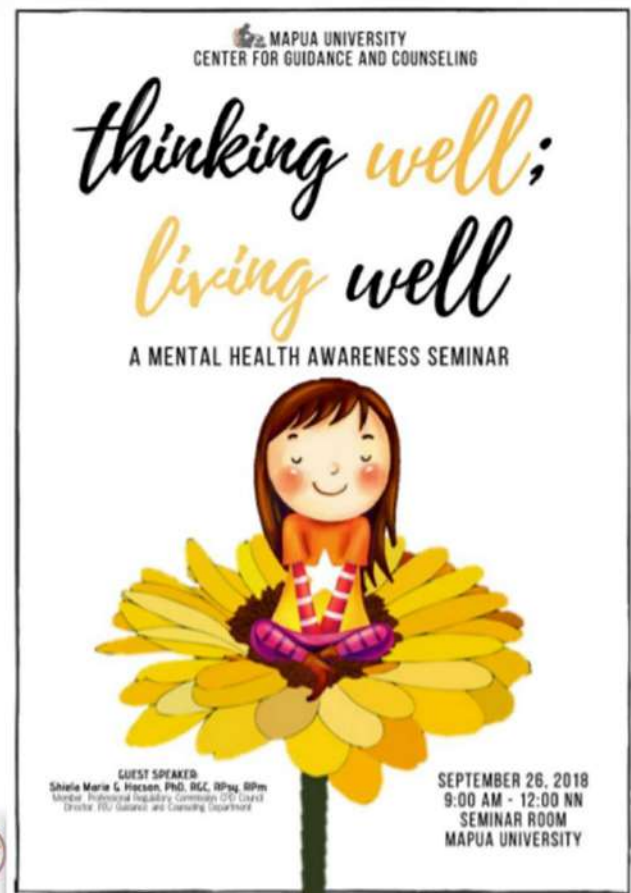
- Sudden onset on high fever which may last from 2 to 7 days.
- Joint and muscle pain and pain behind the eyes
- Weakness
- Skin rashes
- Nose bleeding when fever starts to subside
- Abdominal pain
- Vomiting of coffee-colored matter
- Dark-colored stools
- Difficulty of breathing

PREVENTION & CONTROL FOLLOW THE 4S AGAINST DENGUE

1. Search and Destroy
2. Self-protection Measures
3. Seek Early Consultation
4. Say Yes to Fogging When There is an Impending Outbreak or a Hotspot

Mapúa University's students and employees have free access to medical and dental health services provided by the Health Services Department. Health-related infographics, called Cardinal Health Corner, are circulated to all stakeholders on a regular basis via email. These ensure and promote the well-being of students and employees of the university.

Mental Health Wellness Seminars



Mapúa University's Center for Guidance and Counseling raised awareness on mental health wellness among students and employees by organizing seminars that provided information on and approaches to addressing different kinds of mental health issues.

Preventing diseases in all ages



Students from Mapúa University's NSTP classes held awareness lectures for children in all ages from Barangay 872 in Pandacan, Manila, to teach them how to treat and prevent diseases such as dengue fever and leptospirosis through cleanliness and proper hygiene.





Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Capacity Building for teachers on lifelong learning implementation



 **STEM teach MAPÚA**



Mapúa University, adding to its efforts in implementing quality online education, launched STEM Teach Mapúa, a teaching-learning innovation which provides free online teaching enhancement trainings for Senior High School (SHS) teachers. STEM Teach Mapúa offers online courses in Biology, Chemistry, Physics, Calculus, and Statistics subjects to enhance expertise of teachers under the Science, Technology, Engineering, and Mathematics (STEM) strand of the senior high school education.



Inclusive learning opportunities for all

Faculty members of the school of Chemical, Biological, and Materials Engineering and Sciences (CBMES) imparted their knowledge and shared their time to educate the Aeta community in Pampanga during the LIYAB WASTE ED SERIES, a day-long series of educational discussion and workshops organized by 2030 Youth Force in the Philippines, Inc. and Sikat Solar Foundation, Inc. promoting equitable learning opportunities for the community.



5 GENDER EQUALITY



Achieve gender equality and empower all women and girls

VIENCE DE TAZA

Team Manager
Of Urban Concept
HIRAYA II

HIRAYA II was one of Mapúa University's project eco-cars competing in the Shell Eco-Marathon. Developing this required heavy works and mechanical skills that were formerly known to be only men's expertise. Through the project, the university encouraged female students to participate in activities popular among male students. HIRAYA II's team manager was a female Mechanical Engineering student named Vince De Taza.

