2024

RESEARCH, DEVELOPMENT, AND EXTENSION

YEAR-END

In-House Review

USM RDE: INNOVATING SOLUTIONS FOR MODERN CHALLENGES

November 28-29, 2024
Commercial Building
University of Southern Mindanao
Kabacan, Cotabato

This serves as invitation

rpso@usm.edu.ph www.usm.edu.ph/rde

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No.: (064)572-2138
Email address: op@usm.edu.ph

OFFICE OF THE PRESIDENT

Message

As we close another fruitful year, it is fitting to reflect on the strides we have made in USM Research, Development, and Extension (RDE). Guided by our vision, mission, and RDE Framework, we remain steadfast in our commitment to creating meaningful change.

Why do we pour immense effort into research if it fails to benefit those who need it most? The answer lies in our purpose. As researchers and extensionists, we have been entrusted with the privilege—and the responsibility—to uplift the lives of our fellow Filipinos. Our work has the power to transform challenges into opportunities, and we must embrace this mission wholeheartedly.

In today's rapidly evolving world, modern challenges such as climate change, technological disruption, and socioeconomic inequality demand innovative solutions. Through collaborative efforts, our research can bridge gaps, address pressing issues, and contribute to sustainable progress. This underscores the importance of teamwork.

As we move forward, let us hold onto our collective purpose, knowing that the journey is as meaningful as the destination. May we continue to strive for excellence and make a difference in the lives of others.

May this year-end review rekindle our passion and renew our commitment to our mission.

Let us join hands to innovate solutions for modern challenges. May God bless us all.

FRANCISCO GIL N. GARCIA, PhD
SUC President IV

RDE YEAR-END IN-HOUSE REVIEW PROGRAM 2024

GENERAL SCHEDULE OF ACTIVITIES

November 28, 2024 (Thursday)

TIME	ACTIVITY
7:30 AM – 8:30 AM	Registration
8:30 AM – 9:15 AM	Opening Program
9:30 AM – 11:40 PM	Presentations
11:40 AM – 12:00 PM	Poster Viewing
12:00 NN – 1:00 PM	Lunch Break
1:00 PM – 5:00 PM	Presentations

November 29, 2024 (Friday)

TIME	ACTIVITY
7:30 AM – 8:00 AM	Registration
8:00 AM – 12:10 PM	Presentations
12:10 PM – 1:30 PM	Lunch Break
2:00 PM – 3:00 PM	Closing Program

Opening Program

Commercial Building
November 28, 2024
8:30 AM

National Anthem	**Rahima A. Cabunto**
Invocation	**Tamie C. Solpot, PhD** **Arnabie Murray**
Bagong Pilipinas Hymn	**Rahima A. Cabunto**
Welcome Remarks	**Debbie Marie B. Verzosa, PhD** Vice President for RD&E
Message of the President	**Francisco Gil N. Garcia, RPAE PhD** SUC President IV
Rationale	**Ma. Teodora N. Cabasan, PhD** Director, Research Publication Services Office Over-all Coordinator, In-House Review
Presentation of Evaluators	**Glyn G. Magbanua, PhD** Director, Extension Services Office

EMCEE: Charlotte Andrea Tutor

Closing Program

Commercial Building
November 29, 2024
2:00 PM

SYNTHESIS PRESENTATION	
SESSION 1	**MR. JOHN ALDRIN I. SANAMA** EPS I
SESSION 2	**MR. JAYSON S. BALTAZAR** EPS I
SESSION 3A	**MS. ZAIBEL ROSE TAMON** Research Assistant
SESSION 4B	**MS. KARIZZA JANE PEJANER** Faculty, PPALMA
PRESENTATION OF OUTPUT FOR USMARD CENTER RESEARCH	**JURHAMID C. IMLAN, PhD** Director, USMARD Center
PRESENTATION OF OUTPUT FOR EXTENSION	**GLYN G. MAGBANUA, PhD** Director, Extension Services
PRESENTATION OF OUTPUT FOR COLLEGE-BASED RESEARCH	**LYDIA C. PASCUAL, PhD** Director, Research and Development
PRESENTATION OF OUTPUT FOR PICRI RESEARCH	**DEBBIE MARIE B. VERZOSA, PhD** Vice President, RDE
PRESENTATION OF RDE OUTPUTS	**DEBBIE MARIE B. VERZOSA, PhD** Vice President, RDE
ACCEPTANCE OF RDE OUTPUTS	**FRANCISCO GIL N. GARCIA, RPAE, PhD** SUC President IV
CLOSING MESSAGE	**FRANCISCO GIL N. GARCIA, RPAE, PhD** SUC President IV
CLOSING PRAYER	**TAMIE C. SOLPOT, PhD** Faculty Researcher

***EMCEE*:** Janice M. Bangoy

EVALUATORS

Session I

Basic Research Category

Dr. Naomi G. Tangonan

Dr. Sailila E. Abdula

Dr. Romulo L. Cena

Session II

Applied Research & Development Category

Dr. Emma K. Sales

Dr. Josh Elisha R. Octura

Dr. Elizabeth D. Malacad

Session IIIA

Extension Category

Dr. Lorna G. Valdez

Mr. Roberto A. Cambel, Jr.

Dr. Samsia A. Ibrahim

Session IIIB

Social Research Category

Dr. Lorna G. Valdez

Mr. Jerome Bactol

Dr. Mervin G. Gascon

MODERATORS

Session I (Basic)

AM- Nov. 28 & 29, 2024
Kim Abellanosa (RDE)
Anamarie Uyangurin (CASS)

PM- Nov. 28 & 29, 2024
Marilyn P. Calub (CEIT)
Khris June Callano (CA)

Session II (Applied)

AM - Nov. 28 & 29, 2024
Hannah Lou Diez (RDE)
Roland Fajardo (CVM)

PM - Nov. 28 & 29, 2024
Josephine R. Flores (CVM)
Joeseph Quisado (CA)

Session IIIA (Extension)

AM - Nov. 28, 2024
Rahima A. Cabunto (RDE)

PM - Nov. 28, 2024
Saima M. Andil (IMEAS)

Session IIIB (Social)

AM - Nov. 29, 2024
Benjie Mari (RDE)

Day 1 - November 28, 2024

*The highligted projects in green color are the competing projects				
7:30 AM	8:30 AM	Registration		
8:30 AM	9:15 AM	Opening Program		
		BASIC RESEARCH (SESSION I)	APPLIED & DEVELOPMENT RESEARCH (SESSION II)	EXTENSION (SESSION IIIA)
9:30 AM	9:50 AM	101 - Developing Sustainable Agricultural Environment through the Organization of Durian Producers in Mindanao, Philippines Mel Chrisel Sales	201 - Biological diagnostic tool for vulnerable agroecosystems: nematode community analysis as an approach to assess sustainability of agricultural practices Ma. Teodora N. Cabasan & Bryan Lloyd Bretana	301 - BIO-NIHAN Para sa Kalikasan: Promoting Holistic Biodiversity Conservation Through Community Partnership Bryan Lloyd P. Bretana, Cromwel M. Jumao-as, Cherie Cano-Mangaoang, & Florence Roy P. Salvana
9:50 AM	10:10 AM	102 - Comprehensive Assessment of Watershed Dynamics: Evaluating Ecosystem Characteristics, Land Use/Land Cover Changes, Hydrologic Patterns, Soil Erosion Rates, and Conservation Priorities in the Libungan-Alamada Watershed, Philippines Jennet R. Mag-aso and Rezin G. Cabantug	202 - NICER Project 1 - Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Profitability Edward A. Barlaan	302 - BIO-NIHAN para sa kalikasan in Columbio: Sustainable initiatives for Biodiversity Conservation Cromwel M. Jumao-as, Cherie Cano-Mangaoang, Florence Roy P. Salvana, Bryan Lloyd P. Bretana & Elvie V. Diaz
10:10 AM	10:30 AM	103- Characterization of Inland Capture Fishery and Rapid Assessment of Fish Abundance and Diversity of Liguasan Marsh in Cotabato Province Leonila V. Papalid	203 - NICER Project 2 - Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement Gwen Iris D. Empleo and Ivy M. Pasquin	303 - Organic Corn Seed Production in Brgy. Saniag, Ampatuan, Maguindanao del Sur Mary Joy S. Canolas, Efren E Magulama, Nenita E. Olero, Janice M. Bangoy
10:30 AM	10:40 AM	BREAK		
10:40 AM	11:00 AM	104 - Water Quality Assessment and Characterization of Lake Buluan: A Comprehensive Analysis of Physicochemical Parameters, Heavy Metal Contamination and Biological Assessment Ronielyn F. Pinsoy, Jeconi Joice T. Paler & Carmee May L. Balneg	204 - NICER Project 3A - Development of Optimized PostHarvest Processing Approaches for Improved Quality of Cacao Beans Renel M. Alucilja	304 - Re-echo Training to Farmer's Cooperatives/Associations on Soil Sampling, Analysis, and Fertilizer Management in the Provinces of Maguindanao del Sur, Maguindanao del Norte, and SGA. Mary Joy Canolas
11:00 AM	11:20 AM	105 - Characterization of Inland Capture Fishery in Lake Buluan: Rapid Assessment of Fish Abundance and Diversity Stephen Dave M. Dupo, Carmee Lyn B. Paylangco, & Mark Julius C. Seloterio	205 - NICER Project 3B - Optimization and Standardization of Conventional Post-harvest Processes and Physicochemical Analysis for Improved Cacao Bean Quality Sheena B. Lucena	305 - Scholarship Presenting Advanced Research Knowledge (SPARK) Mary Joy S. Canolas & Allan C. Facurib

11:20 AM	11:40 AM	106 - Assessment and Modeling of Land Use/ Land Cover, Soil Quality, Flora and Fauna in the Tampakan-Lutayan Watershed as Tributary of Lake Buluan Dhealyn Decee V. Sabit & Jesabell O. Sambile	206 - Land Management Of Rubber- Based Systems In Southern Philippines: Effective Rubber-Based Cropping System in Southern Philippines Rezin G. Cabantug	306 - Going Bananas - Restoring Livelihood of Conflict Farmers in Cotabato Rezin G. Cabantug
11:40 AM	**12:00 PM**	**POSTER VIEWING**		
12:00 PM	**1:00 PM**	**LUNCH BREAK**		
1:00 PM	1:20 PM	107- SNAP Testing Assay for Screening Antibiotic Residues in Milk Elma G. Sepelagio and Cyrelle M. Besana	207 - Development of Cost and Effective Pest and DIsease Management of Rubber and Intercrops Elorde Jr. Crispolon	307 - Capability Building of Rubber Stakeholders and Role of Women and their Children Natural Rubber Industry in Agusan del Sur and North Cotabato Mary Rodelyn Cariaga
1:20 PM	1:40 PM	108 - Development and Evaluation of Corn (*Zea mays* L.) Microgreen-based Products Metche Anne C. Logronio, Lorelyn Joy N. Turnos-Milagrosa and Mark Al-Jamie J. Muttulani	208 - Developing Land Management Options for Diverse Cacao-Based System in Mindanao Mel Chrisel Sales	308 - Safe Spaces: Fighting Sexual Harassment through Education and Empowerment Mariz P. Balquin, Rolly C. Sotto & Vicente Delos Reyes
1:40 PM	2:00 PM	109- Technological Innovation and Value Addition Through Product Diversification of High-Value Crops for Halal Cosmetics and Supplements Queennie L. Rufino, Liezl Gray Oria, Marivic D. Candari, Jurhamid C. Imlan, Sandra Joy P. Pahm and Mary Ann B. Rama	209 - Commercialization of Chevon Food Products and Standardization of Processing Center Jalaloden B. Marohom	309 - Building Capacities of Barangay People for Community Development (BALABAG) Dhealyn Decee Sabit
2:00 PM	2:20 PM	110 - Fruit Quality Improvement in 'Carabao' Mango Through Identification of Genes for Scab and Stem-end Rot Resistance by Genotyping-by-Sequencing (GBS) and Genome Wide Association Studies (GWAS) Edward A. Barlaan & Joan P. Sadoral	210 - Zinc oxide nanoparticles for seed priming and nano foliar fertilizer Lydia C. Pascual	310 - Collaborative Networking and Engagement for Community Transformation (CONNECT) Janice M. Bangoy, Ritchel O. Torres & Diether M. Barro
2:20 PM	2:40 PM	111 - Phenotyping of Multi-cross Corn Hybrids and Synthetics with Tolerance to Herbicide Jessie Elarde, Efren Magulama, Nenita Olero and Edward A. Barlaan	211 - Production innovation for coffee and cacao beverages Lorelyn Joy N, Turnos-Milagrosa, Abubakar A. Murray, Sedra A. Murray & Mark Al-jamie Muttulani	311 - CASAMA - Comprehensive Assistance and Services Authentic and Meaningful Section-Phase 2: Utilization of Local Coconuts Fruits for VCO Enhance Soap Cherie Mangaoang & Marivic Candari
2:40 PM	3:00 PM	**BREAK**		

3:00 PM	3:20 PM	112 - FOOD FOR LIFE 3.0: Environmental and Hormonal Manipulations of Fishes in Ligawasan Marsh for Improved Breeding Florence Roy P. Salvaña, Cyrelle M. Besana and Pia Amabelle M. Flores	212 - HEIRIT: Establishment of USMART Technology Business Incubator - A DOST Funded TBI Jalaloden B. Marohom, Maricel G., Dayaday, Danilyn A. Flores, Nerissa G. Dela Viña, Romiel John P. Basan	312 - Establishment of Instrumentation System Modeling, Assembly and Response Testing (iSMART) Laboratory Maricel G. Dayaday
3:20 PM	3:40 PM	113 - Enhancing Adlai Farming Techniques through Precision Agriculture Shieryl P. Ortiza, Efren Magulama and Renel M. Alucilja	213 - Smart cacao Budwood Nursery and Greenhouse for Production of High-Quality Planting Materials Edward A. Barlaan, Maricel G. Dayaday & Renel M. Alucilja	313 - CBDEM - Delicacies: Capacity Building, Demonstration and Enterprise Development of Maguindanaon Delicacies Roy B. Gacus, Francisco Gil N. Garcia, Esmaira G. Gunsayan, April Geraldine M. Quinonero, Analyn A. Gonzales & Irving T. Fajarito, Jr.
3:40 PM	4:00 PM	114 - Harnessing Rhizobacteria and Actinomycete's Potential as Biofertilizer and Biocontrol Inputs Supportive of Strengthening the Organic Agriculture Industry (HaRBIS-Organic) Mel Chrisel A. Sales, Ma. Teodora N. Cabasan, and Neil Pep Dave N. Sumaya	214 - Towards Commercialization: HalalPlant Based Concoctions as Nutrient Sources for Crucifers and Solanaceous Vegetable Crops Through Field Validation and Market Analysis Jhon Dave E. Llanto, Mark Al-Jamie J. Muttulani and Lorelyn Joy N. Turnos-Milagrosa	314 - CORN PLUS: Promotion of USM OPV Corn through the Adoption of Organic Production Nenita E. Olero & Janice M. Bangoy
4:00 PM	4:20 PM	115 - Water Quality Assessment and Characterization of Liguasan Marsh in Cotabato Province: A Comprehensive Analysis of Physico-Chemical Parameters, Heavy Metal Contamination, and Biological Assessment Lydia C. Pascual & Debbie Marie B. Verzosa	215 - Market Analysis and Innovation of Cacao Based Products for Commercialization Analyn A. Gonzales,Harem R. Roca, Jane R. Desamito, Sandra Joy Pahm and Esmaira G. Gunsayan	315 - USM T.O.U.R.S. (Travel Odyssey: Unveiling Rich Sights) Meldred F. Samblaceno, Dianne Cristel M. Basilio & Rosyell Angelo N. Piosca
4:20 PM	4:40 PM	116 - Characterization and Performance of Ten (10) Promising Varieties of Cacao in Different Agro-Climatic Zones in the Philippines: Project 1. Yield and Bean Quality Evaluation of Ten (1) Promising Cacao Varieties in Type II and Type III Agroclimatic Zones in Northern and Southern Mindanao Ardniel A. Baladjay & Sheena B. Lucena	216 - Project Title: Response Surface Optimization of Cereal-based Patty and Kroepek for Enhanced Acceptability and Market Assessment Maribelle T. Piamonte, Ivy Mar B. Cabornida and Analyn A. Gonzales	316 - Towards a healthy well-being: Psychoeducation and Psychosocial Intervention for High scoring high school students in DASS21 in Kabacan, Cotabato Myka Ivana O. Sorilla
4:40 PM	5:00 PM	117 - Hybridization of Rubber (*Hevea brasiliensis*) Towards Development of High-Yielding and Disease-Resistant Clones Janice Bangoy, Sheena Lucena, Marry Grace Balbuena & Jasmin Pecho		317 - Infograp ng mga Impormasyon Hinggil sa Halaga, Tamang Pamamaraan at Benepisyo ng Pagpapasuso: Isang Teknikal Na Pagsasalin sa Wikang Teduray Radji Macatabon

DAY 2- NOVEMBER 29, 2024				SOCIAL (SESSION IIIB)
8:00 AM	8:20 AM	119 - Molecular validation of USM-Developed corn varieties (USM 5,6,10) Marry Grace S. Balbuena	219 - SMART SNACKS: Creating Innovative & Affordable Snacks with Healthy Options Janice M. Bangoy, Maybell S. Martin, Leila S. Moscoso	319 - Assessment of Socioeconomic Status of Communities in the Liguasan Marsh in Cotabato Province Francisco Gil N. Garcia and Romiel John P. Basan
8:20 AM	8:40 AM	120 - Molecular Identification and Control of Brown Leaf Malady of Selected Fruit Crops Clark I. Maarat, Jasmin A. Pecho, Marry Grace Balbauena & Tamic C. Solpot		320 - Mapping the Future Plate: Evaluating the Spatiotemporal Dynamics of Meso-Level Food Security (MFS) of Cotabato Province in Changing Climate Romiel John P. Basan
8:40 AM	9:00 AM	121 - Breeding of White OPVs, Glutinous, and Sweet Corn for Herbicide Nenita Olero, Jessie Elarde, Efren Magulama and Monaira Sumael	221 - Optimization of The Production of Biochar from Coconut and Animal Waste Jurhamid C. Imlan and Rezin G. Cabantug	321 - Inclusive Social Services in Local Government Units and Public Higher Education Institutions (HEIs) in Cotabato Province Jhon Dave Llanto
9:00 AM	9:20 AM	122 - Breeding of Corn Varieties with Climate Change Resilience: Drought Resistance Nenita E. Olero	222 - USM Center for Flood/ Landslide Preparedness and Mitigation (IDD) Cristopher Benito	322 - Assessment of Socio-economic Status of Communities in Lake Buluan April Geraldine M. Quiñonero, Ma. Karysa F. Garcia, Jessa May M. Versola
9:20 AM	9:40 AM	123 - Pre-Harvest Treatment on the Productivity of Yellow Passion Fruit Under Kabacan Cotabato Condition Sandra Joy P. Pahm	223 - Productivity Assessment of Robusta Coffee Applied with Organic and Inorganic Fertilizers in Mindanao Leandreux Ocasion	323 - Unveiling Patterns: Data Analytics Approach to Understanding Student Success in USM College Entrance Exams Janice T. Palmaera, Elizabeth R. Genotiva & Arjay S. Agbunag
9:40 AM	9:50 AM	Break		
9:50 AM	10:10 AM	124 - Characterization of Palm Oil Products Using GC-MS and FTIR and its Potential Application for Bio-Plasticizers Marivic Candari, Nikki Jane Benito and Queennie L. Rufino	224 - Indigenous Phosphorus and Potassium Solubilizing Microorganisms as Potential Enhancer of Phosphorus and Potassium Nutrient Uptake of Corn Maria Elena N. Tanabe & Leandreux Ocasion	324 - Examining Input, Output and Outcome Indicators of Higher Education Towards Data-Driven Quality Improvement Francisco Gil N. Garcia, Lawrence Anthony U. Dollente, Willie Jones B. Saliling, Romiel John P. Basan & Kharlo J. Subrio

10:10 AM	10:30 AM	125 - Breeding of Elite Durian Cultivar for Improved Fruit Characteristics and Asexual Propagation of Musang King Cultivar Jurhamid C. Imlan and Sheena Lucena	225 - Project 1. Regional Intellectual Property and Technology Business Management (IPTBM) in SOCCSKSARGEN through the RAISE Program. Pia Amabelle Flores, Cyrelle Besana and Julius Jerome Ele	325 - Dokumentasyong Manobo Kalamansig Radji A. Macatabon
10:30 AM	10:50 AM	126 - Optimization and Validation of USM Developed Biostimulant for Dragon Fruit Production Jasmin A. Pecho	226 - Enhancement of the Agri-Aqua Technology Business Incubator (ATBI) in University of Southern Mindanao (USM) Through The Raise Program Pia Amabelle Flores	326 - Assessment of the Integration of Gender and Development (GAD) Concepts Across General Education Courses in Selected SUCs in Region XII April Rose Butalid
10:50 AM	11:10 AM	127 - Assessment of Durian Clone Variability: A Study on Yield Performance in USM Established Orchard Janice M. Bangoy	227 - Establishment of Regional Agri-Business Hub (ABH) in SOCCSKSARGEN through the Raise Program Ronald Z. Pascual	327 - Project Title: PCC's Dairy Box and Family Module: Success Stories, Challenges and Ways Forward Glyn B. Gabano-Magbanua, Estella B. Barbosa, Marlyn A. Resurreccion & Anamarie B. Uyangurin
11:10 AM	11:30 AM	128 - Screening for Resistance and Fungicide for Pestalotiopsis Leaf Spot disease of Coffee Bernadith Borja & Tamie C. Solpot	228 - Project 4: Establishment of Regional Knowledge Management (KM) Hub in SOCCSKSARGEN through the RAISE Program. Josephine Migalbin	328 - Satellite SERDAC: Establishment of Satellite SocioEconomic and Data Analytics Center (SERDAC) at the University of Southern Mindanao to Strengthen Capacity in Socio-Economic Research and Analytics in the Region Romiel John P. Basan
11:30 AM	11:50 AM	**POSTER VIEWING**	229 - Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation for Rubber Cropping System Leandreux Ocasion	329 - USM futures thinking program: Food and health security, systems, innovation, and sustainability Francisco Gil N. Garcia, Edward A. Barlaan & Ma. Teodora N. Cabasan
11:50 AM	12:10 PM		**POSTER VIEWING**	330 - Empowering Equity Target Students: Enhancing Access and Success across SUCs in Region XII Francisco Gil N. Garcia, Marcos F. Monderin, Romiel John P. Basan, Ronielyn F. Pinsoy, Lawrence Anthony Dollente, Estella Barbosa, Vilma Santos, Metche Anne Logronio, Stephen Tinambunan, John Carlo Villarin & Stella Lasquite
12:10 PM	12:30 PM			**POSTER VIEWING**
12:30 PM	1:30 PM	**LUNCH BREAK**		

2:00 PM	3:00 PM	**CLOSING PROGRAM**

VISION

USM envisions upholding its status of excellence in Research and Development by continuing to be the pioneer source of technology and information that are on track towards poverty reduction, food security, and global competitiveness for cohesive and sustainable development among its multi-socio-cultural clienteles.