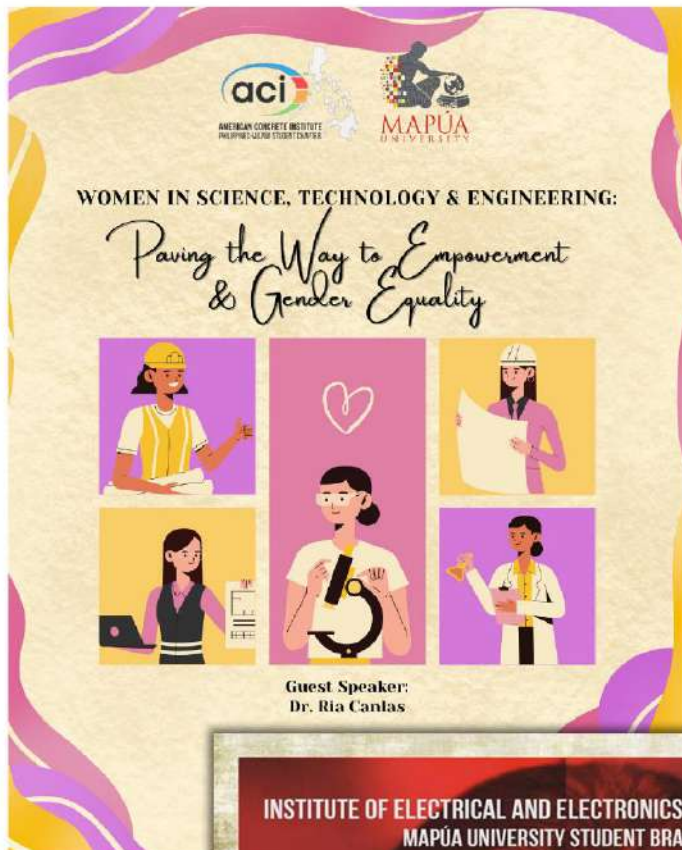


Co-funded by the
Erasmus+ Programme
of the European Union

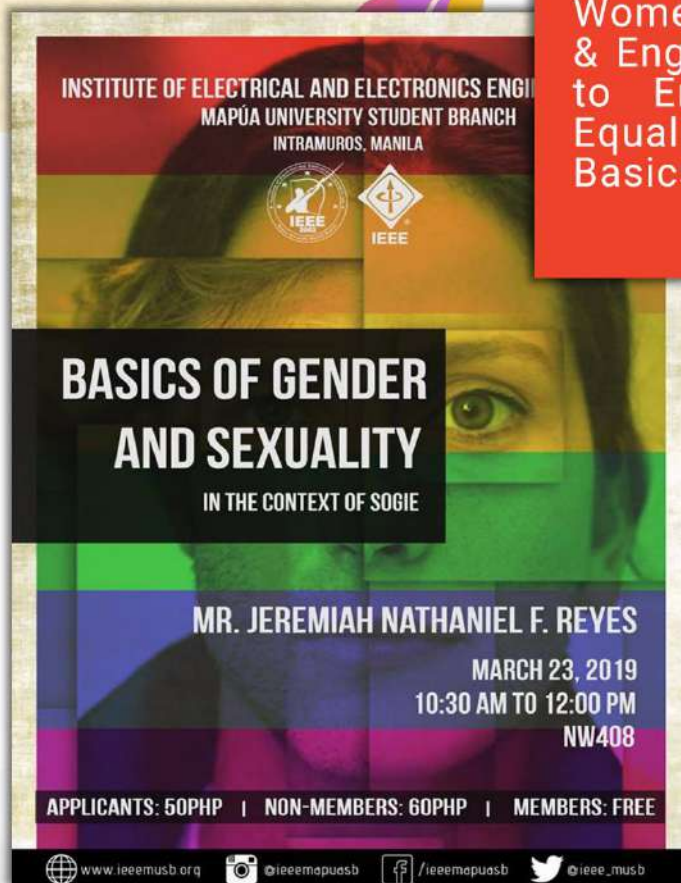


Mary Christine A. Tomas, Director of the Center for Teaching and Learning, leads the IT-related works, including the online accelerator program, for the Building Entrepreneurial Ecosystems to Enhance Higher Education Value-Added for Better Graduate Employability (BEEHIVE) project co-funded by the European Union Erasmus Plus Programme.

Women Empowerment and Gender Equality Seminars



Different organizations of Mapúa University also took part in attaining the goal towards empowering women and girls, and having equalities between different genders and sexuality. Some of the examples for this are the Women in Science, Technology & Engineering: Paving the Way to Empowerment & Gender Equality and the seminar on the Basics of Gender and Sexuality.



6 CLEAN WATER AND SANITATION



Ensure availability and sustainable management of water and sanitation for all

Improvement of Water Quality and Sustainability



Taiwan - Philippines

Joint Water Quality Research and Innovation Center

2019 International Symposium on Water and Sediments Quality



Several workshops and seminars on Water and Sediments Quality Improvement held in YIC-Research Laboratory 3, Mapúa University, Manila, were organized by Taiwan-Philippines Joint Water Quality Research and Innovation Center (TPWRIC) and Office of International Linkages for Research and Development (ILRAD)

Date: August 15-16, 2019 | 8:30 AM - 5:30 PM
Venue: RLab 3, Yuchengco Mapúa University



These events focused on research studies that had the same goal of ensuring the sustainability and quality of water.

Water and sanitation management: Detection of Cyanobacteria



Taiwan-Philippines Joint Water Quality Research and Innovation Center (TPWRIC) and the Office of International Linkages for Research and Development (ILRAD) also organized a seminar tackling the detection and investigation of cyanobacteria in water bodies (e.g. Laguna lake). This raised possible solutions for water management and sanitation especially on its domestic use.



Joint Project for Laguna Lake Mapua and NCKU

- In August 2016, the NCKU and Mapúa jointly conducted a project for monitoring the water quality of Laguna Lake.
- This research project is the **first-ever in-depth investigation** on harmful cyanobacteria and its metabolites for Laguna Lake, the biggest inland water in the Philippines.
- The results of this investigation confirmed the presence of **high abundance of cyanobacteria**, **considerable concentrations of cyanotoxins**, **taste and odor compounds** and other cyanobacteria metabolites in the lake.

7 AFFORDABLE AND CLEAN ENERGY



Ensure access to affordable, reliable, sustainable, and modern energy for all

Renewable Energy Innovation and Leadership Experience



RENEWABLE ENERGY INNOVATION AND LEADERSHIP EXPERIENCE

PROGRAM SCHEDULE
JUNE 21 - JULY 12, 2019

**REGISTRATION IS ONGOING.
JOIN NOW!**

f @MapuaUniv
@mapuainternationalprograms

www.mapua.edu.ph

Mapúa University and PetroEnergy Resources Corporation (PERC), affiliates of the Yuchengco Group of Companies (YGC), launched the international summer training program on renewable energy (RE). Dubbed as Renewable Energy Innovation and Leadership Experience (REILE), the 3-week course is designed to provide future energy leaders with the conceptual foundations and introductory practical knowledge in Renewable Energy Systems, technologies, and operations while providing students the opportunities to tour the Philippine countryside.



Plant-Microbial Fuel Cells as Renewable Energy Sources



Engr. Kristopher Ray S. Pamintuan presented two studies during the ICWRE 2018 about prospective sustainable energy sources from aquatic plant-microbial fuel cells. Entitled “Stacking of aquatic plant-microbial fuel cells growing water spinach (*Ipomoea aquatica*) and water lettuce (*Pistia stratiotes*)” and “Simultaneous phytoremediation of Ni^{2+} and bioelectricity generation in a plant-microbial fuel cell assembly using water hyacinth (*Eichhornia crassipes*)”.

The 4th International Conference on Water Resource and Environment (WRE 2018) IOP Publishing
IOP Conf. Series: Earth and Environmental Science **191** (2018) 012054 doi:10.1088/1755-1315/191/1/012054

Stacking of aquatic plant-microbial fuel cells growing water spinach (*Ipomoea aquatica*) and water lettuce (*Pistia stratiotes*)

K R S Pamintuan^{1,3}, J A A Clomera², K V Garcia², G R Ravara² and E J G Salamat²

¹School of Chemical, Biological, and Materials Engineering and Sciences, Mapua University, Intramuros, Manila, 1002, Philippines

²Senior High School Department, Mapua University, Intramuros, Manila, 1002, Philippines

E-mail: krsamintuan@mapua.edu.ph

The 4th International Conference on Water Resource and Environment (WRE 2018) IOP Publishing
IOP Conf. Series: Earth and Environmental Science **191** (2018) 012093 doi:10.1088/1755-1315/191/1/012093

Simultaneous phytoremediation of Ni^{2+} and bioelectricity generation in a plant-microbial fuel cell assembly using water hyacinth (*Eichhornia crassipes*)

K R S Pamintuan^{1,3}, A J S Gonzales², B M M Estefano² and B L S Bartolo²

¹School of Chemical, Biological, and Materials Engineering and Sciences, Mapua University, Intramuros, Manila, 1002, Philippines

²Department of Senior High School, Mapua University, Intramuros, Manila, 1002, Philippines

E-mail: krsamintuan@mapua.edu.ph

Clean Energy: Micro-Hydro Generator for Small Indigenous Community



The University continuously supports the indigenous Dumagat community of Rizal province in maintaining the previously installed Micro-Hydro Generator which provides clean energy. The clean energy is utilized by the community offices during daytime while it is used to light main roads during night time.



Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Mapúa-BEEHIVE Accelerator Program



Wizher Inc.



Antipara Exploration Inc.



IdeaSpace Foundation Inc.

The Building Entrepreneurial Ecosystems to Enhance Higher Education Value-Added for Better Graduate Employability (BEEHIVE) project, funded through the Erasmus+ Capacity Building in Higher Education, organized a forum: BEEHIVE Accelerator Program Launching last March 13, 2019. This forum was joined with Mr. Edel Tolentino Alva of Wizher Inc., Ms. Cherry Murillon-Cubacub of Antipara Exploration Inc., and Ms. Brenda Valerio of IdeaSpace Foundation Inc. They shared their entrepreneurial experiences and knowledge that have same objectives with BEEHIVE on enhancing the abilities and skills in creating jobs, and the productive employment of students and graduates from the higher education.



Mapúa University: Career Expo

During the Mapúa University's Career Expo on December 2018, Mapúa had 63 of the biggest companies in the country to offer employment for Mapúa's fresh graduates. Mapúa University held its 2nd Leg of 2019 Career Expo (Job Fair) under the theme "XCIV: eXcellence. Innovation. Value." on June 18, 2019 at Mapúa Gymnasium, Intramuros Campus.

The career expo brought together the finest employers, world-class Mapúa alumni, entry level talented individuals and excellent graduating students. This university's initiative addresses the sustainability goal of providing decent work that will result in the growth of the economy.