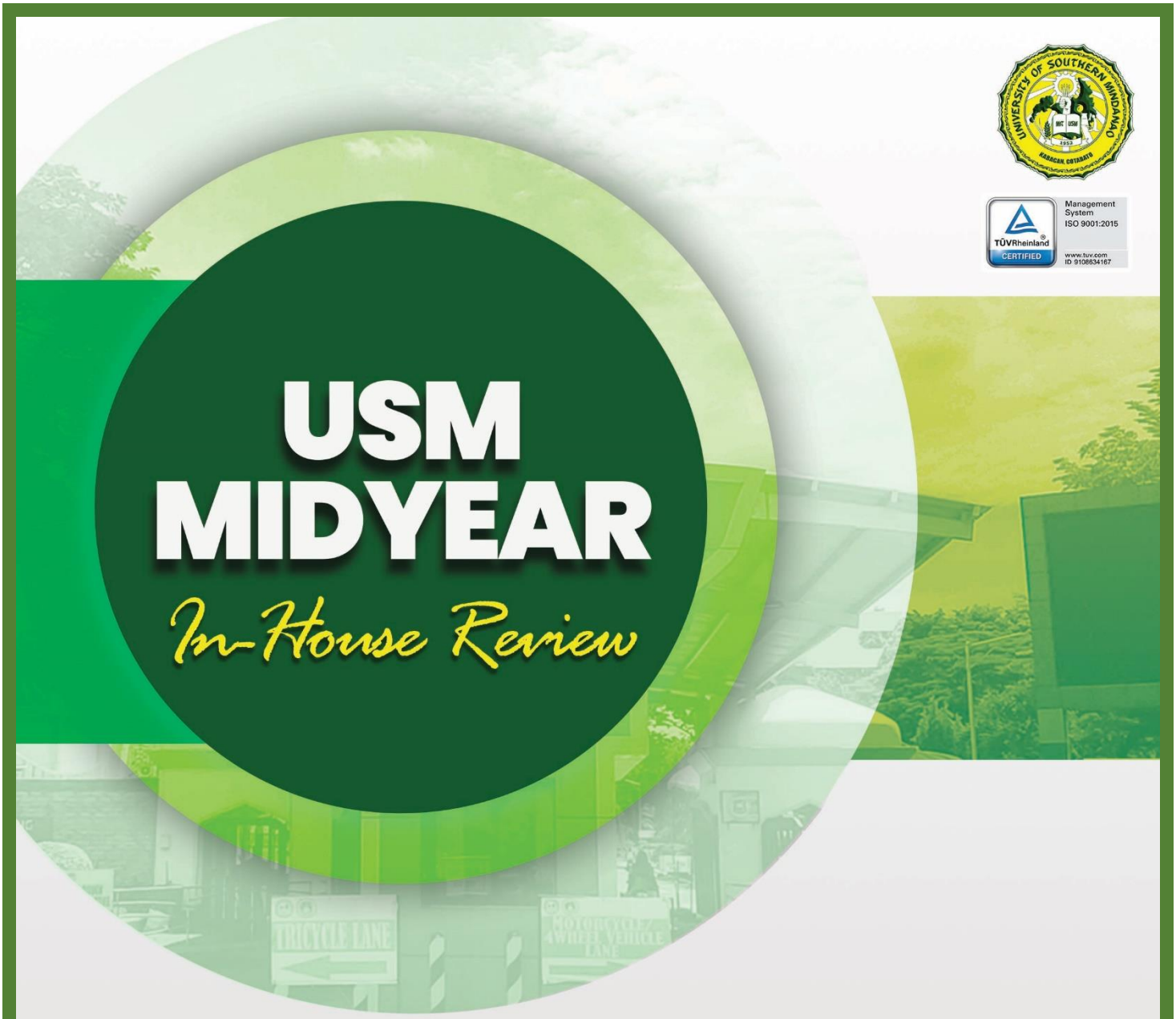
MISSION

To put into operation a system to undertake multi-disciplinary approach for R & D activities to ensure that technologies and information generated can address the prevailing concerns and issues in the local, regional and national levels for sustainable development.

GOALS

- Improve the system with scientific excellence through collaborative and interdisciplinary R&D activities that are anchored on the University's vision/mission;
- Conduct researches and generate technologies that could provide solutions and address the local, regional, and national concerns and issues;
- Provide a mechanism to ensure that research results be effectively and efficiently delivered to the clients for utilization and commercialization; and
- Build up resource generation facilities for continuous and sustainable R&D programs that geared towards ensuring food security, global competitiveness, socio-cultural responsiveness that eventually improve the quality of life of the clienteles.

RDE YEAR-END IN-HOUSE REVIEW
November 28-29, 2024



USM MIDYEAR

In-House Review

Theme:
Excellence in USM RDE towards societal impact

2023

July 20, 2023

This serves as an invitation

rpso@usm.edu.ph www.usm.edu.ph/rde

MIDYEAR IN-HOUSE REVIEW PROGRAM 2023

GENERAL SCHEDULE OF ACTIVITIES

July 20, 2023 (Thursday)

TI ME	ACTIVITY
7:30 AM – 8:30 AM	Registration
8:30 AM – 9:15 AM	Opening Program
9:30 AM – 12:00 PM	Presentations
12:00 PM – 1:00 PM	Lunch Break
1:00 PM – 4:10 PM	Presentations
4:10 PM – 4:20 PM	Break
4: 20 PM – 4:40 PM	Closing Program

Opening Program

Commercial Building
July 20, 2023
8:30 AM

Invocation	**Dr. Tamie C. Solpot** **Dr. Abubakar A. Murray**
National Anthem	**In-Video**
Cotabato Hymn	**In-Video**
Kabacan Hymn	**In-Video**
Welcome Remarks	**Dr. Ma. Teodora N. Cabasan** Vice President for RD&E
Message of the President	**Dr. Francisco Gil N. Garcia** SUC President IV
Rationale	**Prof. Lydia C. Pascual** Director, RDO
Presentation of Evaluators	**Dr. Mary Joy Cañolas** Director, Extension Services Office Over-all Coordinator, Midyear In-house Review

EMCEE : Maria Angelika T. Balungay

EVALUATORS

Session I

Basic Research

Engr. Willie Jones B. Saliling

Dr. Naomi G. Tangonan

Dr. Krizler C. Tanalgo

Session II

Applied Research

Dr. Edward A. Barlaan

Assoc. Prof. Bryan Lloyd P. Bretaña

Dr. Khris June L. Callano

Session III

Extension

Dr. Josephine L. Arbes

Dr. Ardniel A. Baladjay

Dr. Josephine R. Migalbin

Session IV

Social Research, Extension, Product Development

Dr. Astrofil Hyde M. Alcala

Dr. Romiel John P. Basan

Dr. Elizabeth C. Molina

Dr. Apple R. Ureta

MODERATORS

Session I

Basic Research

AM - Leanne Jay M. Tejero (CSM)
AM -Nor-ain M. Corpuz (CEIT)

PM -Marlene E. Ofrecio (ISPEAR)
PM -Norquez M. Mangindra (CED)

Session II

Applied Research

AM - Rene C. Cabahug, Jr. (CTI)
AM -Gary D. Lasaga (CVM)

PM - Florey Mae Pascua (CEIT)
PM -Samson L. Rapuza (CTI)

Session III

Extension

AM -Estella B. Barbosa (CASS)
AM -Rowell N. Nitafan (CASS)

PM -Saima M. Andil (IMEAS)
PM -Alina S. Arancel (CHS)

Session IV

Social Research and Extension & Product Development

AM -AP Warren P. Adamat (CVM)
AM -Saque J. Amilbahar (CEIT)

PM -Ellen Joy M. Farala (CED)
PM -Karizza Jane B. Pejaner (P-PALMA)

		BASIC	APPLIED	EXTENSION	SOCIAL RESEARCH AND EXTENSION + PRODUCT DEVELOPMENT
7:30 AM	**8:30 AM**	**Registration**			
8:30 AM	**9:15 AM**	**Opening Program**			
9:30 AM	9:40 AM	101 - (Futures Thinking) Innovative Growing of Corn Microgreens (Zea mays) as Potential New Food for Commercialization -Mark Al-Jamie J. Muttulani, Lorelyn Joy N. Turnos, & Leila S. Moscoso	201 - Program: Land management of rubber-based systems in Southern Philippines PROJECT 1. Effective Rubber-Based Cropping System in Southern Philippines - Rezin Cabantug	301 - Infograp NG Mga Impormasyon Hinggil SA Omicron Variant Para Maiwasan Ang Pagkalat NG COVID-19 at Ang Benipisyo NG Pagbabakuna: Isang Teknikal NA Pagsasalin -Radji A. Macatabon	401 - Examining Academic and Institutional Factors Influencing Licensure Performance of Selected Programs in the University of Southern Mindanao-Kharlo Subrio
9:40 AM	9:50 AM	102 - Propagation techniques in growing various herbs and spices and their bio-control efficacy against Ralstonia sp. And Phytophtora sp. -Lorelyn Joy Turnos-Milgarosa, Mark Al-Jamie J. Muttulani, & Tamie C. Solpot	202 - Program: Land management of rubber-based systems in Southern Philippines PROJECT 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation for Rubber Cropping System - Leandreux Ocasion	302 - Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM through Instructional Materials Development and Validation - Philip Lester P. Benjamin & Sandra A. Nanding	402 - Financial Analysis of Income Generating Projects (IGP) of Public High Education Institutions (HEIS) in Region XII - Charisse Quiambao
9:50 AM	10:00 AM	103 [Futures Thinking] - Sustainable production of culinary ingredients using halal plant-based extracts as root promoter, nutrient booster and bio-fumigants - Mark Al-Jamie Muttulani, Lorelyn Joy Turnos-Milagrosa, Bernadith T. Borja, Sandra Joy P. Pahm	203 - Program: Land management of rubber-based systems in Southern Philippines PROJECT 4. Development of Cost and Effective Pest and Disease Management of Rubber and Intercrops - Joan P. Sadoral	303 - Adopt a Madrasah for Knowledge and Skills Development in Teaching Pedagogy of Azatidz in Barangay Aringay, Kabacan, Cotabato - Sofia G. Molao, Remedios C. Kulidtod, Norjaida D. Maliga, JIkiri M. Entol, & Abdulnasser G. Makalugi	403 - Compendium of Ethnoveterinary Therapies for Control of Internal Parasites in Livestock - Elizabeth C. Molina and Josephine Flores
10:00 AM	**10:20 AM**	**Open Forum**			
10:20 AM	10:30 AM	104 - Impact of Fertigation and Pre-Harvest Application of Biocon Agent on Dragon Fruit Production -Jasmin A. Pecho	204 - Utilization of Corn Sprouts as Fodder for Livestock Production - Mary Ann D. Rama, Efren Magulama, & Josephine R. Migalbin	304 - CASAMA-Comprehensive Assistance and Services Authentic and Meaningful Action-Phase 2: Utilization of Local Coconuts Fruits for VCO Production and VCO Enhance Soap - Cherie C. Mangaoang & Marivic D. Candari	404 - MOM (Mothers on Move) Towards Building Assets Through Innovation Development of Fish Products -Ivy Mar Cabornida

10:30 AM	10:40 AM	105 - Efficiency of Freshwater Fish Farming under Monoculture Oil Palm Plantation -Pia Amabelle M. Flores & Rezin Cabantug	205 - Lactic Acid Bacteria Serum Production for Silage Making -Josephine R. Migalbin, Bernadith Borja, & Neil Pep Dave Sumaya	305 - Integrated Services for Enhanced Education (I-SEE): Connectivity Resilience Project Amidst COVID-19 Pandemic - Janice M. Bangoy	405 - Gender in USM Extension Projects: Engagement , Oppoturnities and Entry Points -Marcos F. Monderin
10:40 AM	10:50 AM	106 - Yield Performance of 12 Promising Rubber Clones Using Different Tapping System -Sheena B. Lucena and Randy Tumacder	206 - Development of Herbal Mosquito Repellent from Leaves and Flowers of Marigold (Tagetes erecta) -Sedra A. Murray & Elma G. Sepelagio	306 - Development of Community-Based Tourism in Kabacan, Cotabato - Meldred F. Semblacena	406 - I-CARES: Islamic Relief's COVID19 Adaptation and Recovery through Economic and Social Protection and Support project - Esmaira Gunsayan
10:50 AM	**11:10 AM**	**Open Forum**			
11:10 AM	11:20 AM	107 - Multilocation Trial of Ten (10) Promising Varieties of Cacao in Type II and Agro-CLimatic Zone in Southern and Northern Mindanao - Ardniel A. Baladjay	207 - Accelerated R&D Program for Capacity Building of Research and Development Institutions and Industrial Competitivenes: NICHE centers in the regions for R&D (NICER) Program: Cacao R&D Center NICER Project 1 - Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Profitability -Edward A. Barlaan	307 - Bionihan Para sa Kalikasan: Community Empowerment Towards Conservation - Florence Roy P. Salvaña, Cromwel M. Jumao-as, & Cherie C. Mangaoang	407 - Pagpalain Bangsamoro: Unveiling the history and Struggles of primary actors towards peaceful Bangsamoro government - Saima Andil
11:20 AM	11:30 AM	108 - Phenology, Yield and Fruit Quality of Different Pummelo Cultivars at USMARDC -Nancy E. Duque	208 - NICER Project 2 - Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement - Gwen Iris D. Empleo	308 - CA-CARE: Capacity and Resiliency Enhancement for Agricultural Technologist of Cotabato Province - Noe S.Mamon, Jr. & Gelyn V. Amilbahar	408 - Development of Contextualized Instructional Materials in Teduray -Girlie D. Batapa, Ashley Coleen Ortiz, & Hazel Ann S. Soriano

11:30 AM	11:40 AM	109 - Francisco Gil N. Garcia University of Southern Mindanao Higher Education Research: Technological Advancements and Innovation Projects	209 - NICER Project 3 - Development of Optimized Post-Harvest Processing Approaches for Improved Quality of Cacao Beans -Renel M. Alucilja	309 - Farmers Field School (FFS): Technology Delivery System for Enhancing Skills on Swine Production and Artificial Insemination - AP Warren P. Adamat & Vrenelie II D. Flores	409 - Commercialization of Chevon Food Products and Standardization of Processing Center - Jalaloden Marohom
11:40 AM	**12:00 PM**	**Open Forum**			
12:00 PM	**1:00 PM**	**Lunch Break**			
1:00 PM	1:10 PM	110 - Efficiency of various physical exercise, dietary intakes - Moreno Java Jr.	210 - SMART Cacao Budwood Nursery and Greenhouse for Production of High-Quality Planting Materials - Edward A. Barlaan	310 - Gender Research and Capability Building in Extension Projects: Exploring Engagement, Opportunities and Entry Points -Glyn G. Magbanua	410 **[Extension]** - Transferring and Advancing Learning materials for Knowledge: Using of IECs for Archiving and Information Disseminating (TALK:AID) - Charlotte Adrea D. Tutor, Allan C. Facurib, & Janice M. Bangoy
1:10 PM	1:20 PM		211 - Development of Corn Hybrids and Synthetic with Tolerance to Herbicide - Jessie Elarde	311 - Livelihood Enhancement through Agricultural Products - Leo M. Gayao, Jane R. Desamito, Karizza Jane B. Pejaner, & Sambay P. Mla	411 **[Extension]** - Use of ICT in Facilitating Independent Learning and Teaching in the New Normal - Benedict D. Entera & Astrofil Hyde M. Alcala
1:20 PM	1:30 PM	112 - Carbon Stock Potential of Agroforests in Univeristy of Southern Mindanao (USM) and Arakan Valley Agricultural School (AVAS) -Florence Roy Salvaña	212 - (Futures Thinking) Cacao-Based Product Development and Innovation Using Cocoa Butter and Powder -Harem R Roca & Jane R. Desamito	312 - Knowledge and Skills Advancement for the Ambulant Food Vendors in Kabacan, Cotabato - Melchie G. Palapar, Maribelle T. Piamonte, & Shirl May M. Bebit	412 - Development of E-learning Modules for Certificate Courses in Halal Science -Jalaloden Marohom, Francisco Gil N. Garcia, Jurhamid C. Imlan and Josephine R. Migalbin
1:30 PM	**1:50 PM**	**Open Forum**			

1:50 PM	2:00 PM	113 - Sustainable Forage Production Systems for Ruminant Livestock at USMARDC - Mary Joy S. Cañolas, Ivy M. Pasquin, Lorelyn Joy T. Milagrosa, & Geoffray R. Atok	213 - Developing Land Management Options for Diverse Cacao-Based System in Mindanao -Mel Chrisel Sales	313 - Juan Food: Enabling 4Ps Beneficiaries Through Community Garden in Support for Household Food Security and Livelihood as Response to COVID-19 Pandemic -Mary Rodelyn A. Cariaga	413 - Statistical Tool Selector(Stat Select): A Mobile App for Faculty, Students and Researchers -Anna Jean S. Garcia, Honey Vincent Valle, Daryl Mae Mamon, Leonard Paleta, Jupiter Pilongco, Roel Valenton, Jeaneth Licaros, Jonald Pimentel, Philip Benjamin, Rowel Madio, Leorence Tandog, & Debbie Marie Verzosa
2:00 PM	2:10 PM	114 - (Futures Thinking) Herbicide-Based Application as Weed Management Intervention for Improved Productivity in Adlay - -Baser L. Mamalac	214 - Steady-State Hydraulic Numerical for Optimized Water Distribution Water Distribution Network Modelling: An Application of Selected Hydraulic Solver -Ma. Dely P. Esberto	314 - CAPE 2- Consultancy for Agricultural Productivity Enhancement Program - Francisco Gil N. Garcia, Edward A. Barlaan, & USM Experts	414 - Development of Arduino Microcontroller-based Lee's Disc Apparatus -Benedict Entera & Amancio II S. Manceras
2:10 PM	2:20 PM	115 -	215 - Optimization of Irrigation Flow Through Conduit Microhydropower to Generate Electricity for Off-grid Barangay of Kabacan, Cotabato -Marilyn S. Painagan, Tito Jun T. Tidula, Benhamin I. Mamalo, and Jonnah Mae A. Casalan	315 - PROJECT 6. Capability Building of Rubber Stakeholders and Role of Women and their Children Natural Rubber Industry in Agusan del Sur and North Cotabato -Mary Rodelyn A. Cariaga	415 - Design & Innovation of Fully Automatic Egg Incubator -Joel V. Misanes & Orlando Forro
2:20 PM	**2:40 PM**	**Open Forum**			
2:40 PM	2:50 PM	116 - BARMM in a Changing Environment (Biomonitoring and Assessment of the Relationship between Marsh and Man) - Meriam Manampan-Rubio, Renee Jane A. Ele, Bona Abigail H. Husain, and Krizler C. Tanalgo	216 - (Futures Thinking) Formulation and Optimization of Functional Cereal-Based Snack Foods -Maribelle T. Piamonte, Apple U. Revilla, Oscar Q. Magbanua, Ian Jade A. Flores, Ivy Mar B. Cabornida, Ma. Teodora N. Cabasan	316 - “Laro Mo, Sagot Ko” A Sports Management Skills Development Project - Cheeze R. Juanito	416- **[Extension]** Community-Based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Kagikit for Certification-Analyn A. Gonzales

2:50 PM	3:00 PM	117 - Spatial and Temporal Crop Diversification in Adlay-Based Cropping System for Land-Use Efficiency and Improved Crop Productivity and Sustainability -Nancy E. Duque, Baser L. Mamalac, Ana Rose Cunanan, & Efren E. Magulama	217 - University of Southern Mindanao-Treelife Coco Sugar Research and Development - Maria Elena M. Neyra-Tanabe	317 - Hakbang para sa Pagbabagong Lubos (HAPLOS) para PWUDS: A Community-Based Fitness and Livelihood Project - Moreno B Java, Jr., Marlene E. Orfrecio	417 - **[Extension]** Production, Processing and Positioning (3Ps) coco-based Products for Collaborative Barangay-Based Development and Economic Mainstreaming (3Ps CBDEM) - Jay-R G. Vildac, Lian D. Bagonoc, Jeannie U. Duka, Aileen Mitzi M. Alba, & Rodelyn A. Cariaga
3:00 PM	3:10 PM	118 - Establishment , Conservation and Utilization of Indigenous Tropical Fruit Crops at the University of Southern Mindanao -Nenita E. Olero	218 - (Futures Thinking) Development and Halal Verification of "Plant-Based Protein-Rich" Feed for Halal Grown Poultry Products -Jurhamid C. Imlan, Queennie L. Rufino, & Mary Ann B. Rama	318 - Kabataan Kontra Droga at Terrorismo (Kkdat): Sports Development Program-Moreno B. Java Jr.	418 - New Formulation of BAR and Liquid Soap From Selected Industrial Crops with Potential Anti-MIcrobial Activity -Abubakar A. Murray, Sedra Murray & Lorelyn Joy Turnos-Milagrosa
3:10 PM	**3:30 PM**	**Open Forum**			
3:30 PM	3:40 PM	119 - Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber -Tamie C. Solpot, Ma. Teodora N. Cabasan & Bernadith T. Borja	219 - Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genom-wide Association Studies (GWAS) - Edward Barlaan	319 - YES, through SSTAMP: Youth Engagement in Sports through Sustainable Sport Training and Management Program - Elpedio A. Arias, Moreno B. Java Jr., Vinus P. Java & Eduard S. Sumera	419 - Maguindanaon Delicacies: Packaging, Labeling, Marketing and Profitability Toward Commercialization - Roy Gacus
3:40 PM	3:50 PM	120 - Francisco Gil N. Garcia - University of Southern Mindanao Futures Thinking: Food and Health Security, Systems, Innovations and Sustainability	220 - Digital screening promotion of technologies (Pia Amabelle Flores)	320 - HOPE (Holistic Opportunities for Progress and Empowerment) for Student Mothers - Jacinta T. Pueyo, Altair R. Neri, & Vivekeh D. Bat-og	420 - Product Development and Innovation of Calamansi Infused Bevegraes for Refrehsing Blends USMARC - Sandra Joy Pahm
3:50 PM	**4:10 PM**	**Open Forum**			
4:10 PM	**4:20 PM**	**Break**			

4:20 PM	**4:40 PM**	**Closing Program**

9:30-9:40

101 – (Futures Thinking) Innovative Growing of Corn Microgreens (Zea mays) as Potential New Food for Commercialization

Mark Al-Jamie J. Muttulani & Lorelyn Joy Turnos

ABSTRACT. X

Keywords: X

9:40-9:50

102 – Propagation techniques in growing various herbs and spices and their bio-control efficacy against Ralstonia sp. And Phytopthora sp.

Lorelyn Joy Turnos-Milagrosa, Mark Al-Jamie J. Muttulani, & Tamie C. Solpot

ABSTRACT. X

Keywords: X

9:50-10:00

103 – (Futures Thingking) sustainable production of culinary ingredients using halal plant-based extracts as root promoter, nutrient booster and bio-fumigants

Mark Al-jamie Muttulani, Lorelyn Joy T. Milagrosa, Bernadith T. Borja, & Sandra Joy P. Pahm

ABSTRACT. X

Keywords: X

10:20-10:30

104 – Impact of fertigation and pre-harvest application of biocon agent on dragon fruit production

Jasmin A. Pecho

ABSTRACT. X

Keywords: X

10:30-10:40

105 – Efficiency of freshwater fish farming under monoculture oil palm plantation

Pia Amabelle M. Flores & Rezin G. Cabantug

ABSTRACT. X

***Keywords*:** X

10:40-10:50

106 – Yield performance of 12 promising rubber clones using different Tapping System

Sheena B. Lucena & Randy Tumacder

ABSTRACT. X

***Keywords*:** X

11:10-11:20

107 – Multilocation Trail of Ten (10) Promising Varieties of Cacao in Type II and Agro-Climatic Zone in Southern Mindanao and Northern Mindanao

Ardniel A. Baladjay

ABSTRACT. X

***Keywords*:** X

11:20-11:30

108 – Phenology, Yield and Fruit Quality of Different Pummelo Cultivars at USMARDC

Nancy E. Duque

ABSTRACT. XThe orchard with eight pummelo cultivars at the University of Southern Mindanao Agricultural Research Center (USMARC), USM, Kabacan, Cotabato was rehabilitated to determine their phenology, yield and fruit quality, and to propagate these cultivars for conservation and disposal. Pummelo trees are exiting at a distance of 6 x 7 m with nine trees per cultivar and was established in 2011. Most of the pummelo cultivars showed poor growth exhibiting yellow leaves and dry terminal twigs, They also did not produced flowers nor fruits. . The area was also weedy. To rehabilitate the pummelo trees, weeding, pruning, application of fertilizer and insect pests and disease management were done. Presently, the trees have started developing new flushes of leaves and growth is improving

***Keywords*:** cultivar, phenology, pummelo, tree, quality

11:30-11:40

109 – University of Southern Mindanao Higher Education Research: Technological Advancements and Innovation Projects

Francisco Gil N. Garcia

ABSTRACT. X

***Keywords*:** X

1:00-1:10

110 -

ABSTRACT. X

***Keywords*:** X

1:10-1:20

111 – Development and Consumer Acceptability of Mutton Based Food Products for emergencies

Jurhamid C. Imlan, Josephine R. Migalbin, Jalaloden B. Marohom, Queenie L. Rufino & Maricel G. Dayaday

ABSTRACT. X

***Keywords*:** X

1:20-1:30

112 – Carbon Stock Potential of Agroforests in University of Southern Mindanao (USM) and Arakan Valley Agricultural School (AVAS)

Florence Roy P. Salvaña

ABSTRACT. Carbon stock is the absolute quantity of carbon held within a pool at a specified time. This study generally aims to determine the carbon stock potential of agroforestry stands of two selected sites - USMARDC and AVAS, Cotabato, Philippines. Transect line method was employed which was divided in different sampling plots. Identification of trees, dbh, and tree height were gathered in each sampling plots. Aboveground biomass (AGB) values were calculated in each plot using established allometric equations. A total of 12 species of trees belonging to 5 families were identified. Among the identified species, 8 were native trees. Plot 1 had the highest AGB value while Plot 6 had the least value. Saplings and mother trees of native species were also observed during data gathering. These native trees include Diospyrus blancoi, Macaranga tanarius, Vitex parviflora, Dysoxylum gaudichaudianum, Ficus nota, Artocarpus camansi, Ficus ampelas, Artocarpus odoratissimus

***Keywords*:** trees, agroforest, climate change, native

1:50-2:00

113 – Sustainable Forage Production Systems for Ruminant Livestock at USMARDC

Mary Joy S. Cañolas, Ivy M. Pasquin, Lorelyn Joy T. Milagrosa & Geoffray R. Atok

ABSTRACT. X

Keywords**:** X

2:00-2:15

114 – (Futures Thinking) Herbicide-Based Application as Weed Management Intervention for Improved Productivity in Adlay

Baser L. Mamalac

ABSTRACT. X

Keywords**:** X

2:10-2:20

115 – Biodiversity Assessment in Key Areas for Wildlife and Nature Project (BAKAWAN Project): Assessment of Structural and Functional Biodiversity in Mangrove Ecosystem of Timaco Mangrove Swamp

Cherie C, Mangaoang & Florence Roy P. Salvaña

ABSTRACT. X

Keywords**:** X

2:40-2:50

116 – BARMM in a changing environment (Biomonitoring and Assessment of the Relationship between Marsh and Man)

Meriam Manampan-Rubio, Renee Jane A. Ele, Bona Abigail H. Husain, & Krizler C. Tanalgo

ABSTRACT. X

Keywords**:** X

2:50-3:00

117 – Spatial and Temporal Crop Diversification in Adlay-Based Cropping System for Land-use Efficiency and improved Crop Productivity and Sustainability

Nancy E. Duque, Baser L. Mamalac, Ana Rose Cunanan, & Efren E. Magulama

ABSTRACT. Adlay is an emerging and promising additional staple food crop as source of nutrients in the Philippines. However, just like in many cereal crops, its production system focuses more on monocropping and limited in diversification. Studies were conducted at the University of Southern Mindanao Agricultural Research Center (USMARC), USM, Kabacan, Cotabato to determine the crop diversification strategy in adlay-based cropping system, identify the appropriate adlay and legumes varietal combination and determine the land and economic efficiency of the cropping system. Adlay at 90 days after planting were significantly taller under solecropping than intercropping system. Adlay intercropped with peanut varieties, NSIC Pn12, NSIC Pn13, NSIC Pn16 and NSIC Pn22 had comparable heights. Height, shelling percentage and one hundred seed weight of peanut were significantly reduced by intercropping but the number of pods per plant and bean yield were unaffected. Meanwhile, adlay intercropped with different mungbean varieties were comparable in heights at 60 days after planting. However, these were significantly taller than those grown as solecrop. Mungbean grown as solecrop and as intercrop in adlay were similar in height, number of pods and one hundred seed weight. However, bean yield significantly varied. NSIC Mg17, NSIC Mg 19 and NSIC Mg 22 had higher yields than NSIC Mg21. Moreover, bean yields of mungbean in solecropping were higher than that grown under intercropping.

Keywords**:** adlay, intercroppong, mungbean, peanut, solecropping

3:00-3:10

118 – Establishment, Conservation and Utilization of Indigenous Tropical Fruit Crops at the University of Southern Mindanao

Nenita E. Olero

ABSTRACT. X

Keywords**:** X

3:30-3:40

119 – Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber

Tamie C. Solpot, Ma. Teodora N. Cabasan & Bernadith T. Borja

ABSTRACT. Leaf diseases of rubber are considered as one of the major constraints in rubber production resulting in lower latex yield. Biological control has been suggested as the most sustainable long-term solution toward disease management. In this project, the occurrence and prevalence of major and emerging leaf diseases of rubber in North Cotabato were determined and the evaluation of effective endophytic fungi against rubber diseases were done. There were seven leaf diseases of rubber observed in five municipalities of North Cotabato, with six (6) already known such as Colletotrichum leaf spot (Colletotrichum gloeosporioides), Corynespora leaf fall/spot, Phytophthora leaf fall/blight, powdery mildew,

bird's eye-spot disease, and the algal spot disease. A new report of Colletotrichum siamense causing leaf spot disease was also described and confirmed. On the other hand, of the 321 endophytic fungi isolated from healthy rubber leaves, 18 were found non-pathogenic (both in wounded and unwounded) and exhibited promising results in in vitro assays and were thereby trialed out in vivo experimentation with protective and eradicative set-ups.

Keywords**:** rubber, endophytes, screening, biocontrol, leaf diseases

3:40-3:50

120 – University of Southern Mindanao Futures Thinking: Food and Health Security, Systems, Innovations and Sustainability

Francisco Gil N. Garcia

ABSTRACT. Futures thinking is a future-oriented mindset through a systematic method of exploring alternative futures. It enables people to be future-ready for possible scenarios and improves the quality of their decisions to be more strategic and far-sighted. However, there is a need to capacitate the manpower in various entities in the Philippines to practice and utilize the Futures Thinking ideas in different fields. There is a great need to create futures for long-term agricultural developments, innovations, and systems to ensure sustainable production, profitability, and food security. The objective of this program is to provide directions through Futures Thinking-based capacity building and collaborative initiatives for food security, systems, and innovations in USM and Region 12 state universities and colleges. This also included Research, Development and Innovations projects in Food Production, Security, Systems and Sustainability in Region 12 and USM.

Keywords**:** futures thinking, innovations, research, sustainable development goals

9:30-9:40

201 – Program: Land management of rubber-based systems in Southern Philippines PROJECT 1. Effective Rubber Based Cropping System in Southern Philippines

Rezin Cabantug

ABSTRACT. X

Keywords: X

10:15-10:25

202 – Program: Land Management of rubber-based systems in Southern Philippines PROJECT 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation for Rubber Cropping System

Leandreux Ocasion

ABSTRACT. X

Keywords: X

9:50-10:00

203 – Program: Land Management of rubber-based systems in Southern Philippines PROJECT 4. Development of Cost and Effective Pest and Disease Management of Rubber and Intercrops

Joan P. Sadoral

ABSTRACT. X

Keywords: X

10:20-10:30

204 – Utilization of Corn Sprouts as Fodder for Livestock Production

Mary Ann D. Rama, Efren Magulama, & Josephine R. Migalbin

ABSTRACT. X

Keywords: X

11:15-11:25

205 – Lactic Acid Bacteria Serum Production for Silage Making

Josephine R. Migalbin, Bernadith Borja, & Neil Pep Dave Sumaya

ABSTRACT. Lactic acid bacteria (LAB) inocula are essential in the preservation and fermentation of fodder crops due to their ability which successfully lower pH, prevent survival of undesired microorganisms, and regulate nutrient loss in fermented silage. This study aimed to maximize efficient culture media for LAB production, identify different LAB in various ratios of rice wash and milk, determine the population count of LAB cultured in various types of milk media, isolate and identify effective LAB for napier grass silage, mass produce identified LAB for napier grass silage production. The study was carried out with four treatments and five replications using Two Factorial Analysis of Variance. The treatments for the component 1 are the following: Distilled Water: Rice Ratio) 1:1 (50 gram rice, 50 ml distilled water), 2:1 (50 gram rice, 100 ml distilled water), 3:1 (50 gram rice, 150 ml distilled water), 4:1 (50 gram rice, 200 ml distilled water). Component 2: Treatment I- RW + Buffalo's Milk (Pasteurized),Treatment II- RW+ Buffalo's Milk (Non Pasteurized),Treatment III- RW+ Cow's Milk (Pasteurized),Treatment IV- RW+ Cow's Milk (Non Pasteurized) and Treatment V- RW+ Skim Milk. Component 3, Treatment I- Control (Without LAB), Treatment II - $7x10^{10}$ cfu/ton of napier grass , - Treatment III- $8x10^{10}$ cfu/ton of napier grass,- Treatment IV- $9x10^{10}$cfu/ton of napier grass,- Treatment V - $10x10^{10}$cfu/ton of napier grass and - Treatment VI- $11x10^{10}$cfu/ton of napier grass. Based on the initial result the optimum ratio of rice wash and water fermentation is 1:1. On the other hand, three colonies have been discovered and are, respectively, yellow, white, and brown which are subject for further microscopic examinations.

***Keywords*:** Lactic acid bacteria,silage, rice wash, milk

10:40-10:50

206 – Development of Herbal Mosquito Repellent from Leaves and Flowers of Marigold (*Tagetes erecta*)

Sedra A. Murray & Elma G. Sepelagio

ABSTRACT. X

***Keywords*:** X

11:10-11:20

207 – Accelerated R&D Program for Capacity building of Research and Development Institutions and Industrial Competitiveness: NICHE centers in the regions for R&D (NICER) Program: Cacao R&D Center NICER Project 1 – Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Profitability

Edward A. Barlaan

ABSTRACT. The validated SSR markers for cacao are essential tools for identification of genuine varieties to guarantee planting of true-to-types to ensure increased productivity and profitability. The study aimed to identify and molecularly fingerprint parental sources of recommended cacao HYVs and true Criollo for multiplication of quality planting materials and to propagate and distribute the certified true-to-type cacao varieties as mother plant

sources or genetic stocks. Functional SSR markers were used to validate NSIC recommended varieties and differentiate true Criollo types from non-Criollo accessions. Fifty accredited nurseries across different regions in the Philippines agreed to collaborate with the project. DNAs of collected leaf samples were extracted, quantified and used for PCR amplification and gel electrophoresis. 189 claimed Criollo-types, 5 Forastero, and 6 Trinitario from various regions of the Philippines were molecularly analyzed using SSR markers. 115 claimed Criollo-types were partially evaluated at the morphological level based on the available descriptors. For NSIC cacao varieties, most varieties sold in the nurseries are BR25 and UF18. Out of 189 UF18 mother plants analyzed, 11.64% (22) were found out that are not authentic using C7729t1 marker while BR25 had 12.93% (19) out of 147 mother plants using C8223t1 marker. Different regions of the Philippines and other government agencies like the Department of Agriculture (DA), the Bureau of Plant Industry (BPI-NSQCS) and also other private companies requested to analyze their samples. Out of 292 samples sent, 12.33% (36), 10.62% (31) were authentic BR25 and UF18 respectively. Trained 25 BPI personnel on molecular training. 15 accredited nurseries were monitored from Region XII. Molecularly verified and BPI-certified cacao seedlings of UF18 and BR25 were propagated and distributed to different cacao nursery operators and farmers in Regions XI and XII. So far, a total 3,880 cacao quality planting materials were already distributed to 75 cacao nursery operators and private individuals.

***Keywords*:** Cacao, NSIC varieties, Criollo, SSR markers, quality planting materials

11:20-11:30

208 – NICER Project 2 – Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement

Gwen Iris D. Empleo

ABSTRACT. The identification of Theobroma cacao L. clones that possess desirable traits for varietal improvement is essential to meet changing production and market conditions. This project addresses the problems on the relatively low yield and low bean quality in cacao, and the prevailing diseases and pests affecting cacao productivity. The main goal of this project is to carry out effective cacao breeding strategies for the development of cacao varieties with improved yield, bean quality; and resistance to diseases and pests. The project aims to rehabilitate the existing USM cacao gene bank; enhance the USM cacao gene bank through the introduction of additional cacao clones; evaluate the morphological and agronomic characteristics of the cacao clones for the development of the Philippine cacao catalogue; develop cacao hybrids with high yield, bean quality, or resistance to pests and diseases; and validate the F1 identity of the products of crosses using molecular approaches. To date, scions from 66 cacao clones were collected from the Davao, Bukidnon Province, and the Camiguin Island, and transplanted at the gene bank. Also, cacao clones from the International Cocoa Quarantine Center (ICQC) at the University of Reading in the UK were received, grafted and maintained at the nursery. A total of 72 fruit-bearing cacao clones were partially evaluated at the morphological level using the available descriptors for the development of the cacao catalogue. Seedlings from 21 F1 crosses and 4 three-way crosses developed from selected parents through hand-pollination are transplanted in the gene bank for evaluation.

***Keywords*:** Cacao, gene bank, introduction, hybridization, breeding

11:30-11:40

209 – NICER Project 3 – Development of Optimized Post-Harvest Processing Approaches for improved Quality of Cacao Beans

Renel M. Alucilja

ABSTRACT. Cacao bean quality significantly influences the market price of cacao-based products. Limitations such as inadequate knowledge and expertise in post-harvest processing technologies, unavailability of post-harvest processing facilities, and lack of access to market information and high-value markets must be addressed. This study aimed to develop optimized post-harvest processing approaches for improved quality of cacao beans. The design for the development and optimization of post-harvest machines was crafted. Fabrication and modifications of the machines and prior runs were done in preparation for the operational testing. Benchmarking surveys for the cacao pod storage, fermentation, drying, and dried bean storage were done in 17 different sites of Region XI, XII, and XIII to determine the common practices for innovation and optimization. Preliminary studies on fermentation and drying, and conducted a three-factor experiment on pod ripeness and storage, and wet bean draining were conducted and samples were submitted for analysis. The physico-chemical analysis determined the different nutrient content and chemical compositions of processed cacao beans. A total of 72 samples were collected and among the bean samples, fermentation of 5 to 9 days was slightly acidic in terms of pH and has a higher percentage value of titratable acidity (acetic acid content). Direct sun drying of 7 to 9 days and mechanized drying of cacao beans indicated a lower percentage of moisture and fat content. Meanwhile, the ash content of all the collected cacao beans lies on the typical value and has a higher percentage of carbohydrates. Region XII recorded higher protein content compared to samples collected in Region XI.

Keywords**:** cacao, benchmarking, optimization, physico-chemical, post-harvest

1:00-1:10

210 – SMART Cacao Budwood Nursery and Greenhouse for Production of High-Quality Planting Materials

Edward A. Barlaan

ABSTRACT. Cacao production is constrained by several factors including low yield, lack of quality planting materials, limited area of cacao production, lack of awareness and technical know-how on improved technologies, limited technical support, and lack of access to market information and high-value markets. The study generally aimed to establish smart cacao budwood nursery and greenhouse for authentic NSIC and Criollo varieties and other promising accessions as resources for quality planting materials (QPMs), genetic improvement, development, and application of improved cacao-based agricultural systems. Specifically, it aims to assess at genomic level the purity of the putative true Criollo cacao types for production of QPMs; determine the percentage of Criollo incorporated in NSIC varieties at genomic level for cacao varietal improvement on bean quality; develop and evaluate smart and precision agriculture technologies in budwood nursery and greenhouse for data acquisition, analysis, and monitoring; and develop mass production, distribution, and

monitoring systems of cacao quality planting materials for sustainable utilization. Putative Criollo types were identified through phylogenetic analysis using SSR markers specific for Criollo. Samples with 80%-100% coefficient were selected for genome sequencing. Leaf samples of 26 putative Criollo were collected for DNA extraction. Scions of 26 putative Criollo were grafted for the establishment of smart cacao budwood nursery. The land area for the smart cacao greenhouse and budwood nursery had a total dimension of 100 m x 110 m. Land preparation and field layout were conducted in preparation for the establishment of the smart cacao greenhouse and budwood nursery. Banana plantlets were planted as partial shading for the cacao seedlings. Mowing and herbicide applications were done for field maintenance. Post-qualification and evaluation for the design, delivery and installation of greenhouse and drip irrigation system are underway. Soil bagger system was already awarded and machine prototyping is ongoing. The development and application of smart or precision agriculture in the budwood nursery and greenhouse are employed for the improvement and modernization of cacao-based farming and agricultural systems for increased productivity and profitability.

Keywords**:** cacao, budwood nursery, Criollo, greenhouse, smart agriculture

1:10-1:20

211 – Development of Corn Hybrids and Synthetic with Tolerance to Herbicide

Jessie Elarde

ABSTRACT. X

Keywords**:** X

1:20-1:30

212 – (Futures Thinking) Cacao-Based product Development and Innovation Using Butter and Powder

Harem R. Roca & Jane R. Desamito

ABSTRACT. X

Keywords**:** X

1:50-2:00

213 – Developing Land Management Options for Diverse Cacao-Based System in Mindanao

Mel Chrisel Sales

ABSTRACT. XCacao production in Mindanao is faced with several challenges to include decline soil productivity, and the impact of climate change which resulted to production supply gap and quality issues. Hence, this project was implemented to provide scientifically-based mitigation approach through small-holder cacao farmers empowerment in addressing

climate change derived impacts and arising market challenges by providing them with the appropriate cacao farming technologies and capacity to satisfactorily harnessing available local resources towards quality and safe cacao production. The project specifically aims to determine effective, regenerative and climate resilient soil management options for safe and sustainable cacao-based cropping system in Davao City and North Cotabato and showcase the advantages of the different soil management technologies to cacao farmers and other players of the industry. To determine the effective, regenerative and climate resilient soil management options for safe and sustainable cacao-based cropping systems, two field experiments were established located in Site 1 - Brgy. Sirib, Calinan District Davao City and Site 2 - USM, Kabacan North Cotabato. In Site 1, the field experiment was conducted in RCBD with 7 treatments (farmer's practice, OF, Lime, mulching + OF, ½ RR + OF, RR) whilst Split Plot Design with 2 mainplots (cropping systems) and 5 subplots (Control, RR, Lime, OF, OF + Lime) were employed in Site 2. Baseline report was developed for the experimental sites and data gathering and analysis is continuously done. Mentoring activities with the cacao cooperators were also conducted in Davao City (Site 1) and North Cotabato (Site 2). There were 17 cacao cooperators selected and mentored in Site 1 and 15 in Site 2. Four topics were delivered in Site 1, whilst 2 topics in Site 2. Topics delivered in Site 1 were as follows: a) Importance of Research and Data Recording in Cacao Production Management; b) Climate Change Effects and Mitigation; c) Cacao Characteristics and Requirement; and d) Composting and Sustainable Agriculture. While, topics delivered in Site 2 were: a) Importance of Research and Data Recording in Cacao Production Management; b) Climate Change Effects and Mitigation. Benchmarking of the major cacao producing areas in Mindanao was also conducted as an initial activity to showcase the advantages of the different soil management technologies to cacao farmers and other players of the industry. KII with cacao cooperative leaders, processors and cacao farmers and soil and leaf sampling were done in the areas of Region XI (Davao City, Davao del Norte and Davao Oriental), XII (Libungan, Magpet, Pigcawayan, and President Roxas), and XIII (Hinatuan, Surigao del Sur).