CAREER EXPO 2018
4TH LEG
UNITY IN DIVERSITY
DECEMBER 11, 2018 | 10:00AM – 5:00PM
MAPÚA GYMNASIUM, INTRAMUROS CAMPUS

LIST OF PARTICIPATING COMPANIES

ACCENTURE, INC.	INTEGRATED COMPUTER SYSTEMS, INC.
AIRSPED INTERNATIONAL CORPORATION	JG SUMMIT PETROCHEMICAL CORPORATION
ALVED LAND CORPORATION	JOBSTREET.COM PHILIPPINES, INC.
AMKOR TECHNOLOGY PHILS., INC.	KEYENCE PHILIPPINES, INC.
ANALOG DEVICES GEN.TRIAS, INC.	LAND BANK OF THE PHILIPPINES
ASIA UNITED BANK	LBP SERVICE CORPORATION
AVALOQ PHILIPPINES OPERATING HEADQUARTERS	LITTELFUSE PHILIPPINES, INC.
AZEUS SYSTEMS PHILIPPINES LIMITED	LIZARDBEAR TASKING, INC.
BAUER FOUNDATIONS PHILIPPINES, INC.	MAKATI DEVELOPMENT CORPORATION
BDO UNIBANK, INC.	MAXIMA MACHINERIES, INC.
BITMICRO NETWORKS INTERNATIONAL, INC.	MEGAWORLD CORPORATION
CCK CITY NETWORK INCORPORATED	METRO PACIFIC TOLLWAYS MANAGEMENT SERVICES INC.
CEBU PACIFIC AIR	METRO STONERICH CORPORATION
CITCO INTERNATIONAL SUPPORT SERVICES LTD.	MISYS PHILIPPINES, INC.
COMM TREND CONSTRUCTION CORPORATION	NGCP
D.M. CONSUNJI INC.	NOKIA TECHNOLOGY CENTER PHILIPPINES INC.
DOT KONSTRUCT, INC.	OPENTEXT PHILIPPINES, INC.
DENSO TEN SOLUTIONS PHILIPPINE CORPORATION	PHILIPPINE BATTERIES INCORPORATED
EMERSON ELECTRIC ASIA LTD- ROHQ	PHOENIX PETROLEUM PHILIPPINES, INC.
ERGO CONTRACTS PHILIPPINES, INC.	PMFTC, INC.
ETON PROPERTIES PHILIPPINES, INC.	ROCKWELL LAND CORPORATION
FACTSET PHILIPPINES INC.	SAN MIGUEL BREWERY, INC.
FORTHWORTH INC.	SAS INSTITUTE (PHILIPPINES) INC.
FUJITSU ENGINEERING TECHNOLOGIES PHILIPPINES, INC.	SCHNEIDER ELECTRIC LOGISTICS ASIA PTE LTD
GEMALTO TECHNOLOGIES, INC.	SHOPPING CENTER MANAGEMENT CORPORATION
GENSAI CAREER CONSULTING CORP.	SYKES ASIA INC.
GLOBAL ESTATE RESORTS INC.	SYNPUSE PHILIPPINES INC.
GOLDLOCKS BAKESHOP INC.	TREND MICRO INC.
HOWWAY PHILIPPINES, INC.	VIATECHNIK INC.
HUIWEI TECHNOLOGIES PHILIPPINES INC.	WEBB FONTAINE GROUP FZ-LLC, MANILA BRANCH
IBM	WV ENTERTAINMENT INC.
ICTJOB PHILIPPINES, INC.	



CAREER EXPO 2019
2ND LEG
Excellence. Innovation. Value.
JUNE 18, 2019 | 10:00AM – 5:00PM
MAPÚA GYMNASIUM, INTRAMUROS CAMPUS

CONTACT INFORMATION

CENTER FOR CAREER SERVICES
Admissions Office, GF, South Building
Muralla Street, Intramuros, Manila
Tel.: 247-5000 local 1202/1404
Fax: 336-6102
career_services@mapua.edu.ph

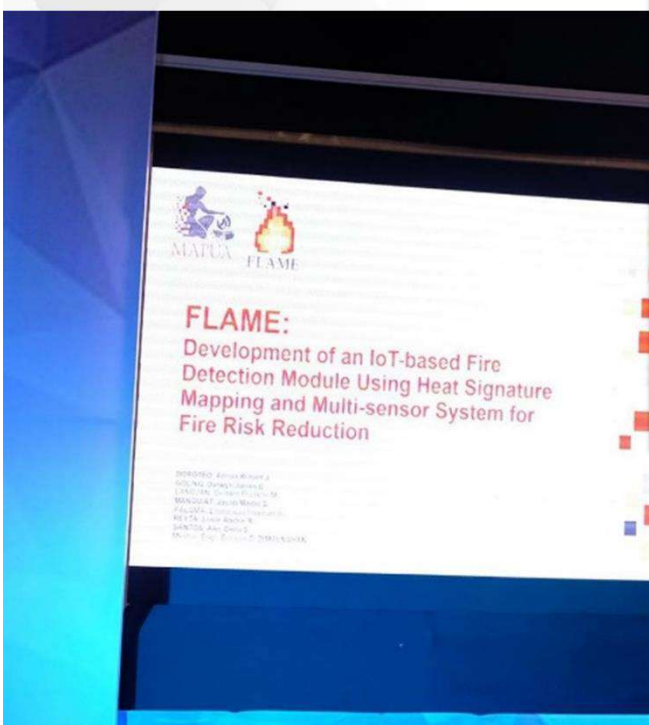
careerlink.mapua.edu.ph

[mapuacenterforcareerservices](https://www.facebook.com/mapuacenterforcareerservices)
[mapua_ccs](https://www.instagram.com/mapua_ccs)



Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Mapúa University's Team FLAME (Fire Luminosity and Multisensory Equipment), composed of senior high school students and their adviser Engr. Ericson Dimaunahan, developed a resilient innovation. This is an internet-based (IoT) Fire Detection Module using a Heat Signature Mapping and Multi-Sensor System that aims to mitigate fire disasters to save lives and protect properties. The device and system is capable of sensing multiple fire hazards and prevents false alarms by autonomously analyzing the heat signatures shown in the heat map.



SMARTBRIDGE: Inclusive innovation for structural sustainability

Dr. Francis Aldrine Uy of Mapúa University won in this category with his project, The Development of Wireless Sensory Network System for Structural Health Monitoring of Bridges (SMARTBRIDGE), now known as the Universal Structural Health Evaluation and Recording System (USHER). It is a weather and theft-proof system that enables us to remotely monitor the structural soundness of our bridges and buildings in real-time, helping determine if our bridges are in need of a repair or an upgrade, or if it is strong enough to withstand natural disasters.