***Keywords*:** Soil Management, Climate Resilient, Field Experiment, Mentoring

2:00-2:10

214 – Steady-State Hydraulic Numerical for Optimized Water Distribution Water Distribution Network Modelling: An Application of Selected Hydraulic Solver

Ma. Dely P. Esberto, Christopher A. Benito & Zherwin R. Descallar

ABSTRACT. Control valves are used to mitigate problems on the hydraulic integrity of a water distribution system. System failure occurs when there is a high pressures within the network that can damage the pipes, cause leakages and unsatisfactory water supply. However, there is no fixed procedure as to how these valves should be placed within the network, thus, several hybrid hydraulic solvers were developed to save time and effort in balancing the water system. The output of which would be the best optimized network where the valve placement seem to give the best option addressing the issues mentioned earlier. The reliability of these solvers were verified using manual calculations or comparing the results with other solver predictions. Very few studies considered validating the performance and reliability of the hydraulic solver to real life water system. This study aimed to provide a comprehensive hydraulic analysis using the steady-state hydraulic numerical solver applied to an existing network to improve the water system services to the community in Ganatan, Arakan Cotabato. Specifically, this study aims to determine the best optimized WDN model

using the selected steady-state hydraulic numerical solver; develop the automated pressure monitoring device (APMD) for remote data observation and develop a computer program in GUI format for the steady-state hydraulic Numerical Solver. The study is consist of three (3) main components namely; selection of best optimized WDB model; development of pressure automated monitoring device; and development of a Graphic User Interface Platform for the Steady-State hydraulic Numerical Solver. In this study, it is expected that the predictions provided by the numerical solver will be similar to the actual readings obtained from the pressure logs via remote monitoring. Consequently, the hydraulic anomalies of the existing water system will be corrected using the best optimized model that can be produced by the hydraulic solver simulations.

Keywords**:** X

2:10-2:10

215 – Optimization of Irrigation Flow Through Conduit Microhydropower to Generate Electricity for Off-grid Barangay of Kabacan, Cotabato

Marilyn S. Painagan, Tito Jun T. Tidula, Benhamin I. Mamalo, & Jonnah Mae A. Casalan

ABSTRACT. This project intends to set-up a locally fabricated micro hydropower system that will generate 15- 20 kW of electricity, can be transported in limited accessibility areas and can be installed on low head and low discharge concrete channels. This micro-hydropower system aims to electrify the households along an off-grid area of sitio Silangan, brgy. Pisan, Kabacan, Cotabato. The micro-hydropower was designed using low-cost materials and was fabricated locally, the outer diameter and length of the screw runner is 36 cm and 100 cm, respectively. The distance between pitch is 7 cm and the blade clearance from the housing is 2 cm. The height of the inlet is 16 cm and the angle of inclination is 9 degrees. The prevailing velocity of the flowing water is 0.591 m/s and water depth is 23 cm. These parameters produced an average turbine RPM of 160. Several parameters that are crucial in the design are still undergoing several iterations in order to achieve the desired RPM. This project also aims to promote opportunities with energy resources for farmers' utilization and livelihood (POWERFUL extension), wherein beneficiaries are being trained in manufacturing and marketing a low-cost micro-hydropower turbine.

Keywords**:** Archimedes screw turbine, low-cost materials, micro-hydropower, off-grid, water velocity

2:40-2:50

216 – (Futures Thinking) Formulation and Optimization of Functional Cereal-Based Snack Foods

Maribelle T. Piamonte, Apple U. Revilla, Oscar Q. Magbanua, Ian Jade A. Flores, Ivy Mar B. Cabornida,

ABSTRACT. The prevalence of disease caused by eating unhealthy food and inactive lifestyle affects not only adults but younger generation as well. Nowadays, consumers are concerned on their food choices as it affects their health and wellness. Thus, this study aims to develop a functional cereal-based snack foods employing enhanced processing

technologies. The development was conducted in three stages: screening of suitable functional ingredients, formulation & optimization and quality evaluation. For cereal-based nutri-drink, identified suitable functional ingredients were the following: Cereals (rice, corn, adlai, soy bean) salt, vanilla, cocoa powder; for the cereal-vegetable based patty, screened ingredients includes the following: Corn Patty, corn kernel, black beans, breadcrumbs, onion, garlic, cumin powder, paprika powder, salt, pepper and vegetable oil and for Rice Patty, white rice, breadcrumbs, parmesan cheese, onion, garlic, salt, black pepper, and vegetable oil for cereal based snack foods, several trial runs were done for the development of cornicks using USM white corn Var 6 and Var 10. Although optimization of the product is still ongoing, initial sensory assessment of the product as described by the panel was "like moderately" (?)

Keywords**:** Corn, Rice, Adlai, Soy bean, Healthy snack foods.

2:50-3:00

217 – University of Southern Mindanao-Treelife Coco Sugar Research and Development

Maria Elena M. Neyra-Tanabe

ABSTRACT. X

Keywords**:** X

3:00-3:10

218 – (Futures Thinking) Development and Halal Verification of "Plant-Based Protein-Rich" Feed for Halal Grown Poultry Products

Jurhamid C. Imlan, Quennie L. Rufino, & Mary Ann B. Rama

ABSTRACT. Halal industry plays an important role, especially for Muslims. In choosing animal-based halal food products, a Muslim should be concerned not only about the sources of the animals and the slaughtering process, but also the way the animals were raised and fed. The study aims to develop and verify the formulation of Halal feeds based on protein-rich plants for the production of Halal-grown poultry products. The research focuses on three main components: In Component 1, the nutritive value of potential protein-rich plants grown in Mindanao is determined, including dry matter, ash, crude protein, crude fiber, crude fat, calcium, and phosphorus. This characterization will establish a list of suitable protein-rich plants for the formulation of Halal feeds. Component 2 involves formulating Halal feeds for broiler chickens using protein-rich plants. The nutritive value of the formulated Halal feeds is evaluated, and Halal verification of the plant-based feeds will be conducted. In Component 3, the growth performance and carcass quality of Halal-grown broiler chickens fed with the formulated Halal plant-based feeds is determined. The study evaluates the quality of the poultry meat in terms of moisture, protein, fat, ash, fiber, cooking yield, pH, color, and water holding capacity. The team conducted a review of different raw materials for Halal feeds, characterized the feeds' raw materials, analyzed their nutritive value and essential amino acid profile, formulated Halal feeds based on evaluated protein-rich plants and conducted proximate analysis. Apparently, the project compiled a list of locally available protein-rich

plant sources for Halal feeds and developed Halal plant-based feeds. The research contributes to ensuring the production of Halal-certified poultry products and improving the quality of poultry meat in a Halal environment. Additionally, the study aims to establish partnerships and linkages for future collaboration in the field of Halal feed development and Halal verification.

***Keywords*:** Halal feeds, Poultry products, Protein-rich plants, Halal industry, Halal verification

3:30-3:40

219 – Fruit Quaility Improvement in Cabarao Mango though Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genom-wide Association Studies (GWAS)

Edward A. Barlaan

ABSTRACT. Mango (Mangifera indica) is one of the economically important fruit crops for local consumption and export. However, mango production in the Philippines is constrained by post-harvest diseases affecting fruit quality and yield. These diseases include stem-end rot (SER) caused by Lasiodiplodia theobromae and scab caused by Elsinoë mangiferae. There is a need to identify sources of resistance to these pathogens from various mango strains, cultivars and varieties to improve the Philippine mango for resistance to SER and scab. The study aimed to isolate and molecularly identify the causal pathogens and develop molecular markers associated with scab and SER resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utility in marker-assisted selection/breeding. Besides carabao mango and other mango cultivars were used as potential sources of resistance to SER and scab. One hundred eight mango fruits were inoculated with causal pathogens of stem-end rot disease and assessed based on the degree of infection. Results revealed that Huani and Irwin were identified as resistant to stem-end rot disease. For scab, attempts were made to determine the causal pathogen associated with scab through isolation and inoculation of putative fungal pathogens. The grafted mango seedlings were used for evaluation of resistance against scab disease through the spraying method, leaf and fruit patching method, mycelial plug, and combination of all putative isolates. However, no typical symptoms of scab were observed in all studies. Alternatively, evaluation of scab disease reactions on sixty-eight other mango cultivars was done under natural field conditions. Results revealed that Malalag Bar Accession was identified as resistant to scab. For GBS and GWAS analysis, genomic DNAs of 73 other mango cultivars were extracted and quantified and submitted for GBS library construction and bioinformatics analysis utilizing the service of DArT Company.

***Keywords*:** Mango; Genotyping-by-sequencing (GBS); Genome Wide Association Studies (GWAS); Stem-end rot; Scab disease

3:40-3:50

220 – Digital screening promotion of technologies

Pia Amabelle Flores

ABSTRACT. One of the recent challenges of startups in the rural setting nowadays is the promotion of its products to a wider range of target market. Lack of promotion may impede a crucial progress of the product that could have benefited from the significant promotion in the region.With this, a substantial collaboration between DOST- 12 and USM ATBI can be mediated for screening viable and science-and-technology (S&T) based products in the region that has potential for business incubation.The project, D-SPOT, is an innovative intervention in promoting local products. Most importantly, D-SPOT supports mobilization of innovative ecosystem which in the long run paves way for regional development. Within the first quarter of its implementation, D-SPOT has conducted exploratory meetings with important key players of promoting local products in the region. This was crucial in establishing potential partnerships in the future. D-SPOT also conducted preliminary survey to assess the prospect of digital marketing in the region from respondents across the five provinces. In the present, D-SPOT has launched digital promotions of local products through social media platforms. The project is expected to complete the following objectives within the remaining quarter: (1) Identify local products that have potential for digital promotion and technology business incubation, (2) Evaluate the influence of digital marketing platforms on consumer preference of the region; (3) Enhance promotion of local products and startups in the region through digital marketing; and, (4) Intensify linkages and networking of products in Region 12.

***Keywords*:** Digital promotion, local products, digitalization, social media platform, regional development

9:30-9:40

301 – Infograp ng mga impormasyon hinggil sa omicron variant para maiwasan ang pagkalat ng COVID-19 at ang benepisyo ng pagbabakuna: Isang Teknikal na Pagsasalin

Radji A. Macatabon

ABSTRACT. X

Keywords: X

9:40-9:50

302 – Strengthening Mother-tongue based Education of Elementary Teachers in DepEd Cotabato/MBHTE BARMM though Instructional Materials Development and Validation

Philip Lester Benjamin & Sandra A. Nanding

ABSTRACT. This extension project aims to strengthen mother-tongue based education in the DepEd Cotabato Division by focusing on instructional materials development and capacity building for elementary teachers. The project is motivated by several key considerations, including the promotion of linguistic and cultural diversity, improvement of student learning outcomes, and addressing the specific needs of students. By using the mother-tongue as the medium of instruction in the early years of education, the project aims to preserve and promote the linguistic and cultural heritage of students in the DepEd Cotabato Division. Research indicates that students who learn in their mother-tongue achieve better academic outcomes, and therefore, this project seeks to enhance student learning outcomes by providing tailored instructional materials that align with their linguistic and cultural background. Additionally, the project aims to build the capacity of teachers to effectively teach in the students' mother-tongue. To achieve its objectives, the project will develop high-quality instructional materials specifically for elementary mathematics. These materials will be designed to engage and educate students effectively. The developed materials will then undergo validation through data analysis and feedback from teachers, students, and parents. This validation process ensures that the materials are aligned with the curriculum and meet the needs of the students. Ultimately, this extension project strives to enhance mother-tongue based education in the DepEd Cotabato Division by providing customized instructional materials and improving the capacity of teachers. By doing so, the project aims to improve student learning outcomes and promote linguistic and cultural diversity in the region.

Keywords: Mother-tongue based education, instructional materials development, elementary teachers, DepEd Cotabato Division, instructional materials validation

9:50-10:00

303– Adopt a Madrasah for Knowledge and Skills Development in Teaching Pedagogy of Azatidz in Barangay Aringay, Kabacan, Cotabato

Sofia G. Molao, Remedios C. Kulidtod, Norjaida D. Maliga, Jikiri M. Entol & Abdulnasser G. Makalugi

ABSTRACT. This extension project entitled: Adopt a Madrasah for Knowledge and Skills Development in Teaching Pedagogy of Azatidz In Barangay Aringay, Kabacan, Cotabato were conducted with the following objectives: Generally, this study aimed to Knowledge: to develop full potential on the Pedagogical knowledge and skills of the azatidz. Skills: to show their learning through hands-on and output-based activities, and actual teaching demonstration. Attitude: to accept the importance of learning pedagogical knowledge and skills for self-improvement as a teacher, to motivate their learners and improve the quality of learning in the madrasah. Specifically, it aimed to: 1. adopt a Madrasah; 2. capacitate azatidz and administrators of Madrasah in terms of Lesson Planning, Instructional Materials making and pedagogical skills development; and 3. actual teaching demonstration for azatidz. There were five (5) components in this extension project: 1. Lesson Planning, 2. Instructional Materials, 3. Teaching Strategies and Classroom Management, 4. Student Learning Assessment Methods, and 5. Curriculum Development. The project leader made a letter to conduct project addressed to the Moder/Principal of Madrasahtul Laguinding Al-Islamie and to the Barangay Captain of Aringay. A conduct of Training Needs Assessment was followed. The IMEAS Extensionist made a training design based on the results of training needs assessment as well as prepared and signed a Memorandum of Agreement (MOA) between IMEAS-USM, the Madrasah, and Barangay Local Government of Aringay. Courtesy Call and Inception Meeting was done to the beneficiaries. Pre-Evaluation (Topical) was conducted to measure the prior knowledge of the participants. There were fourteen (14) participants/beneficiaries in this extension project. The Workshop on Lesson Planning for Azatidz (Component 1) leader and members made a PowerPoint presentation about Lesson Planning. Aside from English Language, the leader and members used Tagalog and Arabic Languages. Hands-on activities was done during the conduct of workshop.

Keywords: Azatidz, Madrasah, Pedagogy, Teaching, Skills development

10:20-10:30

304 – CASAMA-Comprehensive Assistance and Services Authentic and Meaningful Action-Phase 2: Utilization of Local Coconuts Fruits for VCO Production and VCO Enhace Soap

Cherie C. Mangaoang & Marivic D. Candari

ABSTRACT. Virgin coconut oil (VCO) is the newest high-value coconut product which has gained much attention lately due to its human nutraceutical benefits and as a functional food. The growing demand for VCO can be attributed to an increasing number of published books and results of medical research concerning the health benefits of coconut oil to humans. One of the agricultural products that the Municipality of Columbio is well-known for is coconut, however, the price in the market is unpredictable. Having an alternative product for coconut might help farmers to maximize their coconut produce. It is therefore the aim of this study to teach the Columbio small coconut farmers to process their coconut produce into virgin coconut oil to improve their livelihood and at the same time promote its health benefits. During the pre-implementation phase, a series of activities were conducted such as coordination meetings with partner agency, profiling of the target participants, conducting need assessment, and inception meeting. A total of 25 women members were trained in

Financial Planning and Management and facilitated by the faculty of the Mathematics and Statistics Department. Forty-five percent (45%) of the target participants were 41-60 years of age, with an income of 1000-10,000 per month, and dominated by Ilocanos.

Keywords**:** community empowerment, quality of life, high-value product

10:30-10:40

305 - Integrated Services for Enhanced Education (I-SEE): Connectivity Resilience Project Amidst COVID-19 Pandemic

Janice M. Bangoy

ABSTRACT. X

Keywords**:** X

10:40-10:50

306 – Development of Community-Based Tourism in Kabacan, Cotabato

Meldred F. Semblacena

ABSTRACT. X

Keywords**:** vX

11:10-11:20

307 - Bionihan Para sa Kalikasan: Community Empowerment Towards Conservation

Florence Roy P. Salvaña, Cromwel M. Jumao-as, & Cherie C. Mangaoang

ABSTRACT. An ordinance protecting and conserving bats and other wildlife species was crafted and approved in the Municipality of Kabacan. This ordinance includes fines and penalties of individuals who will be caught harvesting wildlife species. It is therefore the aim of this proposal to enhance Bantay Kalikasan members on proper monitoring and reporting of the current status of wildlife in their respective areas. Pre-implementation activities was done including meetings with stakeholders, inception meeting, participant profiling and needs assessment in Brgy. Cuyapon, Kabacan, Cotabato. Needs assessment revealed that participants were able to identify few wildlife species in Ligawasa Marsh. However, identification techniques were purely on the recognition level which need to be enhanced through capability building.

Keywords**:** biodiversity, conservation, locals, community based management, capacity building

11:20-11:30

308 – CA-CARE: Capacity and Resiliency Enhancement for Agricultural Technologist of Cotabato Province

Noe S.Mamon, Jr. & Gelyn V. Amilbahar

ABSTRACT. Adopted current technologies and CA pool of experts will help capacitate the Agricultural Technologists of the LGU within Cotabato Province. The college can offer the following technical services, eg. pests and disease diagnosis, crop suitability and nutrient management, crop pre and post-harvest processing, entomological audit for stored product and structural pests, livestock and poultry production and management through consultancy and provisions of sustainable recommendations and advisories. Training needs assessment lays the essential foundation for determining clientele's actual and real needs and how they can benefit from the training. This was done through online survey among identified AT's. To further verify and provide more in depth assessment on the actual needs of MAO-Antipas, its head of office was interviewed as key informant (KI). The result of conducted training needs assessment among agricultural technologists in DA-Antipas recommends the conduct of capacity enhancement training on the Entomological Audit for Stored Product and Structural Pests and Crop Suitability Assessment (GIS). However, the Top 1 among other training needs being supplemented by the respondents and the pipeline need of the municipal agriculturist office was the vegetable seed production, gene banking and seed storage operations thus this training will be prioritized. Training on Seed Collection, Keeping, Conservation, and Dispersal will be conducted to the target beneficiaries. In addition, lecture series about Neglected and Underutilized Vegetable Species will also be delivered. The aforesaid training will be conducted at the Antipas' Demo Farm and will be facilitated by selected faculty members of CA-USM.

Keywords**:** Capacity, enhancement, seed, vegetable, gene-banking

11:30-11:40

309 - Farmers Field School (FFS): Technology Delivery System for Enhancing Skills on Swine Production and Artificial Insemination

AP Warren P. Adamat & Vrenelie II D. Flores

ABSTRACT. This project utilizes a technology delivery system designed to improve farmers' abilities in artificial insemination and swine production. The system provides easy access to information and training materials by fusing digital technologies, educational resources, and hands-on training. To enable productive learning experiences, it combines interactive learning modules, assessment exercises, field training, and actual teaching opportunities. To guarantee comprehensive learning and skill growth, the system also includes on-site training sessions and progress monitoring. The technology delivery system helps the swine business and large ruminant farmers remain viable and profitable by providing them with the knowledge and abilities they need.

Keywords**:** Swine production, Artificial insemination, Large ruminants, Livestock, Animal raisers

1:00-1:10

310 – Gender Research and Capability Building in Extension Projects: Exploring Engagement, Opportunities and Entry Points

Glyn G. Magbanua

ABSTRACT. x

Keywords: x

1:10-1:20

311 – Livelihood Enhancement through Agricultural Products

Leo M. Gayao, Jane R. Desamito, Karizza Jane B. Pejaner, & Sambay P. Mla

ABSTRACT. The first and second quarters of the project Livelihood Enhancement through Agricultural Products (LEAP) at Barangay Sinapangan, Libungan, Cotabato was spent for the pre-implementation phase. The project aims to improve the income and competitiveness of mothers and out-of-school youth in the community. Before conducting the needs assessment, a meeting with the barangay captain to discuss possible project activities and identify community needs was conducted. Livelihood needs were assessed after using a methodology based on community participation and a standard questionnaire. Findings from the needs assessment revealed that farming is the main source of income for all participants, with corn being the primary crop grown. The participants faced various challenges such as rat infestation, extreme weather conditions, lack of farming knowledge, high input costs, inadequate farm-to-market roads, and retail business monopolies. Participants expressed the need for goats, vegetable gardens, marketing strategies, and product development. Additional training and support were also identified as needs, including online marketing and the establishment of a cooperative marketplace in the community. Coordination meetings, MOA signing, beneficiary profiling, and community organizing were also part of the pre-implementation activities. However, MOA is still in the process stage. The development of Information, Education, and Communication (IEC) materials was made using Bisaya and English.

Keywords: Agricultural products, farming, livelihood, mothers, out-of-school youth

1:20-1:30

312 - Knowledge and Skills Advancement for the Ambulant Food Vendors in Kabacan, Cotabato

Melchie G. Palapar, Maribelle T. Piamonte, & Shirl May M. Bebit

ABSTRACT. Organizing and profiling, Coordination Meeting, Preliminary Assessment and Inception Meeting were the methods used in the pre-implementation of the KASA Project for Ambulant Food Vendors in Poblacion Kabacan while Lecture, Discussion, and Demonstration were used during the implementation of the Project. There were 31 target beneficiaries have been reached based in the most recent sessions. Most of the Ambulant Food Vendors came from the Población, Kabacan, female, married, Ilocano, and affiliated in Christian religion. They were mostly college graduate, having 6-7 members in the family,

never attended any relevant trainings and dependent in street food vending activity as their main source of income. Ambulant Food vendors' knowledge was analyzed to have a "less knowledgeable" in general. Establishes a Support of Housekeeping Advancement, Food Trends, Safety & Food and Beverage Services (shafts & fabs) training for ambulant food vendors through lecture and Discussion was realized on May 01, 2023. Particularly, Ian Jade A. Flores delivered the topics in Food Safety and Security, food hygiene, food safety, codex Alimentarius, food borne and poisoning, food hazard, RA 10611, FBOs, Rules and Social Responsibilities, prohibited Acts, penalties and Sanctions for unlawful Acts in One and a half hour. Prof. JMJSON C. Bautista conducted and delivered Food and Beverage Services while Prof. Shirl Mae M. Bebit conducted and delivered topics on 7S under Housekeeping Services of Ambulant Food Vendors on same date. Proper service, dish out, handling trays, welcoming the guest and bidding goodbye as well as the Housekeeping Services specifically 7 S were completely delivered in 3 hours allotted time. Prof. JMJSON C. Bautista and Prof. SM Bebit Highlighted the System, Safety, Service, Style and Skills (5s) Demonstration for Ambulant food vendors on food and beverage, and housekeeping Services on the same.

Keywords: Ambulant Food Vendors, Knowledge, Skills, Advancement, Itinerant, Semi Static, Ambulant Vending

1:50-2:00

313 – Juan Food: Enabling 4Ps Beneficiaries Through Community Garden in Support for Household Food Security and Livelihood as Response to COVID-19 Pandemic

Mary Rodelyn A. Cariaga

ABSTRACT. x

Keywords: x

2:00-2:10

314 – CAPE 2- Consultancy for Agricultural Productivity Enhancement Program

Francisco Gil N. Garcia, Edward A. Barlaan, & USM Experts

ABSTRACT. x

Keywords: x

2:10-2:20

315 – PROJECT 6. Capability Building of Rubber Stakeholders and Role of Women and their Children Natural Rubber Industry in Agusan del Sur and North Cotabato

Mary Rodelyn A. Cariaga

ABSTRACT. x

Keywords**:** x

2:40-2:50

316 – "Laro Mo, Sagot Ko" A Sports Management Skills Development Project

Cheeze R. Juanito

ABSTRACT. x

Keywords: x

2:50-3:00

317 - Hakbang para sa Pagbabagong Lubos (HAPLOS) para PWUDS: A Community Based Fitness and Livelihood Project

Moreno B Java, Jr., Marlene E. Orfrecio

ABSTRACT. x

Keywords**:** x

3:00-3:10

318 - Kabataan Kontra Droga at Terrorismo (Kkdat): Sports Development Program

Moreno B. Java Jr.

ABSTRACT. x

Keywords**: x**

3:20-3:40

319 - YES, through SSTAMP: Youth Engagement in Sports through Sustainable Sport Training and Management Program

Elpedio A. Arias, Moreno B. Java Jr., Vinus P. Java & Eduard S. Sumera
ABSTRACT. x

Keywords**: x**

3:40-3:50

320 - HOPE (Holistic Opportunities for Progress and Empowerment) for Student Mothers

Jacinta T. Pueyo, Altair R. Neri, & Vivekeh D. Bat-og

ABSTRACT. xThe narrative report shows the rationale and the objectives of the project which are to increase knowledge, assist student mothers, either single or married, and other girls with practical and strategic skills and knowledge system needed to cope with their conditions as parents and students. More so, this also presents the methodology used to implement Project HOPE to the student-mothers enrolled at USM PALMA, and the accomplishment done, to wit: Consultation and Dialogue, Needs Assessment and Establishment of Student Mothers Organization, Inception Meeting, Child/Student Mothers' Minding Space, Database for Student-Mothers, and Gender Sensitivity Training. In the needs assessment, it is found that 23 % of the student-mothers needed training on Gender and Development, followed by 20% of the student-mothers who wanted training on Safe Space Law, while 13 % of the student-mothers chose Cookery and Pastry Baking as the IGP they want to undergo. Moreover, it is shown the problems met and recommendation to avoid such problems of happening again.

Keywords**:** student-mothers, minding space, teenage pregnancy

9:30-9:40

401 – Examining Academic and Institutional Factors Influencing Licensure Performance of Selected Programs in the University of Southern Mindanao

Kharlo Subrio

ABSTRACT. X

Keywords: X

9:40-9:50

402 – Financial Analysis of Income Generating Projects (IGP) of Public High Education Institutions (HEIS) in Region XII

Charisse Quiambao

ABSTRACT. X

Keywords: X

9:50-10:00

403 – Compendium of Ethnoveterinary Therapies for Control of Internal Parasites in Livestock

Elizabeth C. Molina and Josephine Flores

ABSTRACT. Ethnoveterinary therapies are alternative remedies against internal parasitism in livestock. Production of a compendium on ethnoveterinary therapies for the control of internal parasites in livestock is being undertaken by the College of Veterinary Medicine from January 2023 to present. Secondary data from various studies conducted in the college on ethnoveterinary products that were tested against coccidia, helminths and trematodes of livestock were gathered, compiled and encoded. Initial lay-outing and editing of the compendium were done. A total of 23 ethnoveterinary preparations such as leaf, flower, fruit, stem and whole plant extracts, leaf powder extracts, crude extracts and oil extracts were included in the compendium. Moreover, capsulated and molasses-mineral-salt block dosage forms were contained in the compendium. Further, the dosage regimens of the ethnoveterinary products with anticoccidial, anthelmintic and antitrematodal effects in livestock were indicated in the compendium.

Keywords: anticoccidial, anthelmintic, antitrematodal, ethnoveterinary preparations, livestock

10:20-10:30

404 – MOM (Mothers on Move) Towards Building Assets Through Innovation Development of Fish Products

Ivy Mar Cabornida

ABSTRACT. The fish processing industry holds considerable potential for development through employment, income generation and nutrition from direct consumption as fish provides valuable animal protein requirement. Thus, the study aims to capacitate mothers through training on freshwater fish product development innovation strategies that would hopefully stimulate change to enhance productivity. The study has generally 3 phases: assessment of the fish processing and culinary experience by the mothers; development of quality processed fish products and fish dishes and finally to introduce to the mothers through training-workshop the developed fish products and fish dishes as "basket of options" for potential adaptation. Value-added fish products had also been developed. Among the these, fish balls, fish siomai, fish lumpia and fish nuggets were "like extremely" by the evaluators while fish chorizo and frozen marinated fish had "like very much" acceptability ratings. Moreover, the fish tocino and fish crackling needs more improvement as it only got a "like moderately" acceptability rating. These fish products developed were vacuum-packed and frozen for storability testing.

***Keywords*:** fresh water fishes/mothers/innovation/processing technology/fish products and dishes

10:30-10:40

405 - Gender in USM Extension Projects: Engagement , Oppoturnities and Entry Points

Marcos F. Monderin

ABSTRACT. Until recently, the idea of integrating research and extension activities into a single project has remained largely unexplored at the University of Southern Mindanao. Although there have been efforts to connect the two disciplines together, these two have remained separate and distinct. Thus, the need to establish a common understanding, expectations and language among research and extension activities paved the way to this proposal of integrating gender research into the extension initiatives of the institution. This project aims to assess the extent of engagement of beneficiaries in extension projects at the university and to deliver gender-sensitivity trainings to beneficiaries. Data will be gathered through Focus Group Discussions (FGD) and Key Informant Interviews (KII) To date, the proponents are in the process of crafting the questionnaire and interview schedule, which will be used to gather the data. Moreover, Information, Education and Communication (IEC) materials are likewise being prepared for utilization during the trainings.

***Keywords*:** Gender, narratives, capability building, engagement, gender sensitivity

10:40-10:50

406 – I-CARES: Islamic Relief's COVID19 Adaptation and Recovery through Economic and Social Protection and Support project

Esmaira Gunsayan

ABSTRACT. X

***Keywords*:** vX

11:10-11:20

407 - Pagpalain Bangsamoro: Unveiling the history and Struggles of primary actors towards peaceful Bangsamoro governmen

Saima Andil

ABSTRACT. Due to the unforeseen problems encountered by the researchers, the conduct of research interviews with the target participants is still ongoing from July 12-14, 2023 in Cotabato City, BARMM. Therefore, there are no data will be discussed in this narrative report but the researchers will assure that there will be a processed data during the presentation of this year's midyear in-house review.

Keywords**:** Bangsamoro, Government, History, Peace, Primary actors

11:20-11:30

408 – Development of Contextualized Instructional Materials in Teduray

Girlie D. Batapa, Ashley Coleen Ortiz, & Hazel Ann S. Soriano

ABSTRACT. x

Keywords**: x**

11:30-11:40

409 - Commercialization of Chevon Food Products and Standardization of Processing Center

Jalaloden Marohom

ABSTRACT. x

Keywords**: x**

1:00-1:10

410 – Transferring and Advancing Learning materials for Knowledge: Using of IECs for Archiving and Information Disseminating (TALK:AID)

Charlotte Adrea D. Tutor, Allan C. Facurib, & Janice M. Bangoy

ABSTRACT. x

Keywords: x

1:10-1:20

411 – Use of ICT in Facilitating Independent Learning and Teaching in the New Normal

Benedict D. Entera & Astrofil Hyde M. Alcala

ABSTRACT. In the "new" normal, education was forced to digitize and technologize. Therefore, many institutions are making greater use of technology, especially ICT, in the learning and teaching of students. To help teachers and parents in utilizing technology in teaching students, this extension program aims to capacitate teachers and parents on the use of information and communications technology to facilitate teaching and learning. Training considered for teachers and parents include utilizing educational mobile apps, how to build a simple mobile learning app, creating multimedia content and presentation, and using ICT tools to store and retrieve learning and teachings materials.

Keywords: ICT, New Normal, Teaching/Learning, ICTECKS, Mobile app

1:20-1:30

412 - Development of E-learning Modules for Certificate Courses in Halal Science

Jalaloden Marohom, Francisco Gil N. Garcia, Jurhamid C. Imlan and Josephine R. Migalbin

ABSTRACT. The proposed project aims to develop electronic learning modules for a certificate course in the halal science curriculum. The objectives include assessing the learning modules, developing e-learning modules, and creating a Virtual Learning Environment on Halal Science (VLE-HS) for the accessibility of these modules. The project follows a methodology that involves module assessment, the development of e-learning modules, the capacity building of module developers, and the development of the VLE-HS. The project proponents have completed the intended activities by seeking alternative means and holding meetings to review and plan future activities. The project commenced with a meeting to discuss and review the modules for the Halal Science Curriculum, followed by a seminar-workshop to enhance learning materials and prepare for the conversion of modules into electronic format. The modules underwent evaluation, and improvements were made based on feedback. The next planned activities include external evaluation, submission of storyboard layouts, and the digitalization of modules to make them available online. Animation will be incorporated into the e-learning modules, and the content will be presented in an animated format. The project aims to enhance understanding and education in halal studies, meet the demand for qualified personnel in the halal industry, and provide wider access to the halal science curriculum through e-learning. The Virtual Learning Environment on Halal Science (VLE-HS) will be developed with the invitation of an IT expert. The e-learning modules will be uploaded, and developers should ensure the appropriateness and friendliness of the system for use. This may ease the need for clients to join the certificate course without worrying about travel. It can cater to clients online and on-site. The uploaded e-learning modules in the completed online portal will be pre-tested before full implementation.

Keywords: Halal Science Curriculum, Electronic Learning Module, Certificate Course, Halal Studies. Halal education

1:50-2:00

413 – Statistical Tool Selector(Stat Select): A Mobile App for Faculty, Students and Researchers

Anna Jean S. Garcia, Honey Vincent Valle, Daryl Mae Mamon, Leonard Paleta, Jupiter Pilongco, Roel Valenton, Jeaneth Licaros, Jonald Pimentel, Philip Benjamin, Rowel Madio, Leorence Tandog, & Debbie Marie Verzosa

ABSTRACT. Selection of statistical method is crucial, and it depends on different situations such as the objectives of the research study, types of data, and the assumptions of statistical methodology. This research project will create a free mobile app that is readily available for the students and researchers of the university to help them select the appropriate statistical method for their study and data analysis. During the first two quarters, the researchers read literatures, brainstormed, discussed the commonly used statistical techniques in undergraduate and graduate student theses. Based on this information, the researchers created a comprehensive framework that organized the most commonly used statistical techniques as well as some more advanced statistical tools into a coherent framework that will be input in the app. The team has also started working on the app prototype. During the next two quarters, the app together with tutorial materials will be developed and finalized, and training of selected USM faculty will be conducted.

Keywords: Statistical Techniques, Descriptive Statistics, Test of Difference, Test of Relationship, Hypothesis Testing, Sample Determination

2:00-2:10

414 – Development of Arduino Microcontroller-based Lee's Disc Apparatus

Benedict Entera & Amancio II S. Manceras

ABSTRACT. The simple Lee's Disc Method is a common method of determining the thermal conductivity of solid materials used for insulation. The working principle of the Lee's disc apparatus is to find the thermal conductivity of a solid material that is a poor conductor by heat transfer. Heat from a heat source is transferred through two brass discs with the thin sample of insulating material put in between. Steady-state temperatures of the two discs will be measured using glass thermometers, the rate of cooling will be determined, then thermal conductivity will be calculated. This study focuses on improving the accuracy of temperature measurements by using a more precise system. The system consists of a microcontroller-based Arduino Uno board, waterproof temperature sensors DS18B20, and a lcd display. The system will be programmed using the Arduino IDE to take temperature measurements at shorter intervals, saved on a file to be used for thermal conductivity measurements. As for the heat source, two types are considered: nozzle heater and an improvised heater from common appliance like electric iron.

Keywords: Arduino, temperature, sensor, Lee's disc method, heat source

2:10-2:20

415 – Design & Innovation of Fully Automatic Egg Incubator

Joel V. Misanes & Orlando Forro

ABSTRACT. This initiative is the collaborative effort of the faculty research tandem by the two technically oriented people in the field of Industrial Technology. The project is called Fully Automatic Egg Incubator since it has a feature of a temperature control, Humidity control, Self-detect blower operation for the ventilation and automatic turning. Dual source or a hybrid type of power source will be employed in the innovation of this machine so that it will reduce the energy consumption to the whole operation. It will utilize the conventional electricity source plus the renewable energy in aid of solar panel.

Keywords**:** Egg Incubation, Fully Automatic, Hybrid, Temperature, Humidity

2:40-2:50

416 – Community-Based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Kagikit for Certification

Analyn A. Gonzales

ABSTRACT. The College of Business, Development Economics and Management through its extension and community services is guided by its mission for community development through advocacy, technology transfer, consultancy and other support services. Through the help of the CBDEM extension project of USM, the Community-Based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Kagikit for Certification, the Kayaga Women's Organization produced chicken kagikit product for commercialization. The college believed that it has the economic advantage that will help both Maguindanaon and non-Maguindanaon entrepreneurs, investors, and advocates. The college conducted needs assessment and profiling of 25 beneficiaries, signed Memorandum of Agreement between Barangay Kayaga and USM-CBDEM, capacitated the partner community through technical training, and produced financial management training module. Through the help of the college, the Kayaga Women's Organization (KWO) has been granted the certification as legitimate workers' association by the Department of Labor and Employment (DOLE). Moreover, the AgriBusiness Department spearheaded the product testing using the sensory evaluation criteria such as appearance, aroma, taste and texture, the research instrument employed a 9-point rating scale with 1 as the lowest and 9 as the highest. Overall, the general acceptability of the product was evaluated as "Like Extremely" by 115 respondents.

Keywords: Development, economic, management, promotion, financial

2:50-3:00

417 - Production, Processing and Positioning (3Ps) coco-based Products for Collaborative Barangay-Based Development and Economic Mainstreaming (3Ps CBDEM)

Jay-R G. Vildac, Lian D. Bagonoc, Jeannie U. Duka, Aileen Mitzi M. Alba, & Rodelyn A. Cariaga

ABSTRACT. Coconut products have gained significant recognition globally for their versatility, nutritional value, and sustainability. Cooperative enterprises play a vital role in the

coconut industry, contributing to the socio-economic development of community. This study aims to capacitate the partner-community on the production, processing, and positioning strategies of coco-based products through seminars, workshop and demonstration, with a specific focus on collaborative mainstreaming efforts within cooperative and the college. The component leaders attended the USM-ESO Project Inception Meeting on February 07, 2023, followed by the inception meeting of the college and the cooperative on March 09, 2023. Inception Meeting is considered as the initial planning stage of the project, the objective of this meeting is to bring together the beneficiaries and implementers of the project to present, discuss and agree on the direction of the project before it commence. During the Focus Group Discussion (FGD), it was agreed by the partner-community that they are willing to be capacitated on the production, processing and positioning of (a) virgin coconut oil, (b) coconut sap sugar, (c) coconut flour, and (d) young coconut water. The orientation to the community and meeting with the core group was made possible by the active participation of 15 members of the Dagupan Agrarian Reform Beneficiaries-Multi-Purpose Cooperative (DARB-MPC) and faculty extension implementers. On May 03, 2023 the beneficiaries were capacitated on coconut food-based product processing with the training experts from Philippine Coconut Authority (PCA).

Keywords**:** Collaboration, development, economic, management, product

3:00-3:10

418 - New Formulation of BAR and Liquid Soap From Selected Industrial Crops with Potential Anti-MIcrobial Activity

Abubakar A. Murray, Sedra Murray & Lorelyn Joy Turnos-Milagrosa

ABSTRACT. x

Keywords**: x**

3:20-3:40

419 - Maguindanaon Delicacies: Packaging, Labeling, Marketing and Profitability Toward Commercialization

Roy Gacus

ABSTRACT. xhis project focusses on the identification of packaging materials for selected Maguindanaon delicacies, particularly Kagikit and Dudol. The project intends to improve the packaging and labeling techniques of these delicacies to align with Maguindanaon culture, enhance marketability, and preserve their cultural significance. The project team determines possible options for packaging for Kagikit and Dudol, such as retortable pouches, glass bottles/jars, vacuum pouches, and pastry boxes, through an in-depth review of the literature, collaborative brainstorming meetings, and experimentation. Pre-testing on the shelf-life of the delicacies is another part of the research project, as is examining the effectiveness of alternative packaging materials and storage situations. Furthermore, an improved labeling design is created, considering pertinent information, regulatory requirements, and cultural representation. This project's successes promote the preservation and marketing of Maguindanaon delicacies.

***Keywords*:** Dudol, kagikit, labeling, Maguindanaon delicacies, packaging, shelf-life

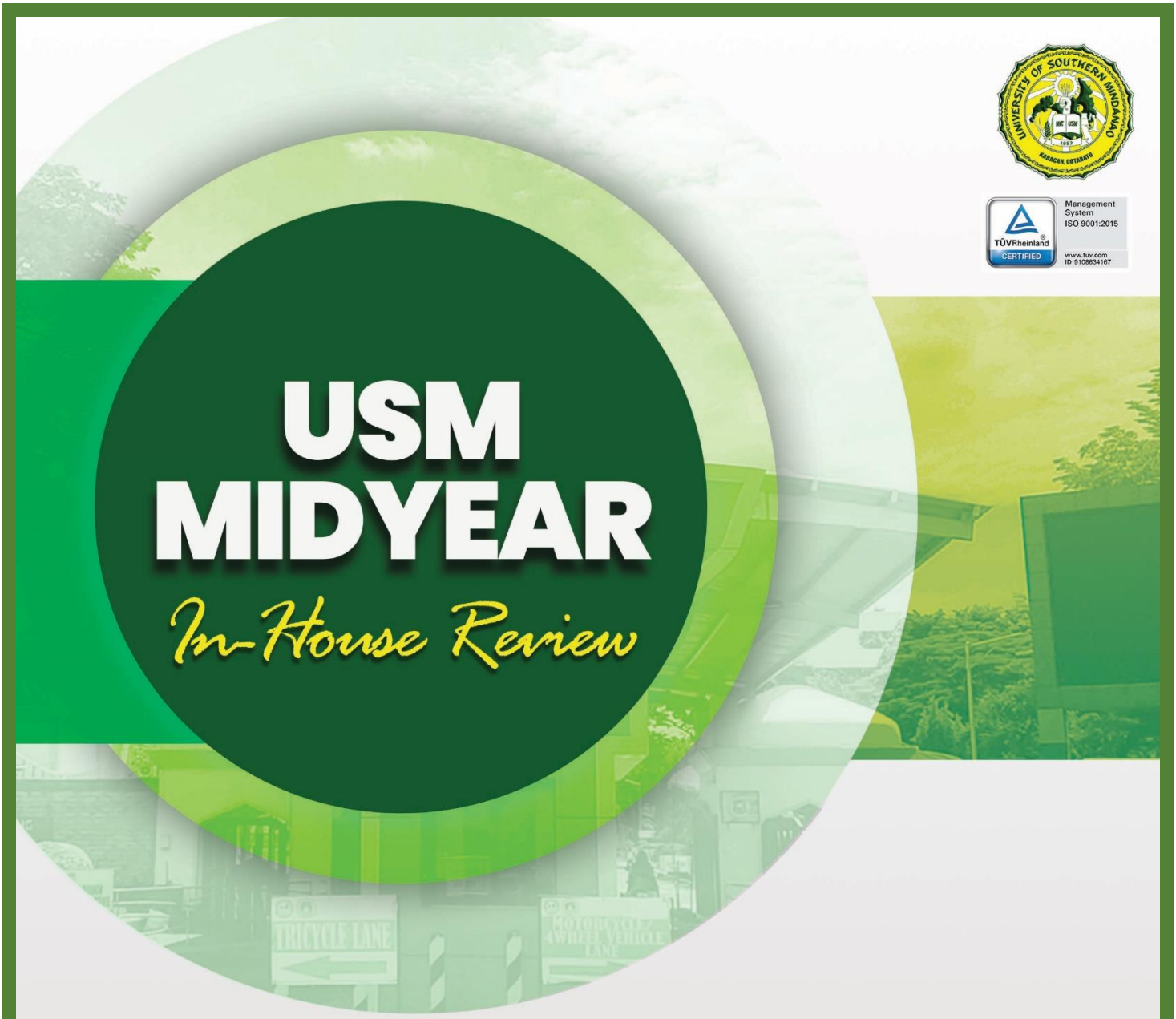
3:40-3:50

420 - Product Development and Innovation of Calamansi Infused Bevegraes for Refrehsing Blends USMARC

Sandra Joy Pahm

ABSTRACT. The Philippine lime or calamondin is locally known as calamansi (Citrofortunella microcarpa) and an indigenous plant of the Philippines. Currently, there is an increasing importance of calamansi due to its expanded uses and new market in the processed food, cosmetics and household products industry. In the beverage industry, consumers are opting for an alternative to the sugar-laden commercial products that are available in the market since consumers are getting conscious of what they consume. While in the locality of Kabacan Cotabato, calamansi based beverages available in the market are all produced in the other provinces. Technology for processing juice is very well known to all, but innovations and improvements of the different calamansi blends still has a lot of work. Thus, this study aims to establish a calamansi orchard in the University for production and processing, and to develop different blends of calamansi juice infused with turmeric that can be acceptable for market.