10 REDUCED
INEQUALITIES



Reduce inequality within and among countries

International Field Study and Research Program (IFSR)



The Office of International Linkages for Research and Development organized a 3-week program called the International Field Study and Research Program (IFSR). This offers equal opportunities for students from foreign university partners to share and exchange ideas and collaborate on research that mainly focuses on sustainability, resiliency, and fieldwork activities with countryside cultural experiences.

Students who participated in IFSR2019 expressed that this program of Mapúa University was truly educational and created new knowledge and friendships through new learning experiences and exposure to new culture.

Student Feedback

Below are some testimonials of the IFSR 2019 participants:



Ebba Astrid Wilsby

KTH Royal Institute of Technology, Sweden

"Taking part of the IFSR-program is something I do not regret and I hope to carry all my new founded knowledge and friendships with me for the rest of my life."



Bongumenzi Mvuselelo Manana

National Taiwan University of Technology, Taiwan

"The IFSR was truly educational and informative and has surely broadened the spectrum of engineering tools I can use in the future to solve identical problems in my current field as Environmental Engineer."



Vo Thi Dieu Hien

National Kaohsiung University of Science and Technology, Taiwan

"I have learned a great deal of new knowledge in this program. After taking for about three weeks, I have realized that I had made a significant contribution to my research fields. In addition, this has created a good international exchange environment where we can share and learn experiences, knowledge, and culture."

International Industrial/Academic Leadership Experience Program (II/ALE)



A Chemical Engineering student of Mapúa University - School of Chemical, Biological, and Materials Engineering and Sciences participated in International Industrial/Academic Leadership Experience Program (II/ALE) in Taiwan. This was a summer camp that included lectures, group projects, and multiple excursions for foreign students. These activities were intended to expose the foreign students to various cultures and traditions. Also, the activities promoted equality among students from various countries.



The universities that participated in the program were Mapúa University (Philippines), Tokyo Denki University (Japan), Atma Jaya Catholic University (Indonesia), University of Wisconsin (USA), Iowa State University (USA), San Jose State University (USA), and Chung Yuan Christian University (Taiwan).

11 SUSTAINABLE CITIES AND COMMUNITIES



Make cities and human settlements inclusive, safe, resilient and sustainable

D-HIVE and VAPERS: Towards the goal of community resiliency and reduce vulnerability



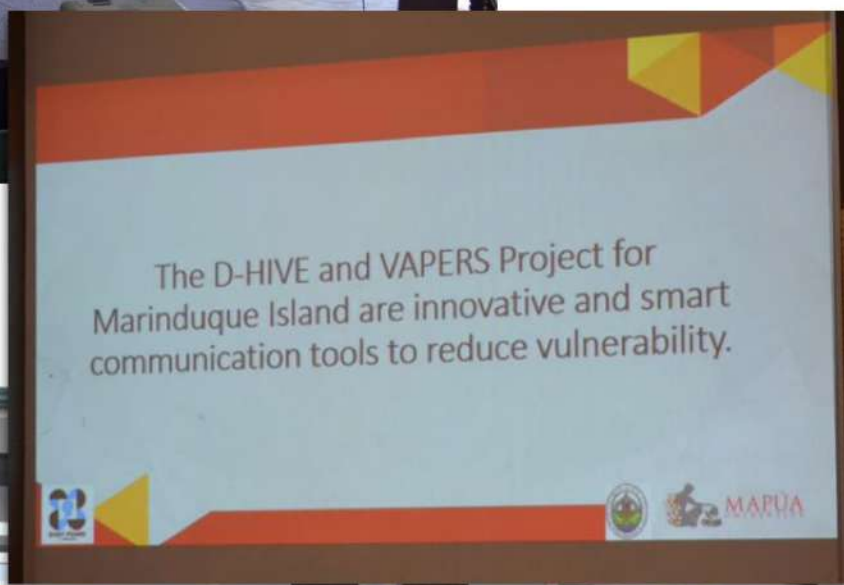
Development of Health Index: Vulnerability to Extreme Environmental Events for Marinduque Island (D-HIVE)

D-HIVE is a research and development project funded by the Department of Science and Technology – Philippine Council for Health Research and Development (DOST-PCHRD). This project aims to develop Health Vulnerability Indices (HVI) for Marinduque Island coupled with an emergency response system.



FOR MORE INFORMATION:

please email Dr. Delia B. Senoro at dbsenoro@mapua.edu.ph



Simulating Cascading Rainfall-induced Landslide Hazards in the Philippines (SCaRP)



The project entitled, "Simulating Cascading Rainfall-induced Landslide Hazards in the Philippines (SCaRP)" is funded by the Department of Science and Technology (DOST-PCIEERD) and UK NERC through Newton Agham. The project aims to understand relationship between landslide events, meteorological drivers, and preconditioning landslide factors in the country in order to predict landslides and relate them to sediment delivery rates to nearby river systems. These studies can help reducing vulnerability of the communities and increase their resiliency.



Ensure sustainable consumption and production patterns

Recycling packaging wastes to a sustainable composite product



Recycling is among the sustainability programs of Mapúa. The University provides racks to encourage everyone in the campus to segregate wastes on-site. Ensuring production patterns, the University embedded the waste management practice into research. The waste is a flexible packaging laminate trimmings which were processed into a composite regenerated material analyzed and results showed that these materials are useful as building component and as a water and gas vapor barrier.



Waste management system around campus



Keeping up with Mapúa University's waste management initiative, the students, faculty and personnel continue to follow waste segregation strategies through provided channels such as labelled trash bins all throughout the campus. These waste materials including cardboard boxes, plastic packages, PET bottles, glass bottles, aluminum cans and such are then turned over to a bigger recovery and recycling facility.