***Keywords*:** calamansi, juice, blends, orchard, processing



USM MIDYEAR

In-House Review

Theme:
Excellence in USM RDE towards societal impact

2023

July 20, 2023

This serves as an invitation

rpso@usm.edu.ph www.usm.edu.ph/rde

MIDYEAR IN-HOUSE REVIEW PROGRAM 2023

GENERAL SCHEDULE OF ACTIVITIES

July 20, 2022 (Thursday)

TI ME	ACTIVITY
7:30 AM – 8:30 AM	Registration
8:30 AM – 9:15 AM	Opening Program
9:30 AM – 12:00 PM	Presentations
12:00 PM – 1:00 PM	Lunch Break
1:00 PM – 4:10 PM	Presentations
4:10 PM – 4:20 PM	Break
4: 20 PM – 4:40 PM	Closing Program

Opening Program

Commercial Building
July 20, 2023
8:30 AM

Invocation	**Dr. Tamie C. Solpot** **Dr. Abubakar A. Murray**
National Anthem	**In-Video**
Cotabato Hymn	**In-Video**
Kabacan Hymn	**In-Video**
Welcome Remarks	**Dr. Ma. Teodora N. Cabasan** Vice President for RD&E
Message of the President	**Dr. Francisco Gil N. Garcia** SUC President IV
Rationale	**Prof. Lydia C. Pascual** Director, RDO
Presentation of Evaluators	**Dr. Mary Joy Cañolas** Director, Extension Services Office Over-all Coordinator, Midyear In-house Review

EMCEE : Maria Angelika T. Balungay

EVALUATORS

Session I

Basic Research

Engr. Willie Jones B. Saliling

Dr. Naomi G. Tangonan

Dr. Krizler C. Tanalgo

Session II

Applied Research

Dr. Edward A. Barlaan

Assoc. Prof. Bryan Lloyd P. Bretaña

Dr. Khris June L. Callano

Session III

Extension

Dr. Josephine L. Arbes

Dr. Ardniel A. Baladjay

Dr. Josephine R. Migalbin

Session IV

Social Research, Extension, Product Development

Dr. Astrofil Hyde M. Alcala

Dr. Romiel John P. Basan

Dr. Elizabeth C. Molina

Dr. Apple R. Ureta

MODERATORS

Session I

Basic Research

AM - Leanne Jay M. Tejero (CSM)
AM -Nor-ain M. Corpuz (CEIT)

PM -Marlene E. Ofrecio (ISPEAR)
PM -Norquez M. Mangindra (CED)

Session II

Applied Research

AM - Rene C. Cabahug, Jr. (CTI)
AM -Gary D. Lasaga (CVM)

PM - Florey Mae Pascua (CEIT)
PM -Samson L. Rapuza (CTI)

Session III

Extension

AM -Estella B. Barbosa (CASS)
AM -Rowell N. Nitafan (CASS)

PM -Saima M. Andil (IMEAS)
PM -Alina S. Arancel (CHS)

Session IV

Social Research and Extension & Product Development

AM -AP Warren P. Adamat (CVM)
AM -Saque J. Amilbahar (CEIT)

PM -Ellen Joy M. Farala (CED)
PM -Karizza Jane B. Pejaner (P-PALMA)

Closing Program

Commercial Building
July 20, 2023
4:20 PM

SYNTHESIS PRESENTATION	
SESSION 1	**MS. MARRY GRACE S. BALBUENA** EPS I
SESSION 2	**MS. HELEN MACAILING**
SESSION 3	**CHARLOTTE ANDREA TUTOR** EPS II
SESSION 4	**ENGR. KHARLO J. SUBRIO** EPS II
PRESENTATION OF OUTPUT FOR USMARD CENTER RESEARCH	**DR. EFREN E. MAGULAMA** Director, USMARD Center
PRESENTATION OF OUTPUT FOR EXTENSION	**DR. MARY JOY S. CAÑOLAS** Director, Extension Services
PRESENTATION OF OUTPUT FOR COLLEGE-BASED RESEARCH	**PROF. LYDIA C. PASCUAL** Director, Research and Development
PRESENTATION OF OUTPUT FOR PICRI RESEARCH	**DR. ABUBAKAR A. MURRAY** Director, PICRI
PRESENTATION OF RDE OUTPUTS	**DR. MA. TEODORA N. CABASAN** Vice President, RDE
ACCEPTANCE OF RDE OUTPUTS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
CLOSING MESSAGE	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
CLOSING PRAYER	**DR. TAMIE C. SOLPOT** Faculty Researcher

***EMCEE*:** Sofia Loren Bonete

USM YEAR-END 42nd In-House Review

Proceedings

Theme:

Advancing Research and Innovations Towards Sustainable Development

December 1 - 2, 2022
University of Southern Mindanao
Kabacan, Cotabato

www.usm.edu.ph/rde
rpso@usm.edu.ph

Contents

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No.: (064)572-2138
Email address:op@usm.edu.ph

OFFICE OF THE PRESIDENT

Message

My deepest appreciation to everyone participating in your Agency Research, Development and Extension In-House Review. As we are about to end the year, we need to evaluate our RDE projects in the university to achieve favorable outcomes.

We are grateful for the support given by our stakeholders and partner agencies as we engage in research innovations towards sustainable development. The road might be tough but as we join hands and share with each other our expertise, we can surely bridge the gaps.

Let's continue to seek knowledge, technologies, and innovations to meet the demands of this generation creating more opportunities for everyone. May God bless the USM RDE family.

FRANCISCO GIL N. GARCIA, PhD
SUC President IV

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Email address:usmvprde@usm.edu.ph

VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

Message

It is my great pleasure to welcome all the participants to the 2022 Year-End RDE In-House Review.

This event is an opportunity for our faculty members and researchers to share their accomplishments, findings, and innovations in research, development and extension (RDE) projects. This scholarly event also provides us an opportunity to review our performance in RDE and identify our opportunities for improvement. We work together in USM to the achievement of the 'Sustainable Development Goals' through Advances in our Research and Innovations. We had strategically structured our RDE agenda and aligned our RDE projects into it to be relevant and competitive, and we aim to generate technologies to be transferred it to the community for sustainable development. Our investment, efforts and time spent in RDE plays a significant role in the economic growth and prosperity of our region and country. Let us continue to deepen our knowledge to develop breakthrough sustainable innovations.

In this scholarly occasion, I congratulate our researchers and extensionists for their contributions in advancing research and innovation in the University of Southern Mindanao. I also give thanks to the cohesive efforts of the working committee for organizing this 2022 Year-End In-House Review.

MA. TEODORA N. CABASAN, PhD
VP for Research, Development and Extension

RATIONALE

This Research Development & Extension (RDE) Agency In-House Review is an annual/yearly activity of the University. The main objective is to review and evaluate all on-going and completed Research Development and Extension Programs/Projects/ Studies. This serves as avenue for all researchers, extension workers and other stakeholders to convene and exchange new knowledge or products generated and development/extension strategies relevant to the University's vision, mission, and objectives. It is also through this activity that investments in RDE can be appraised thoroughly to ensure that RDE activities are geared toward addressing the needs and problems of the clientele of the university in its service area, in particular, and in the national level in general, for sustained agricultural development and its allied fields. Expectedly, very active interactions will form part of the highlights.

OBJECTIVES

To evaluate completed and on-going RDE projects/activities particularly with regard to the attainment of objectives and adherence to the approved programs;

To identify problems met during the implementation and recommend specific courses of action, i.e. continuation, extension, modification of planned activities and methodology, suspension, termination, etc., in compliance with the recommendations of the evaluating panel;

To identify technologies generated for field testing, verification, and piloting before its final dissemination/promotion and commercialization;

To identify mature technologies ready for packaging and dissemination;

To identify significant results for policy formulation and development;

To identify new researchable areas; and

7. To record and monitor both in-house and externally funded researches.

YEAR-END IN-HOUSE REVIEW PROGRAM 2022

GENERAL SCHEDULE OF ACTIVITIES

DAY 1: December 1, 2022 (Thursday)

TI ME	ACTIVITY
8:30 AM – 9:00 AM	Registration
9:00 AM – 10:00 AM	Opening Program
10:00 AM – 10:10 AM	Break
10:10 AM – 11:30 AM	Presentations
11:30 AM – 12:00 NN	Poster Viewing
12:00 NN – 1:00 PM	Lunch Break
1:00 PM – 2:40 PM	Presentations
2:40 – 3:00 PM	Break
3:00 – 4:20 PM	Presentations
4:20 – 5:00 PM	Tabulation of Scores

DAY 2: December 2, 2022 (Friday)

TIME	ACTIVITY
8:40 – 10:00 AM	Presentations
10:00 – 10:20 AM	Break
10:20 – 12:00 NN	Presentations
12:00 – 1:30 PM	Lunch Break
1:30 PM – 3:00 PM	Closing Program

Opening Program

Commercial Building
December 1, 2022
9:00 AM

Invocation	AVP
National Anthem	AVP
Welcome Remarks	Dr. Ma. Teodora N. Cabasan Vice President for RD&E
Message of the President	Dr. Francisco Gil N. Garcia SUC President IV
Rationale	Dr. Lydia C. Pascual Director, RDO Over-all Coordinator, In-House Review
Presentation of Evaluators	Dr. Mary Joy Cañolas Director, Extension Services Office

Emcee : Ashley Coleen Ortiz

EVALUATORS

Session I
Basic Research
Dr. Onofre S. Corpuz
Dr. Elizabeth D. Malacad
Dr. Naomi G. Tangonan

Session II
Applied Research
Dr. Emmanuel P. Leaño
Dr. Harris M. Sinolinding
Dr. Lorna P. Vilbar

Session III
Development and Social Research
Dr. Mervin G. Gascon
Dr. Ariel Roy L. Reyes
Dr. Lorna G. Valdez

Session IV - Extension
Mr. Ommal H. Abdulkadil
Dr. Marcelina O. Bahalla
Dr. Moveta P. Balala

MODERATORS

Session I - Basic Research
Day 1 (December 1, 2022)
AM - Renee Jane A. Ele
PM - Joeseph S. Quisado

Day 2 (December 2, 2022)
AM – Marlyn Resurreccion
Amancio S. Manceras II

Session II - Applied Research
Day 1 (December 1, 2022)
AM – Courtney Love Donque
PM – Kathleen Ivy Bolotaolo

Day 2 (December 2, 2022)
AM – Rene Cabahug
– Maria Angelika T. Balungay

Session III - Development and Social Research
Day 1 (December 1, 2022)
AM – Rowell Nitafan
PM – Phoebe Mae Baure

Day 2 (December 2, 2022)
AM – Gideon S. Sumayo
– Karizza Jane Pejaner

Session IV - Extension
Day 1 (December 1, 2022)
AM - Florie Jane Tamon
PM – Saque Amilbahar

Day 2 (December 2, 2022)
AM – Esperanza D. Lucena, Jr.
– JP E. Fortinez

SCHEDULE OF PRESENTATIONS

Note: 20 minutes per presenter (8 minutes presentation + 12 minutes Q&A)

Legend: Programs/projects highlighted in green are competing projects.

Day 1					
Start	**End**	**Basic Research (Science)**	**Applied Research (Science)**	**Development and Social Research**	**Extension**
10:10	10:30	101 - Mark Al-Jamie J. Muttulani - Germplasm Collection, Propagation And Fertilization Of Anthurium In USMARDC	201 - Adeflor G. Garcia - Project 3. Developing Rapid and Affordale Soil Nutrient Test Fretilizer Formulation for Rubber Cropping System	301 - Glyn G. Magbanua - Research Into Practice: Practical Applications of English for Specific Purposes (ESP) in the Workplace	401 - Pia Amabelle Flores - USM LIFER Project (Components 2 and 6): USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products
10:30	10:50	102 - Lorelyn Joy Turnos-Milagrosa - Organic-Based Interventions for Selected Crops and Sheep Nutrition	202 - Lydia Pascual - Potential Anti-Cancer leads from plants in Region XII Proj. Screening of Plants	302 - Riceli C. Mendoza - University of Southern Mindanao Graduate Tracer Study: Input for Institutional Quality Assurance	402 - Tamie C. Solpot - CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate COVID-19 Effects
1:50	11:10	103 - Frederick John Navarro - Nutrient Retention During Commercial Production of HVC-USM Food Products	203 - Pia Amabelle Flores - USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products	303 - Jacinta T. Pueyo - Intersectionalizing K-12 Graduates' Competencies: a Baseline for Tertiary Instruction, and Materials Development	403 - Maricel G. Dayaday - SWIPE-Solid Waste and Integrating Program for E-Waste Disposal
11:10	11:30	104 - Joseph O. Castillo - Project 1. Effective Rubber-based Cropping System in Southern Philippines	204 - Edward a. Barlaan - Project Title: Banana Health Diagnostics: Molecular Surveillance of Major Disease Causal Pathogens of Banana in Region 11 and 12	304 - Arjay S. Agbunag - Design and Development of Online Pre-registration System for University of Southern Mindanao	404 - Ardniel A. Baladjay - Tablea: Pangkabuhayan para sa Kotabateñong Pamayanan A Community-based Tablea Production for Sustainable Livelihood in Cotabato

11:30	12:00	**Poster Viewing**			
12:00	1:00	**BREAK**			
1:00	1:20	105 - Purificacion O. Cahatian - Project 4. Development of Cost and Effective Pest and Disease Management of Rubber and Intercrops		305 - Ryan Z. Gonzaga - Development and Implementation of Online Application for Graduation and Final Clearance System	405 - Gelyn V. Amilbahar - Development of Video Materials on Organic Production of Indigenous Vegetables for Dissemination
1:20	1:40	106 - Adeflor Garcia - Land suitability analysis for rubber crops in Agusan del Sur	206 - Edward A. Barlaan - Validation of Molecular Markers for Identification of Cacao HYVs, Criollo Types and Disease Resistant Varieties through Marker-Assisted Breeding	306 - Pia Amabelle M. Flores - Project Title: Usm IP-TBM Phase II: Patent Mining of Rubber Technologies Thru Intellectual Property and Technology Business Management (IP-TBM) Operations of the University of Southern Mindanao	406 - Glyn G. Magbanua - Gender Research and Capability Building in Extension Projects: Exploring Engagement, Opportunities and Entry Points
1:40	2:00	107 - Mel Chrisel A. Sales - Verification of Soil pH, OM, N, P, and K Test Methods	207 - Jessie G. Elarde - Technology Development for Corn Silage Production and Its Utilization	307 - Pia Amabelle M. Flores - Project Title: DOST PCAARRD and USM Agri-aqua Technology Business Incubator (USM-ATBI)	407 - Analyn A. Gonzales - Community-based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Kagikit for Certification
2:00	2:20	108 - Anthony S. Agravante - Cultural Management of Stingless Bees for Sustainable Honey Production	208 - Edward A. Barlaan - NICER Project 1 - Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Profitability	308 - April Rose T. Butalid - Integrating Gender and Development (GAD) Concepts Across Mandated Language, Literature, and Social Science Courses	408 - Meldred F. Samblaceno - Development of Community Based Tourism in Kabacan, Cotabato
2:20	2:40	109 - Tamie C. Solpot - Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber	209 - Gwen Iris D. Empleo - NICER Project 2 - Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement	309 - Eugene G. Ranjo - PPMP Automation for Productivity Improvement of e-Admin Services	409 - Leorence C. Tandog - Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS Plans) (Phase 2: Facilitating Independent Learning and Teaching in the New Normal)

2:40	3:00	**BREAK**			
3:00	3:20	110 - Jurhamid C. Imlan - Development and Acceptability of Mutton-Based Food Products for Emergencies	210 - Renel M. Alucilja - NICER Project 3 - Development of Optimized Post-Harvest Processing Approaches for Improved Quality of Cacao Beans	310 - Anita Sornito - Sustainable Green Library of USM, Kabacan	410 - Radji A. Macatabon - "Inpograp Ng Mga Inpormasyon Hinggil sa Omicron Variant Para Maiwasan ang Pagkalat ng COVID-19 at ang Benepisyo ng Pagbabakuna: Isang Teknikal na Pagsasalin"
3:20	3:40	111 - Rezin G. Cabantug - Development of a Commercial Grade Organic Planting Media Using Biochar as the Man Raw Materials	211 - Maria Elena N. Tanabe - Microbial diversity of Liguasan Marsh and their potential biotechnological applications in green energy, fisheries, sustainable agriculture and animal production, and human health	311 - Harem R. Roca - Upgrading of Cacao Post-Harvest Processing Center Facilities of USM	411 - Ellen Joy M. Farala - Strengthening Functional Literacy through Interactive Video Lessons (IVL) in Barangay Cuyapon, Kabacan, Cotabato
3:40	4:00	112 - Abubakar a. Murray - Perpetuation and Production of Red Ginger (*Zingiber Officinale* Rovb. Var. r*ubra*), Black Turmeric (*Curcuma caesia*) and Makabuhay (*Tinospora rumphii* Boerl) as Promising Raw Materials for Product Development	212 - Maria Elena M. Neyra-Tanabe - University of Southern Mindanao-Treelife Coco Sugar Research and Development	312 - Mark Al-Jamie J. Muttulani - Upgrading of Tissue Cultures Facility in University of Southern Mindanao	412 - JP E. Fortinez - CTI Capacity Building for Barangay Pisan: Pinning Intellectual Skills and New-Tech (PISan)
4:00	4:20			313 - Sandra Joy P. Pahm - Upgrading of High Value Crops Food Processing Laboratory at University of Southern Mindanao	
4:40	5:00	***Tabulation of Scores***			

Day 2					
Start	**End**	**Basic Research (Science)**	**Applied Research (Science)**	**Development and Social Research**	**Extension**
8:40	9:00	113 - Jasmin Pecho - Potential Use of Bca, Bio-stimulants and Water Management on Diseases of Dragon Fruit	213 - Leila Moscoso - Production, Commercialization & Technology Transfer of Kuliva Ice Cream	314 - Nenita E. Olero - Establishment and Conservation of Indigenous Tropical Fruit Crops in the University of Southern Mindanao	413 - Cheeze R. Janito - "Laro Mo, Sagot Ko": A Sports Management Skill Development Project
9:00	9:20	114 - Efren E. Magulama - Trait Enhancement of USM Varieties and Family Selections With Herbicide and Corn Borer Resistance	214 - Julius Jerome G. Ele - Development of Rice Topping Product – "kagikit" - From Chicken Meat	315 - Sheena Lucena - Establishment of Mango and Banana Germplasm for Conservation, Characterization, and Utilization	414 - Marlene Ofrecio - Kabataan Kontra Droga at Terorismo: Sports Development Project Phase 1: Skills Acquisition and Development
9:20	9:40	115 - Baser L. Mamalac - Project: Use of Triple Crop System in Enhancing Resource Use Efficiency and Crop Productivity in Corn	215 - Ivy Mar Cabornida - Processing and Packaging of Chevon Products	316 - Francisco Gil N. Garcia - University of Southern Mindanao Futures Thinking for Food Security, Systems, Innovatons and Sustainability	415 - Cherie Cano- Mangaoang BIO-NIHAN PARA SA KALIKASAN: Promoting Holistic Biodiversity Conservation Through Community Partnership
9:40	10:00	116 - Lothy F. Casim - Prevalence and Molecular Characterization of Gastrointestinal Parasites in Human-macaque Interface: the Case of Handling Leyte and New Israel, Makilala, North Cotabato	216 - Pia Amabelle Flores - Development of Diversified Products and Smart Packaging for Tinahito Brand of Smoked Catfish (*Clarias gariepinus*)	317 - Abubakar Murray - Organizational Interventions on Halal Certification Systems Towards Product Internationalization	416 - Leonila V. Papalid - Diffusion and Adoption of "Tilakas" Technology
10:00	10:20	**BREAK**			
10:20	10:40	117 - Florence Roy P. Salvaña - Assessment of Wildlife Encounters, Rescue and Trading in Protected Biodiversity Landscapes of North Cotabato	217 - Joseph O. Castillo - Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables	318 - Dyane Rhea Bana-ay - Development of e-LET Intervention Program for Professional Education	417 - Mary Rodelyn a. Cariaga - Project 6. Capability Building of Rubber Stakeholders and Role of Women and their Children Natural Rubber Industry in Agusan del Sur and North Cotabato

10:40	11:00	118 - Joan Sadoral - PROJECT 4. Disease Profile in Rubber-based Farming System in Southern Philippines	218 - Nenita Olero - National Cooperative test for Rice at USM	319 - Marianne I. Meriales - Needs Assessment, Gap Analysis and Intervention Mapping: Streamlining Nursing Program's Implementation Outcomes	418 - Mary Rodelyn A. Cariaga - Juan Food: Enabling Rural Families Through Home and Community Garden in Support for Household Livelihood in Barangay Dagupan
11:00	11:20	119 - Jeannie U. Duka - CornLai: USM Agri-based Initiatives in Food production to Address Food Security During Pandemic Crisis	219 - Marilyn S. Painagan-Calub - Optimization of Irrigation Flow Through Conduit Microhydropower to Generate Electricity for Off-grid Barangay of Kabacan, Cotabato	319 - Elsa a. Gonzaga - USM Education 4.0: Building Adaptive Higher Education Through Technology in the New Normal	419 - Hasim K. Iskak - Islamic Knowledge Development and Enhancement of Livelihood Skills Among Bangsamoro
11:20	11:40	120 - Edward A. Barlaan - "MECO-TECO" Joint Research Project: Improvement of Carabao Mango Production and Fruit Quality through Quantitative Trait Loci (QTL) Identification for Scab and Stem-End Rot Resistance by Genome Wide Association Studies (GWAS)		320 - Moreno B. Java, Jr. - Efficiency of Various Physical Exercises, Dietary Intakes, and Health Conditions of USM Employees: Basis for Program Intervention and Development of Database Management System	420 - Francisco Gil N. Garcia - Consultancy for Agricultural Productivity Enhancement (CAPE2) program
11:40	12:00	121 - Edward A. Barlaan - Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scrab- and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genom-wide Association Studies (GWAS)		321 - Rowell P. Nitafan - Exploring Indigenous Narratives From the South: the Pe'ngang and the Role of Datu in the Conflict Resolution Among the Obo Manobo	421 - Janice M. Bangoy - Integrated Services for Enhanced Education (I-SEE): A Connectivity Resilience Project Amidst Covid-19 Pandemic
12:00	1:00	**BREAK**			
1:00	3:00	**AWARDING AND CLOSING PROGRAM**			

Abstracts

10:10-10:30

101 - Germplasm Collection, Propagation and Fertilization of Anthurium in USMARC

Mark Al-Jamie J. Muttulani and Lorelyn Joy Turnos-Milagrosa

ABSTRACT. The Philippine Ornamental Horticulture Industry has come a long way when cut flowers are considered its major component and the growers are hobbyists or plant enthusiasts. One of the important cut flowers of the country is the Flamingo Flower, which is popularly known as "Anthurium". This crop is commonly grown in cooler climatic condition mostly in the uplands, but there are some potential varieties which can also be grown in the lowlands. To enhance the growth and yield performance of anthurium under lowland condition, a study on enhancing propagation of anthurium was conducted at the University of Southern Mindanao , which will be added to the existing collection of ornamental crops in USMARDC. The study was composed of two separate trials which were laid in Randomized Complete Block Design with three replications. Study 1 evaluated different organic fertilizers (rice hull compost, goat manure, cow manure, chicken manure, vermicompost) and Study 2 covered different plant growth regulators (ANAA, Growmore, Hormex). Treatments were applied twice a month through localized placement application for organic manures and soaking/foliar application for PGR. In Study 1, anthurium plants applied with cattle manure significantly produced tallest plants while goat manure and vermicompost-treated anthuriums resulted with greater number of developed leaves. Plants applied with rice hull compost were observed to have the widest spathe and chicken manure application resulted in highest number of flowers produced. For Study 2, plants applied with Hormex + Growmore significantly produced the tallest plants, longest leaf length and pedicel, and most numbered flowers. The application of ANAA+Growmore and Hormex+ Growmore significantly resulted in longest and widest spathe. Results of the study revealed that among the organic fertilizers and PGRs evaluated, chicken manure and Hormex+Growmore generally resulted in better growth performance, most especially in terms of the flower production.

Keywords: Anthurium, Organic Fertilizers, Plant Growth Regulators, Propagation Technique

10:30-10:50

102 - Organic-Based Interventions for Selected Crops and Sheep Nutrition

Lorelyn Joy N. Turnos-Milagrosa, Baser L. Mamalac, Mark Al-Jamie J. Muttulani, Josephine R. Migalbin, and Tamie C. Solpot

ABSTRACT. Organic foods, as products from organic agriculture, could surely contribute to better health of the consumers through reduced exposure to synthetic farm inputs and increased nutritional quality. The organic research program was composed of five components: Fermented Fruit Juice (FFJ), Fermented Plant Juice (FPJ), Fish Amino Acid (FAA) and Oriental Herbal Nutrient (OHN) were tested in tomato (Component 1), chili pepper (Component 2) and string beans (Component 3); monitoring pests and diseases (Component 4), and raising of sheep in organic pasture with the supplementation of Salvinia grass (Component 5). The crops' experimental sites were laid in RCBD with seven treatments and

three replications, and were located at USMARDC field. There was an area at the University Goat Project, USM, which served as the pasture area for the experimental sheep. For tomato and chili pepper trials, studies revealed that application of FFJ and FPJ generally resulted with statistically comparable means with the commercial checks in terms of the number of fruits per plant and the final yield. Statistically comparable results were also attained by FFJ and OHN with the commercial checks for the string beans. Significant findings with lower disease infection/insect infestation were generally observed in concoction-treated plants. Both FAA and FPJ-treated tomato plants had lower fruitworm damage caused by *Helicoverpa* spp. and lower *Epilachna* sp. population, than the untreated plants and plants treated with commercial checks. OHN, FFJ and FPJ-treated chili pepper and string beans had consistently lower *Cercospora* frogeye leafspot and *Cercospora* leafspot than the checks. Above results and findings revealed significant potentials of the concoctions tested in terms of both crop productivity and pest and disease reduction. The project on organic sheep raising revealed that with or without *Salvinia molesta* in the diet of the experimental animals, their performance in terms of body weight gain, soilage and dry matter intake was the same.

Keywords: Anthurium, Organic Fertilizers, Plant Growth Regulators, Propagation Technique,

10:50-11:10

103 - Nutrient Retention During Commercial Production of HVC-USM Foods

Frederick John Navarro, Deinmark Antes and Bryan Lloyd P. Bretaña

ABSTRACT. Ginger (*Zingiber officinale*) and turmeric (*Curcuma longa*) rhizomes are raw materials for powdered food products in USM High-Value Crops Processing Center (USM-HVCPC). Black turmeric (*Curcuma caesia*) and langkawas (*Alpinia galanga*) are propagated in Philippine Industrial Crops Research Institute (PICRI) as potential materials for new food products. Plant and food samples were analyzed to determine the change in macronutrient, total phenolic compound (TPC), and antioxidant property change (AOC) during the food production. Proximate composition was analyzed using standard procedures, while the TPC and AOP were analyzed using UV-vis spectrophotometry. This study developed a method using reverse-phase high-performance liquid chromatography (RP-HPLC) to simultaneously identify the significant compounds in plants and food products. Moisture, ash, crude fat, and crude fiber of food products showed a significant ($p<0.05$) decrease compared to the rhizome samples. Carbohydrates significantly increased, while crude protein did not change. The TPC and AOP decreased by 56% and 5%, respectively. The half maximal inhibitory concentration (IC50) increased between 19-29 ug/mL during production. Initial screening for configurational change in compounds showed a red shift after heating the rhizomes of black turmeric and langkawas, which was confirmed using RP-HPLC with gradient elution and a photodiode array detector (PDA). This implies that food processing reduces the raw material's macronutrient, phenolic content, and antioxidant activity. The study further concludes that RP-HPLC-PDA with gradient elution can be a potential technique for identifying and authenticating Zingiberaceae (Ginger family) rhizome products.

***Keywords*:** Anti-oxidant activity, proximate composition, RP-HPLC, total phenolic content, Zingiberaceae

11:10-11:30

104 - Project 1. Effective Rubber-based Cropping System in Southern Philippines

Joseph Castillo, Adeflor G. Garcia, Leandreux D. Ocasion, Linda Buquir, Honey B. Goloran, Edsphil Gunsi, Johnrey Gallego & Crismark Bayawa

ABSTRACT. The study was established in December 2019 at the University of Southern Mindanao Agricultural Research and Development Center, Kabacan, North Cotabato to design, showcase and determine the viability of rubber-based cropping system for smallholder farmers. The main crop is rubber planted on double hedgerows (2.75 m x 4.5 x 16 m). The main plots represent the perennial intercropping system: Rubber + cacao, rubber + coffee, rubber + banana-cardava; and rubber + lanzones. The annual intercrops represent the subplot: corn, mungbean, cassava and eggplant. There were three crop cycles of corn and mungbean planted in year 1 (2020) and year 2 (2021) for all the rubber perennial mainplots. Cassava and eggplant annual intercrops have one crop cycle during 2020 and 2021. The grain yield of USM Var 10, green corn yield of sweet and glutinous corn was all comparable among the different perennial intercropping models. The mungbean yield for three crop cycles were also comparable among the perennial intercrops. Meanwhile, tuber yield of cassava and eggplant yield did not differ significantly among the Rubber-based cropping system (RBCS) models. Furthermore, the yield levels of the annual intercrops were higher than the national average of corn, mungbean, cassava and eggplant. At 25 months after planting (MAP), average rubber stem girth across cropping system ranges from 15.0 – 18.0 cm. Rubber + Banana Model projected 6 tons/ha bunch yield. The performance of annual intercrops is now under field evaluation for the year three (3) of the RBCS models.

Keywords: Agroforestry, Rubber-Based Cropping System, Food Security, Farming Livelihoods, Household Income

1:00-1:20

105 - Project 4. Development of Cost and Effective Pest and Disease management of Rubber and Intercrops

Purificacion O. Cahatian, Joan P. Sadoral and Merian Mae D. Paule

ABSTRACT. Pest profiling was done for rubber and its perennial and annual intercrops at the University of Southern Mindanao, Kabacan, Cotabato. For rubber and perennial intercrops (banana, lanzones, cacao, and coffee), all sample trees were assessed twice a month. Annual intercrops (corn, mungbean, eggplant, and cassava), were assessed weekly for the presence of pests following a "Z pattern". Assessment for rubber, banana, cacao, and coffee revealed that sucking insects (order: Hemiptera) such as scale insects and mealybugs were the most prevalent insect pests infesting these perennials. On the other hand, an arachnid specie (mites) was observed devastating lanzones trees in the area. Low rainfall prevails some of the insect pests to increase their incidences. Major and minor insect pest species of each annual intercrops were also identified and recorded. Results showed that ESFB was the most dominant insect pests infesting eggplant, while black bean aphid was the most dominant infesting mungbean from vegetative up until the maturity stage, respectively. On the other hand, corn planthopper started

devastating corn from seedling up until the maturity stage. For our management, two botanical extracts were found to have promising results in terms of managing the population of ESFB, aphids, and as well as the yield of eggplant wherein number of fruits with borer, population count of borer, and weight of fruits with borer, had significantly lower results compared to the untreated control. Moreover, one botanical extract showed potential for controlling twig borer since it is comparable with the Synthetic Insecticide. Finally, for the management of Fall Armyworm, 10 grams of ash applied as powder had a promising result, but phytotoxicity effect was observed in treatments where ash was diluted in water.

Keywords**:** Botanical extracts, Crop diversification, Pest management, Pest Profile of Rubber-based Farming System, Wood Ash

1:20-1:40

106 – Land suitability analysis for rubber crops in Agusan del Sur

Adeflor G. Garcia, Johnvie B. Goloran, Leandreux D. Occasion & Spencer John P. Eborde

ABSTRACT. Rubber-based systems sequester soil organic carbon through the accumulation of leaf litter fall. Generally, higher elevations accumulate SOC due to lower microbial decomposition as a result of decreasing temperature with increasing altitude. The study was conducted to determine the amount of SOC sequestration and soil physicochemical properties in rubber-based system at various elevations in Cotabato (North). This was carried-out in areas with elevations ranging from 63 to 1171 masl. Samples were submitted and analyzed at Griffith University, Australia. Results were analysed through multiple linear regression analysis to determine the trend of soil organic carbon with elevation and some soil physicochemical properties. RCBD analysis was also use to differentiate the level of significance of some soil physicochemical properties. Higher SOC (4.35%), sequestered SOC (83.03 t/ha), SOM (7.49%) and total nitrogen (0.42%) were observed in high elevation (1171 masl) (Mimbalawag, Alamada). Meanwhile, lower SOC (1.11%), sequestered SOC (26.61 t/ha), SOM (1.90%) and total nitrogen (0.11%) were obtained in the lowest elevation9 USM Pasig, Kabacan). Based on the analysis, SOC, SOM and soil total N increases with increasing elevation. However, elevation did not influence soil pH, soil EC, total P, total K, bulk density, porosity and void ratio. The results imply that rubber plantations in higher elevations have higher SOC stocks compared with plantations in lower elevations.

Keywords**:** Elevation, Physicochemical, Regression, Rubber-based system, Sequestration, SOC

1:40-2:00

107 - Verification of Soil pH, OM, N, P, and K Test Methods

Mel Chrisel A. Sales, Randy B. Tumacder and Jhelyn Y. Abdulkadil

ABSTRACT. The Global Soil Laboratory Network (GLOSOLAN), under the Food and Agriculture Organization (FAO) put forward the harmonization of soil analytical data around the globe to provide reliable and comparable information between countries, generation of new harmonized soil data sets, and support evidence-based decision making for sustainable soil management. As a response, the Philippines organized the Philippine National Soil's

Laboratory Network (PhilNASOLAN) lead by BSWM and implemented the PD 1435 or the License to Operate Soil Laboratory (LTO – SL) authorizing all Soil's Laboratory to secure LTO-SL certificate and to harmonize the Soil's Laboratories in the Philippines. Thus, this project was initiated to improve the USMARDC-CL's quality system for testing soil for pH, SOC, N, P and K to ensure the reliability and validity of soil test results and conform with the existing standards and regulations. Specifically, to calibrate and repair the instruments used for soil pH, SOC, N, P, and K determination; and verify the methods used in testing soil for pH, SOC, N, P and K. Calibration of instruments were done both by the identified third-party calibrator, the DOST XI-RTSL, and the USMARDC-CL. Calibrated instruments were analytical balance, test weights (10, 20, 50, 100, 200 g), 50 ml graduated burette (2 pcs), 10 ml graduated pipette, 5 ml graduated pipette and pH meter. Instruments were calibrated having coverage factor (k) within the range of 1.96 to 2.02 and is within the assigned range of value with probability of 95%. Methods for soil pH (1:2 soil:water), OM (Walkley-Black Method), P (Bray II and Olsen's method) and K (NH4OAC) test were also verified which were tested on the required parameters that include precision, accuracy, limit of detection (LOD) and limit of quantification (LOQ). Soil OM and P Bray II method met all the required criteria of the test characteristics. The limit of detection (LOD) and limit of quantification (LOQ) for P (Bray II method) is 0.1557ppm and 0.5190ppm, respectively. Furthermore, the soil pH passed the precision (repeatability and intermediate precision), however failed the accuracy test. Soil P-Olsen's method met the criteria for intermediate precision but failed to meet the precision-repeatability and accuracy test. Initially, LOD and LOQ of soil P-Olsen's method, yields 0.0785ppm and 0.2616ppm, respectively while soil K-NH4OAC method were 0.0747ppm and 0.2490ppm, respectively. Both soil OM-Walkley Black and P Bray II methods for analysis can be performed in USMARDC-CL as the results indicate conformity of standard for method verification fit to its intended purpose. Further diagnosis, correction and conduct of method verification tests for soil pH, P-Olsen's method, K-NH4OAC extraction and N-Kjeldahl method should be done to ensure the USMARDC-CL's reliability in performing the said analysis.

Keywords**:** Harmonization, instrument calibration, method verification, soil analysis

2:00-2:20

108 - Cultural Management of Stingless Bees for Sustainable Honey Production

Francisco Gil N. Garcia, Neil Pep Dave N. Sumaya, Josephine R. Migalbin

ABSTRACT. Stingless bees also known as Meliponini are highly sociable insects that are native to tropical and subtropical environments. These bees locally known as "kiyot" and "pilot" are important in a number of ways. These include pollination, production of medicinal honey and other hive products as well as their value in aesthetics. The study was conducted to determine the diversity of stingless bees at the University of Southern Mindanao and the environmental factors affecting diversity and abundance. In addition, pests and disease were identified in bee colonies and an agricultural system was developed for honey production. Using honey-bait technique, only *Tetrogonula biroi* dominated the stingless bee population in USM. Ecological factors affecting stingless bees diversity are temperature and relative humidity with an average of 31.620C and 75.50%, respectively. *Aspergillus* spp. is the fungus observed to be associated with mummified stingless bees. A one hectare was developed for a diversified cropping system. The area has existing crops like calamansi, coffee and papaya. The vacant area in between the existing crops were planted with different vegetables crops such

as sweetpotato, eggplant, okra, pepper, bottle gourd, bitter gourd, alugbati, kangkong as intercrop. In addition, flowering plants like marigold, zinnia and sunflower were planted. The area was developed as bee pastures.

Keywords: stingless bees, *Tetrogonula biroi*, *Aspergillus* spp, agricultural systems, bee pastures

2:20-2:40

109 - Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber

Tamie C. Solpot, Ma. Teodora N. Cabasan, Bernadith T. Borja, Melesa M. Prado, Jomarie Abubakar

ABSTRACT. Leaf diseases of rubber are considered as one of the major constraints in rubber production resulting in lower latex yield. Biological control has been suggested as the most sustainable long-term solution toward disease management. In this project, the occurrence and prevalence of major and emerging leaf diseases of rubber in North Cotabato were determined and the evaluation of effective endophytic fungi against rubber diseases were done. There were seven leaf diseases of rubber observed in five municipalities of North Cotabato, with six (6) already known such as Colletotrichum leaf spot (*Colletotrichum gloesporiodes*), Corynespora leaf fall/spot, Phytophthora leaf fall/blight, powdery mildew, bird's eye-spot disease, and the algal spot disease. A new report of *Colletotrichum siamense* causing leaf spot disease was also described and confirmed. On the other hand, 321 endophytic fungi were isolated in pure culture and was evaluated in vitro using volatile compound assay, quadrant culture, and dual culture techniques for its efficacy against major leaf diseases of rubber. Among the endophytes, 3 (MK4L1-B, K5U2-S, MK3L4-1), 2 (MT4T3-1, MT4L5-31) and 1 (MK5L3-7) completely covered the entire medium and overgrew the pathogens *C. gloesporiodes*, *C. casiicola* and *P. palmivora*, respectively. Results of this study showed that endophytic fungi have a good antagonistic effect on mycelial growth of leaf pathogens of rubber and have the most potential to manage rubber leaf diseases.

Keywords: biocontrol, dual culture, endophyte, fungus, antagonist

3:00-3:20

110 – Development and Acceptability of Mutton-Based Food Products for Emergencies

Jurhamid C. Imlan, Josephine R. Migalbin, Jalaloden B. Marohom, Queennie L. Rufino and Maricel G. Dayaday

ABSTRACT. The project entitled "Development and Consumer Acceptability of Mutton Based Food Products for Emergencies" sought to promote the Halal mutton-based ready-to-eat (RTE) and ready-to-cook (RTC) food products that can be used in emergencies. Today, sheep are spread throughout the world. They live in a small herd and in different areas and environments. In the Philippines, sheep population stagnated from 30,000 in 1992 to the same population in 2002 (E. Davao, 2015). Dr. Patricio Faylon, Former Director of PCAARD explained that "Sheep as a commodity had very low priority as far as research and development concerned." The purpose of this project was on the development and consumer acceptability

of mutton based food products, notably in North Cotabato, to provide baseline data for sheep raisers to determine the market potential of packaged mutton products in the Philippines. Specifically, the demographic profile, level of consumer, level of awareness of Halal foods, attitude towards Halal foods, level of awareness on Mutton-Ready-To-Eat Halal Products, acceptance in terms of product appearance, flavor, aroma, and general acceptability were considered by 218 respondents. Most of the respondents were finished college, students, government employee, and were in their twenties. Generally, the mutton products were moderately acceptable to males. The least concern of the respondents for its acceptability was the price and their lack of awareness of some mutton-based food products. Moreover, the physico-chemical characterization is still on-going. For shelf-life determination, microbial analysis was conducted. Results shows that some foodborne pathogens manifested in samples were less than the standard set by the FDA. Proper storage of these samples such as freezing helps to minimize deterioration and immobilized foodborne pathogens promoting longer shelf-life. Thus, proper cooking and other processes may help to destroy the pathogens. Hence, it can be concluded that samples are fitted to the quality standard.

Keywords**:** Consumer Acceptability, Development, Halal Mutton, Food Products for Emergencies, Ready-To Eat (RTE) and Ready to Cook (RTC) Food Products

3:20-3:40

111 - Development of a Commercial Grade Organic Planting Media using Biochar as the Man Raw Materials

Rezin G. Cabantug and Tito Jun T. Tidula

ABSTRACT. Issues of food security and nutrition have wide-reaching implications for people and their environments, particularly in low and middle-income countries, especially during this Covid-19 pandemic. Having a backyard/urban garden for edible crops involves several cultural inputs. Among these, perhaps the most vital is the kind of growing medium used. Growing media must be amended to provide the appropriate physical and chemical properties necessary for plant growth. Thus, the development of a commercial-grade organic planting media using biochar as the main raw material was explored aiming to develop a biochar-based planting media for backyard gardening and validate its efficiency to support vegetable production. The project was able to produce the necessary substrate for the enhanced biochar and samples are now undergoing chemical analysis. Also, the eggplant trial showed potential in sustainable organic production showing comparable results with commercial organic products. Likewise, the project was able also to produce an organic liquid enhancer that could be used as a foliar fertilizer supplement.

Keywords: Organic agriculture, organic farming, organic soil amendments, biochar-based, concoctions

3:40-4:00

112 - Perpetuation and Production of Red Ginger (*Zingiber officinale* Rovb. Var. *rubra*), Black Turmeric (*Curcuma caesia*) and Makabuhay (*Tinospora rumphii* Boerl) as Promising Raw Materials for Product Development

Abubakar A. Murray, Prof. Frederick John B. Navarro, and Rezin G. Cabantug

ABSTRACT. The Philippines are bounded by many medicinal plants which are commonly used as herbal medicine by the natives. The expensive costs of pharmaceutical drugs today and the rising demand for supplements to boost human immune system due to the Covid-19 pandemic demands the potential of medicinal plants as alternative medicine. As such, the study aims to enhance the utilization of promising indigenous plants in the germplasm collection at PICRI, and reproduce such beneficial plants for possible product development. The project was able to establish the Black Turmeric (*Curcuma caesia*) and Makabuhay (*Tinospora rumphii* Boerl) garden, however the Red Ginger (*Zingiber Officinale Rovb*. var. *Rubra*) plants did not survive due to flooding. Samples were then collected and analyzed for some phytochemical properties. Likewise, the project was able also to produce 3 products for enhancement and reproduction. However, further analysis and testing must be done to ensure the acceptability of this product for commercialization under the USM Foods products.