Take urgent action to combat climate change and its impacts

A study on the impact of climate change on a river basin in the Philippines

E3S Web of Conferences **117**, 00005 (2019)
ICWREE2019

<https://doi.org/10.1051/e3sconf/201911700005>

Impact of Climate Change on the Frequency and Severity of Floods in the Pasig-Marikina River Basin

Cris Edward Monjardin^{1*}, Clarence Cabundocan¹, Camille Ignacio¹ and Christian Jedd Tesnado¹

¹School of Civil, Environmental and Geological Engineering, Mapua University, 1002 Intramuros Manila, Philippines

Abstract. This study assessed impacts of climate change on the frequency and severity of floods in the Pasig-Marikina River basin. Researchers used the historical data from PAG-ASA (Philippine Atmospheric, Geophysical and Astronomical Services Administration), specifically from Science Garden weather station. The historical data are coupled with a global climate model, the Hadley Center Model version 3 (HadCM3) to account for the natural variability of the climate system in the area. The observed data and the hydroclimatic data from HadCM3 was processed in Statistical Downscaling Model (SDSM) that results to rainfall data from 1961-2017 and change in temperature data from 2018-2048. A rainfall time series for the river basin was generated considering average seasonal effects in the area. A flood frequency curve was modelled. From that, flood value for 2048 was derived to be at 3950cu.m/s. Additionally, the rapid urbanization in the area has contributed to the changes in the river system making it more vulnerable to floods. The results of this study supports the claim that the Pasig-Marikina River basin will be affected by the climate variability in terms of the increase in rainfall depth and average temperatures, higher flood frequency and more massive floods in the future. This study could help local government units to enforce improvement and mitigation in their area to prevent these from happening.

Members of Mapúa University School of Civil, Environmental and Geological Engineering conducted a study about the impact of climate change on the frequency and severity of floods in the Pasig-Marikina river basin. This study aimed to raise awareness on the flood hazards around the river-basin in Marikina after 25 years. Thus, helping the surrounding community to take action to combat the projected impacts of floods.

3.10 Flood Hazard Map from ArcGIS

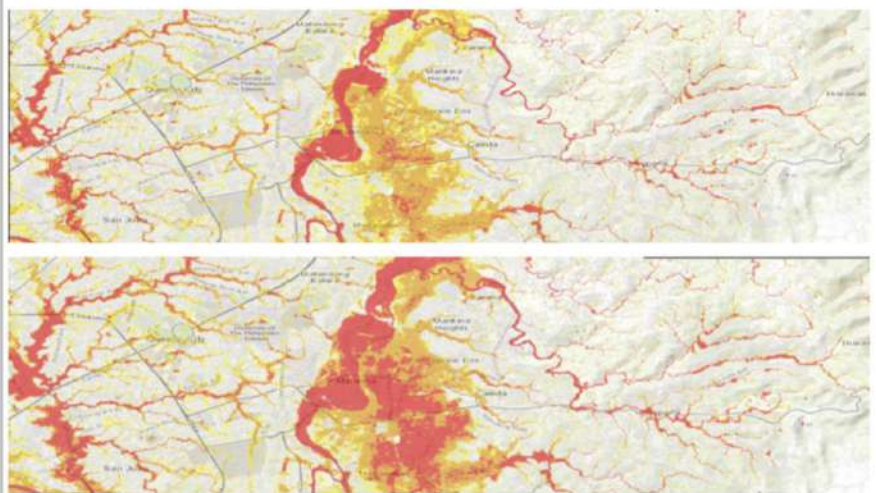


Fig. 12. Flood Hazard map of Marikina (upper 2018 and lower 2048)

Source: Monjardin, C.E.; Cabundocan, C.; Ignacio, C.; Tesnado, C. Impact of Climate Change on the Frequency and Severity of Floods in the Pasig-Marikina River Basin. E3S Web Conf. 2019, 117, 5, doi:10.1051/e3sconf/201911700005.

Machine Learning Predicting Model: Addressing Impacts of Climate Change

Source:

Cruz, F.R.G.; Binag, M.G.; Ga, M.R.G.; Uy, F.A.A. Multi-Layered Artificial Neural Network Flood Prediction System with Rain Gauge, Temperature Humidity Pressure Sensor, Ultrasonic Sensor, Soil Moisture Sensor and Anemometer. In Proceedings of the 2019 IEEE 11th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM); 2019; pp. 1–6.

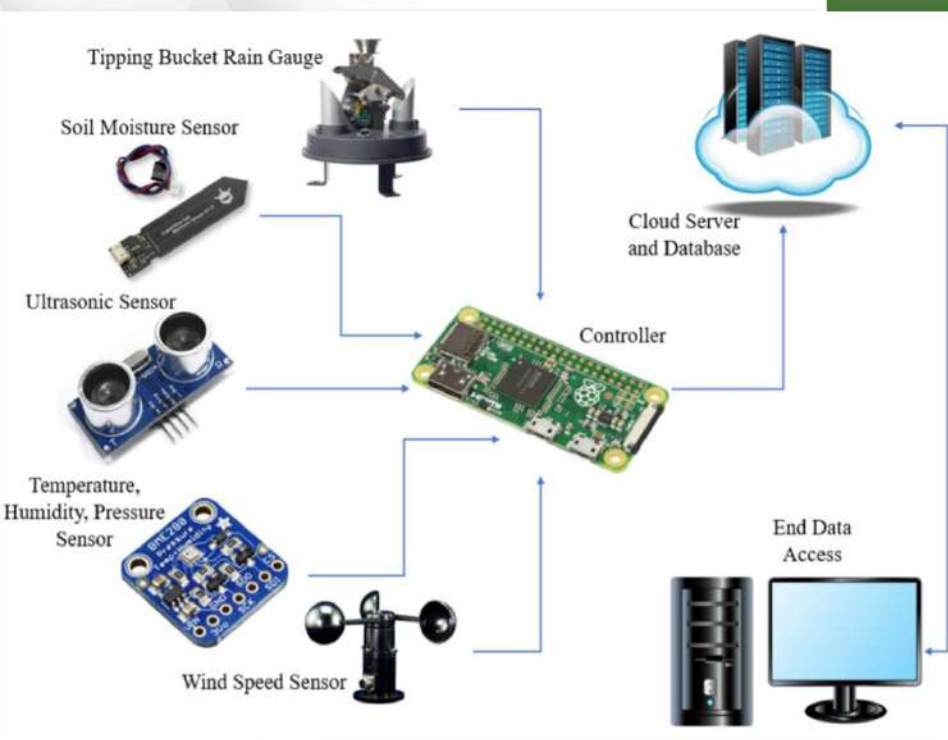
Multi-Layered Artificial Neural Network Flood Prediction System with Rain Gauge, Temperature Humidity Pressure Sensor, Ultrasonic Sensor, Soil Moisture Sensor and Anemometer

Febus Reidj G. Cruz^{1,2}, Matthew G. Binag², Marlou Ryan G. Ga², Francis Aldrine A. Uy³

¹ School of Graduate Studies, Mapua University, Manila, Philippines

² School of Electrical Electronics and Computer Engineering, Mapua University, Manila, Philippines

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The School of Electrical, Electronics, and Computer Engineering and the School of Civil, Environmental, and Geological Engineering did a joint-research and developed a system that could predict future flood level based on current data. The system integrates a multi-layer artificial neural network to contribute solution to reduce damage to properties, infrastructures, and loss of life (Cruz *et. al.*, 2018).

14 LIFE
BELOW WATER



Conserve and sustainably use the oceans, sea and marine resources for sustainable development



SHS Students from Mapúa University took part in cleaning the shore of Manila bay, a program by SM Corporation known as the International Coastal Cleanup 2018 for ocean conservation.



Increased Scientific Knowledge, Research, and Technology for Ocean Health

This is a joint research project of Mapúa University and National Cheng Kung University, in cooperation with Laguna Lake Development Authority, Pasig River Rehabilitation Center, and the Philippine Coast Guard. This study focuses on the onsite detection of harmful cyanobacteria in Laguna Lake brackish water.



International Conference on Sustainable Environmental Technologies (ICSET 2018)
Mapúa University, Intramuros, Manila, Philippines
19 – 21 August 2018

Quantitative Detection of Cyanobacteria (blue green algae) with Toxigenic and Odor Producing Genes in Laguna Lake, Philippines

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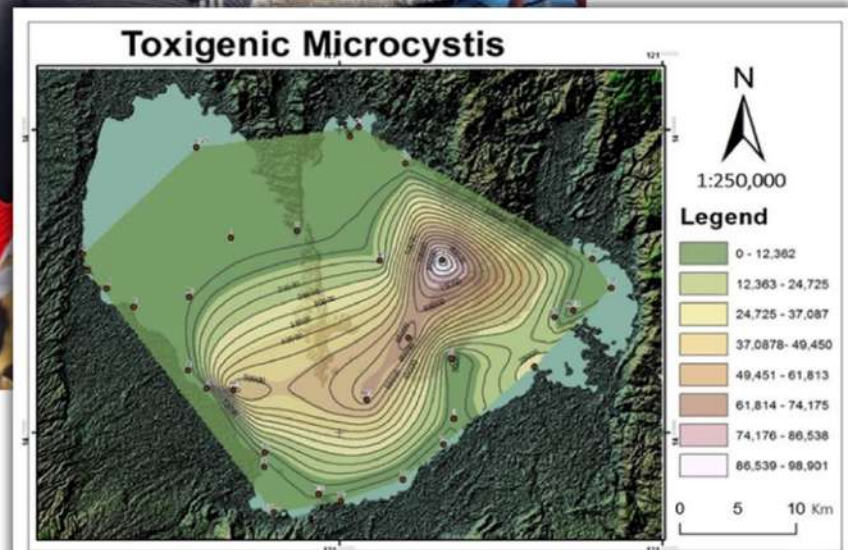
^d Department of Environmental Engineering, College of Engineering, National Cheng Kung University, Tainan City, Taiwan 701

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Source: de Leon R.F., et al., 2020
doi:10.6937/TWC.202003/PP_68(1).0006





Protect, restore and promote sustainable use of terrestrial ecosystems and reverse land degradation

A rapid site assessment in Marinduque Island San Antonio was done by D-HIVE research team funded by the Department of Science and Technology - Philippine Council for Health Research and Development. The information could aid in preparing prompt action and setting strategies that are helpful in carrying out risk reduction and reverse land degradation programs in the island.

ACEER 2019

IOP Publishing

IOP Conf. Series: Earth and Environmental Science 351 (2019) 012022 doi:10.1088/1755-1315/351/1/012022

Rapid site assessment in a small island of the Philippines contaminated with mine tailings using ground and areal technique: The environmental quality after twenty years

D B Senoro^{1,2,9}, K L M de Jesus^{2,6}, C A Yanuarua¹, P B Bonifacio², M T Manuel², B -N Wang^{3,4,8}, C -C Kao^{3,4}, T -N Wu^{3,5}, F P Ney^{1,2,7}, and P Natal^{1,2,7}

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⁸Department of Environmental Engineering, National Cheng Kung University, No. 1 University Road, Tainan City, Taiwan

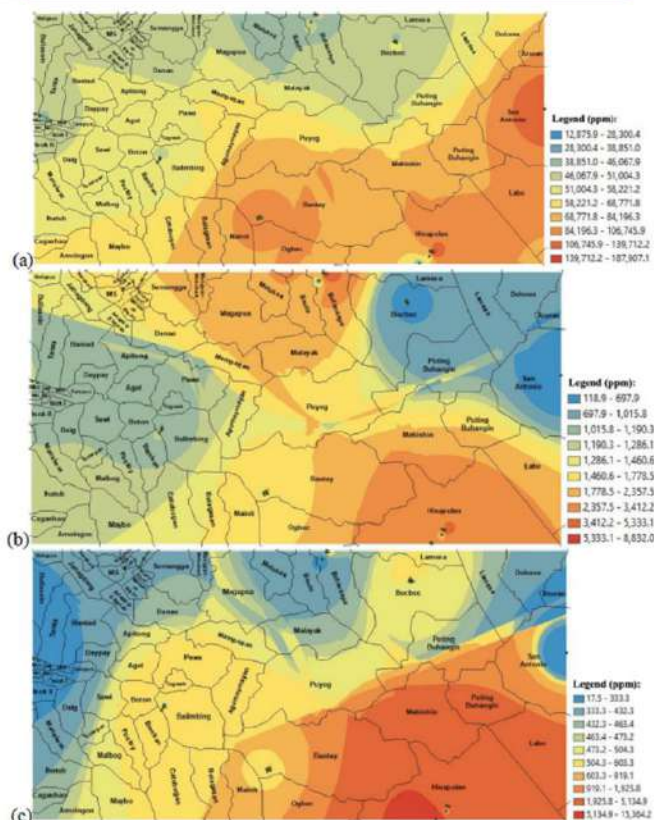


Figure 7. (a) Spatial distribution map of Fe concentration; (b) Spatial distribution map of Mn concentration; (c) Spatial distribution map of Cu concentration.



Figure 5. Aerial photograph captured by the UAV in Brgy. San Antonio.

Source: Senoro D.B., et al., 2019
doi:10.1088/1755-1315/351/1/012022

IFSR-MAPÚA Abaca Plantation and Cooperative Visit, 2019



International Field Study and Research (IFSR) program of Mapúa in Abaca Plantation in Marinduque. Abaca leaf fibers can be used for making sacks, fishing lines, and even clothings/slippers. This presented the practices of the community in the Abaca plantation on promoting the sustainable use of their terrestrial land plantation.

Source: IFSR-MAPÚA, 2019



Promote peaceful and inclusive societies for sustainable development

Street Crisis Management: Unarmed Combat 2018-19



In support of SDG16 – Peace, Justice and Strong Institution, Mapúa's Department of Physical Education and Athletics conducted an activity on self-defense entitled "Street Crisis Management: Unarmed Combat" last February 2018, wherein the university's security personnel and barangay marshals from Manila were trained in different self-defense techniques to help prevent and deal with widespread incidences of street crimes in the city.

Community Conference 2019: Crafting ordinances based on United Nations Sustainable Development Goals



In November 2019, the Office for Social Orientation and Community Development Programs of Mapúa University organized a conference and workshop for community leaders representing 43 barangays to craft community ordinances to help the community's way of life and to meet the United Nations Sustainable Development Goals.

Acknowledgement

The Sustainable Development Goals report synopsis 2018-2019 was prepared by Mapúa University, with inputs from international and national organizations, and offices, funds and programmes. Special thanks of gratitude to all International and national organizations, and offices, funds, programmes, and communities: And, to Mapúa University Offices, Schools and Departments:

International and national organizations, and offices, funds, programmes, and communities:

Building Entrepreneurial Ecosystems to Enhance Higher Education Value-Added for Better Graduate Employability (BEEHIVE) Project - Co-funded by the EU E+ Programme”
Taiwan-Philippines Joint Water Quality Research and Innovation Center (TPWRIC)

Department of Science and Technology-Philippine Council for Health Research and Development (DOST-PCHRD)

Commission on Higher Education (CHED)

Systems Technology Institute (STI) College

Simulating Cascading Rainfall-Triggered Landslide Hazards in The Philippines (SCaRP) Project – Co-funded by the British Council Newton Agham Programme and DOST-PCIEERD

Development of Health Index: Vulnerability to Extreme Environmental Events (D-HIVE) 4B Capital Project funded by DOST-PCHRD

Vulnerability Assessment and Prompt Emergency Response System (VAPERS)

Flame (Fire Luminosity and Multisensory Equipment)

Southeast and South Asia and Taiwan Universities

Osaka University, Japan

Rowan University, Glassboro, New Jersey, USA

Delhi Technology University, India

Verna University, Bulgaria

University of East Anglia, Norwich, England

National Tsing Hua University, Taiwan

National Cheng Kung University, Taiwan

Chia Nan University of Pharmacy and Science, Taiwan

National Kaohsiung University of Science and Technology, Taiwan

Marinduque Province

Marinduque State College

Pandacan, Manila

Acknowledgement

Mapúa University Offices, Schools and Departments:

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Center for Continuing Education and Special Competencies (CCESC)
Center for Guidance and Counseling (CGC)
Center for Teaching and Learning (CTL)
Corporate Communications Office (CCO)
Department of Arts and Letters
Department of Physical Education and Athletics
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Directive Research for Innovation and Value Enhancement Office (DRIVE)
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Human Resources Department (HRD)
Mapúa University, Makati
Mapúa Senior High School
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Office of the Executive Vice President for Academic Affairs (OEVPAAs)
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