Keywords: Black turmeric, Red Ginger, Makabuhay, alternative medicine, herbal products

10:10-10:30

201 - Project 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation for Rubber Cropping System

Adeflor G. Garcia, Johnvie B. Goloran, Leandreux D. Ocasion, Argie P. Casis, Oscar J. Jurado

ABSTRACT. The project, developing robust nutrient diagnostic tools and effective chemical formulation for rubber and companion crops to improve rubber productivity was materialized to evaluate the identified/developed protocols for effective analysis of soil availability of N, P and K, and soil nutrient status in the study areas for improving nutrient management and productivity in the rubber-based cropping systems and to determine the most suitable soil nutrient indices for N, P and K as basis for deficiency correction and fertilizer recommendation for rubber plants. Initial results of the study entitled "Physicochemical status of soil and plant and cuplump yield response of rubber as affected by fertilization in different ages of rubber.", showed an estimated 9.9% and 3.6% increase in the cuplump yield of rubber when it is applied with 1/2 rate of chemical fertilizer in 7- and 11-year-old rubber, respectively. Meanwhile, about 3.23% and 1.3% increase in cuplump yield when organic amendment is applied. Based on yield stability performance, 7-year-old rubber trees recorded 32.86 g-1t-1t-1 when applied with ½ rate of chemical fertilizer while 36.55 g-1t-1t-1 in 11-year-old rubber trees. This study provided empirical evidence on attaining the yield potential of rubber with fertilization that will impact on the productivity of rubber.

Keywords: cuplump yield, fertilization, organic amendment, rubber, soil nutrient

10:30-10:50

202 – Potential Anti-Cancer leads from plants in Region XII Proj. Screening of Plants

Lydia C. Pascual, Kate Paula M. Ysulat, Lara Jade J. Estimo, Loveille Jun A. Gonzaga, Harem R. Roca, and Francisco Gil N. Garcia

ABSTRACT. Cancer is the second cause of death worldwide whose treatment remains very expensive and inaccessible to many. Research showed the use of plants as potent anticancer agents that are effective and safe in the management of cancer. This study aimed to determine anticancer plants found in Region XII that can kill cancer cells but are safe to normal cells. Antiproliferative and antimigratory activities of the plant extracts were determined using MTT and scratch wound assays respectively, while toxicity assay: Hepatotoxicity and Nephrotoxicity were determined using Cytotox 96® NonRadioactive Cytotoxicity Assay. Confirmatory Orthogonal assay were determined using CyQUANT™ Direct Red Cell Proliferation Assay using colon cancer cell lines (HCT 116). The results of the study revealed that out of 41 plants samples, 25 plants showed antiproliferative and 30 with anti-migratory activities on liver cancer cell lines (HepG2) at the same time safe to liver and kidney cells except for one sample to be taken with precaution. Confirmatory Orthogonal assay confirmed the anticancer activity of 23 plant samples on human colorectal cancer cell lines (HCT116). The overall results revealed the top priority plant samples for further analysis: 3 Top- tier samples, 8 samples for second-tier hits and 15 samples for third-tier hits. These priority plants samples will be subjected for separation, isolation, and purification to determine the anticancer compounds responsible for its bioactivity.

Keywords: Anticancer, Medicinal plants, MTT assay, Scratch wound assay, Toxicity Assay

10:50-11:10

203 - USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products

Pia Amabelle Flores, Jonald Pimentel, Rowell Nitafan, Vic Lawrence Oliva, Leanne Jay Manceras, Bryan Bretana, Mary Joy Cañolas, Zaibel Rose Tamon, John Rey Agustin, Janice Labatorio, Carlo Reston

ABSTRACT. The USM LIFER Project is an initiative of the Philippines Futures Thinking Society under the Office of Senator Pia Cayetano based at the University of Southern Mindanao. It aims to investigate potential protein sources in Ligawasan Marsh towards a futuristic approach in empowering its communities. The project is composed of seven components to represent holistic approach from fish stock assessment to policy development, product development, product quality assurance, and even capacity- building in Ligawasan marsh community itself. With these, the following outputs were accomplished: (1) evaluated fish stock of nine important fishery resources in one Ligawasan Marsh fish landing site; (2) conducted surveys to profile social demographics of Ligawasan community; (3) evaluated shelf- life of catfish Ready- To-Eat products at one- month storage condition; (4) inspected quality assurance in fish RTE products; and, (5) conducted capacity- building activities on fish processing food safety for Ligawasan Marsh community. Another study was incorporated in the project on RTE meat- based products as protein source such as luncheon meat, sausage, bacon, and corned pork meat products wherein sensory evaluation was investigated. The project presents a strategic ground to provide long-term economic and social impacts in Ligawasan Marsh through effective resource management, and offering livelihood opportunities from developed fish- based RTE product from available resources. The project herein believes that this is the start of creating the bright future for Ligawasan Marsh.

Keywords**:** Ligawasan Marsh, Future's Thinking, Protein, Ready-to-Eat (RTE), Food Security

11:10-11:30

204 - Banana Health Diagnostics: Molecular Surveillance of Major Disease Causal Pathogens of Banana in Region 11 and 12

Edward A. Barlaan and Jeralden O. Vido

ABSTRACT. Banana production in the Philippines is constrained by different diseases adversely affecting export industry and domestic consumption. Major diseases in banana include Panama disease caused by *Fusarium oxysporum* f. sp. *cubense*, bunchy top by Banana bunchy top virus and Moko by *Ralstonia solanacearum*. The study generally aimed to assess the health status of different banana growing areas in Regions 11 and 12 through advanced molecular approaches. Specifically, it aimed to determine the disease-related problems in banana growing areas; employ molecular detection and monitoring of causal pathogens banana diseases utilizing the highly specific probes (probe kits) for target pathogens using digital PCR (dPCR) and quantitative real-time PCR (qPCR) technologies; and provide feedback information to the banana growers on the health status of banana production areas.

Representative samples from plants and soils were obtained through collaborations with banana individual farmers, cooperatives or associations, tissue culture laboratories, national corporations and multi-national companies comprising a collective production area of 26,484 hectares. Of the three major diseases, Panama was the most prevalent in both regions. The causal pathogens were detected and monitored in diseased and healthy-looking plants or soils using the probe kits assayed in dPCR or qPCR platforms. The dPCR was more efficient in detection than qPCR particularly at very low microbial loads. These new technologies also helped in pathogen detection and monitoring in various control or preventive measures for Panama disease employed by government and private entities. Hence, this study affirmed the utility of the probe kits and advanced molecular technologies to support and help the banana industry.

Keywords: banana, banana bunchy top, Digital PCR, Moko, quantitative real-time PCR, Panama disease

1:20-1:40

206 - Validation of Molecular Markers for Identification of Cacao HYVs, Criollo Types and Disease Resistant Varieties through Marker-Assisted Breeding

Edward A. Barlaan, Allen Jay E. Austria, Janelle B. Opinaldo

ABSTRACT. There is a need to validate the molecular markers were generated from the completed DOST-PCAARRD funded project for utility in varietal identification and potential use in marker assisted breeding. The study aimed to validate SSR markers to identify NSIC recommended cacao varieties in commercial nurseries; to assess the claimed Criollo cacao types in the Philippines for identification of true Criollos, and to validate the SSR markers for identification of cacao breeding materials with resistance to vascular streak and Phytophthora diseases. The Bureau of Plant Industry and accredited cacao nurseries in Regions XI and XII were communicated for collaboration of the project. Leaf samples were used for DNA extraction, PCR amplification and fingerprint analysis using the primers of functional SSR markers. A total of 555 leaf samples from randomly selected cacao seedlings were collected from 39 nurseries across Regions XI and XII. Of 175 UF18 and 125 BR25 validated, about 17% were non-UF18 and 28% non-BR25, respectively. One hundred ninety-eight claimed Criollo types along with Forastero, and Trinitario collected from different regions in the Philippines were analyzed using the SSR markers. The cluster analysis based on 22 primers exhibited three major clusters indicating Criollo, Trinitario and Forastero groups. Cluster analysis showed putative true Criollo types, which needed further evaluation at phenotypic and genomic levels. Twenty-one cacao accessions from the USM genebank were collected and molecularly screened for disease resistance. SSR markers C10238t1 and C1618t2 were used for screening *Phytophthora palmivora*; and C4101t2, CDRAat11 P3T7 C74 and C1223t3 for *Lasiodiplodia theobromae*.

Keywords**:** Cacao, SSR Markers, NSIC Varieties, Disease Resistance

1:40-2:00

207 - Technology Development for Corn Silage Production and its Utilization

Jessie G. Elarde, Nenita E. Olero, Geoffray R. Atok, Jurhamid C. Imlan & Mary Ann B. Rama

ABSTRACT. The unstable supply of forage materials is one of the major drawbacks in livestock industry which this experiment tries to address through the development of forage corn with high silage yield, understanding the effect of feeding corn silage without corn ear to small and large ruminants in terms of milk yield, weight gain, and carcass quality and determining what is the most profitable interaction of fertilizer, plant density, and variety in terms of silage yield. In developing forage corn, there were 204 tall families selected from USM Var 5 and these will be advanced for more cycles of the modified ear-to-row breeding system until reaching a height of more than 3 meters. Three thousand ninety-four kilograms (3,094 kgs) of corn silage with ear and one thousand nine hundred kilograms (1,900 kgs) of corn silage without corn ear were produced for feeding to experimental animals. Laboratory test results show that silage without ear had almost similar to those silage with corn ear and Total Mix Ration (TMR) of USM-Philippine Carabao Center in terms of percentage Ash (9.29%), Crude Fiber (10.03%), Fat (10.24%), Acid Detergent Fiber (58.49%) and Neutral Detergent Fiber (71.86%). The most profitable interaction of fertilizer, planting density, and variety was observed from USM corn Hybrid NCH 33 planted at a density of 133,333 plants/ha and fertilized at the rate of 120-60-60 kg/ha NPK with a net income of Php55,008/ha. The erect leaf architecture of NCH 33 which reduces mutual shading might be the reason why this hybrid is suitable for high-density planting.

***Keywords*:** carcass quality, corn silage, forage, milk yield, modified-ear-to-row

2:00-2:20

208 - NICER Project 1 – Molecular Fingerprinting of Cacao parental Recommended HYVs and true Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Profitability

Edward A. Barlaan, Bernadith T. Borja, Alvin John R. Quitel, Elcy Jane C. Naquitquitan, Kristine D. Paguntalan

ABSTRACT. The validated SSR markers for cacao are essential tools for identification of genuine varieties to guarantee planting of true-to-types to ensure increased productivity and profitability. The study aimed to identify and molecularly fingerprint parental sources of recommended cacao HYVs and true Criollo for multiplication of quality planting materials and to propagate and distribute the certified true-to-type cacao varieties as mother plant sources or genetic stocks. Functional SSR markers were used to validate NSIC recommended varieties and differentiate true Criollo types from non-Criollo accessions. Forty-one accredited nurseries across Regions XI and XII agreed in collaborating with the project. Leaf samples of cacao mother plants from different accredited nurseries were collected and stored. Claimed Criollo-types leaf samples were collected from different regions of the Philippines. DNAs of collected leaf samples were extracted, quantified and used for PCR amplification and gel electrophoresis. Assessment of claimed-criollo types using SSR markers is underway. For NSIC cacao varieties, most varieties sold in the nurseries are BR25 and UF18. From molecular verification,

57 genuine BR25 mother plants from various nursery sources were identified using the marker C8223t1 while 99 genuine UF18 were identified using C7729t1. Molecularly verified and BPI-certified cacao seedlings of UF18 and BR25 were propagated and distributed to different cacao nursery operators and farmers in Regions XI and XII. So far, a total 3,830 cacao quality planting materials were already distributed to 74 cacao nursery operators and private individuals. About 3,500 PBC123 seedlings were planted to serve as root stocks for further clonal propagation and distribution.

Keywords: Cacao, Criollo, NSIC varieties, quality planting materials, SSR markers

2:20-2:40

209 - NICER Project 2 – Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement

Gwen Iris D. Empleo, Ms. Ivy Pasquin, Ms. Avigel I. Cabrillos, Ms. Jeannie R. Binaohan, Erwelle Evan Escalante

ABSTRACT. The identification of *Theobroma cacao* L. clones that possess desirable traits for varietal improvement is essential to meet changing production and market conditions. This project addresses the problems on the relatively low yield and low bean quality in cacao, and the prevailing diseases and pests affecting cacao productivity. The main goal of this project is to carry out effective cacao breeding strategies for the development of cacao varieties with improved yield, bean quality, and resistance to diseases and pests. The project aims to rehabilitate the existing USM cacao gene bank; enhance the USM cacao gene bank through the introduction of additional cacao clones; evaluate the morphological and agronomic characteristics of the cacao clones for the development of the Philippine cacao catalogue; develop cacao hybrids with high yield, bean quality, or resistance to pests and diseases, and validate the F1 identity of the products of crosses using molecular approaches. To date, scions from 66 cacao clones were collected from the Davao Bukidnon and Camiguin Island and grafted at the USM nursery. A total of 69 fruit-bearing cacao clones were partially evaluated at the morphological level using the available descriptors. Seedlings from F1 and 3 three-way crosses developed from selected parents through hand pollination are grown in the nursery.

Keywords: Breeding, Cacao, gene bank, hybridization, introduction

3:00-3:20

210 - Nicer Project 3 – Development of Optimized Post-Harvest Processing Approaches for Improved Quality of Cacao Beans

Renel M. Alucilja, Maricel G. Dayaday, Sheena B. Lucena, Lydia C. Pascual, Ritchell Joy T. Cuarteros, Jayson S. Baltazar, Keith Bryan V. Marcelino, Denver Von O. Ariaga, Sanshine O. Lacsao and Nelly Grace F. Toñacao

ABSTRACT. Cacao bean quality significantly influences the market price of cacao-based products. Limitations such as inadequate knowledge and expertise in post-harvest processing technologies, unavailability of post-harvest processing facilities, and lack of access to market information and high-value markets must be addressed. This study aimed to develop optimized post-harvest processing approaches for improved quality of cacao beans. The design for the

development and optimization of post-harvest machines was crafted. Fabrication and modifications of the machines and prior runs were done in preparation for the operational testing. Benchmarking surveys for the drying, fermentation, pod storage, and bean storage were done in 17 different sites of Region XI, XII, and XIII to determine the common practices for innovation and optimization. Preliminary studies on fermentation and drying were conducted and samples were submitted for analysis. The physico-chemical analysis determined the different nutrient content and chemical compositions of processed cacao beans. A total of 53 samples were collected and among the bean samples, fermentation of 5 to 9 days was slightly acidic in terms of pH and has a higher percentage value of titratable acidity (acetic acid content). Direct sun drying of 7 to 9 days and mechanized drying of cacao beans indicated a lower percentage of moisture and fat content. Meanwhile, the ash content of all the collected cacao beans lies on the typical value and has a higher percentage of carbohydrates. Region XII recorded higher protein content compared to samples collected in Region XI.

Keywords: Benchmarking, Cacao, Optimization, Physico-chemical, Post-harvest

3:20-3:40

211 – Microbial Diversity of Liguasan Marsh and their potential biotechnological applications in green energy, fisheries, sustainable agriculture and animal production, and human health

Maria Elena N. Tanabe, Cromwel M. Jumao-as, Chea Mae O. Libo-on, Jade Amythist C. Sevillano

ABSTRACT. Liguasan Marsh is the largest wetland in the Philippines. Its high biological productivity supports the livelihood of the communities around the area. The unique ecological environments of the marsh made them a hotspot for studies such as discovering novel bioactive compounds from microorganisms. This study aimed to isolate novel metabolites from microorganisms that have potential for agricultural, industrial, and pharmaceutical applications in Liguasan Marsh. Soil and water samples were collected from Cuyapon, Kabacan, Cotabato. The soil's culturable microorganisms were isolated and tested for Indole Acetic Acid (IAA), Hydrogen Cyanide (HCN) and Ammonia production, and Phosphate Solubilization Efficiency (PSE). A total of 15 microalgal genera were presumptively identified from the two-month-old heterogenous algal culture. Microscopic examination revealed Chlorella sp. as the most abundant species in the culture, while Scenedesmus as the most dominant genus. Protein and lipid content of microalgae were determined by proximate analysis. Results show that the protein content was about 18.4%, while lipid constituted 0.234% of the entire biomass. A total of 55 bacterial and 18 fungal colonies were isolated from soil sample collected from Liguasan Marsh. Among the 55 bacterial isolates, five isolates were positive for indole acetic acid, twenty-seven for ammonia production, and four for hydrogen cyanide production. In addition, 36 out of the 55 isolates were tested for phosphate solubilization. Seventeen isolates exhibited positive for phosphate solubilization which ranges from 1.01 to 1.78 PSE. The plant growth promoting attributes of the isolated fungi were scheduled for testing on the fourth week of November, 2022.

Keywords**:** Ammonia, Indole Acetic Acid, Liguasan Marsh

3:40-4:00

212– University of Southern Mindanao-Treelife Coco Sugar Research and Development

Maria Elena N. Tanabe, Ivy Jane P. Nabre, Chea Mae O. Libo-on, Cromwel M. Jumao-as

ABSTRACT. Phosphorus is one of the macro-elements required by plants to grow. However, plants could not utilize the available insoluble phosphorus in the soil. Hence, microorganisms that can hydrolyze organic and inorganic phosphorus to soluble phosphorus are essential. This study aimed to develop phosphate solubilizing bacterial inoculants isolated from locally produced soil amendments. Bacteria from the locally produced soil amendment were isolated and screened for phosphate solubilizing activity using Pikovskaya agar. The four isolates that showed the highest phosphate solubilization efficiency were considered and subjected to compatibility testing in dual, triple, and quadruple formulations. Among the nine isolates tested for phosphate solubilization, *Bacillus altitudinis* USM-ISOK4, *Bacillus subtilis* USM-ISO19, *Bacillus megaterium* USM-ISOP9, and *Bacillus aryabhattai* USM-ISOP10 were chosen based on their individual phosphate solubilization efficiency (PSE) 11.19, 11.9, 11.63, 10.8, respectively. The formulations from the four isolates showed compatibility. Among the dual, triple and quadruple formulations, dual-culture formulations of *B. subtilis* - *B. megaterium* (11.23), and *B. subtilis* - *B. altitudinis* (12.27) have the highest PSE. Dual formulation *B. subtilis* - *B. altitudinis* (12.27) showed significant difference between *B. aryabhattai* (10.8), formulations of *B. aryabhattai–B. subtilis* (10.87), *B. megaterium – B. altitudinis – B. subtilis* (11.83), and *B. megaterium–B. aryabhattai–B. altitudinis–B. subtilis* (10.83). The study recommends the optimization of the PSE of all the isolates, in vivo testing of the single and formulated isolates, and carrier testing for packaging and shelf-life.

***Keywords*:** Bioformulation, Bioinoculant, Dual culture, Phosphate solubilizer, Soil amendment

10:10-10:30

301– Research Into Practice: Practical Applications of English for Specific Purposes (ESP) in the Workplace

Glyn B. Gabano-Magbanua, Lawrence Anthony U. Dollente and Anamarie B. Uyangurin

ABSTRACT. English for Specific Purposes (ESP) is a language teaching approach focusing on the development of language skills needed by learners for success on the job. ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. Today, it has become one of the most prominent areas of foreign language teaching and its practice is centered on the language appropriate to specific activities in terms of grammar, lexis, register, study skills, discourse and genre. For this specific project, the researchers identified and categorized errors in the written materials of public safety and academic professionals and utilized the result to develop materials to enhance the discursive competence of professionals through ESP. Police reports as well as abstracts and narrative reports comprised the corpus of the study. Error analysis was conducted in six stages: data collection, data reduction, data coding, error identification, error classification and reporting. Errors were categorized into lexis, syntax, mechanics. At the lexis level, the most frequently occurring errors include articles, preposition, conjunction, relative pronoun, verb tense and consistency. At the syntax level, identified errors include misplaced modifiers, fragments, ambiguous construction, parallelism and run-on. Errors in mechanics were likewise observed especially in the reports written by public safety officers. Numerous moves in organization were also observed in the materials collected. For the abstract, moves identified include: I-O-M-R, O-M-R, I-O-R, O-R-M and I-M-R. A self-help instructional material was designed to respond to the needs identified in the study.

Keywords: error analysis, ESP, lexis, syntax

10:30-10:50

302 – University of Southern Mindanao Graduate Tracer Study: Input for Institutional Quality Assurance

Riceli C. Mendoza, Nora B. Bolences, Julius Jerome G. Ele, Jonald L. Pimentel, Jeannie U. Duka, Ma. Lezel P. Pataray, Ivy Mar Cabornida, Melecio C. Cordero, Jr., Elizabeth Molina, Manuel J. Tayong, Emmalyn Mamaluba, Abdulnasser G. Makalugi, Norge D. Martinez, Ronielyn F. Pinsoy & Leorence C. Tandog

ABSTRACT. The third phase of graduate tracer study is spurred with the desire to initiate and entrench GTS as means by which quality assurance in the university is achieved. Since the dynamics of employment is dependent on the kind of competencies needed, universities have to be forward looking to address and engineer desirable changes. In light with the current issue, this study is conducted to determine the employability of USM graduates and enhancement of program offered by the university in order to meet the changing educational, socio-economic, industrial and technological demands on the new century. This study used descriptive survey method involving graduates from 2018-2021. As of data gathering, 20.54% total graduates are able to answer the questionnaire crafted by the Commission on Higher Education (CHED) and slightly modified for the purpose of the study. Said research instrument is sent in google forms where data from all responses are available immediately after each form submission in the

responses tab. Results revealed that 2, 051 were able to answer the survey questionnaire for undergraduates in which 63.82% of them were female while 36.18% were male; 87.91% were gainfully employed wherein 51.73% of them have jobs related to their course completed and 11.41% were unemployed. One-hundred fifty post-graduates were able to answer the questionnaire; 73.33% were female and 26.67% were male. Most of the respondents were Teachers, Instructors and Professors. For the undergraduates, 77.96% were very much satisfied with their degree's Flexibility/Adaptability, 66.85% strongly agreed with the respect being shown to them in their learning environment and 87.03% identified library as the most adequate facility in the university. Moreover, computer skills were considered to be what their curriculum has prepared them for the job. Communication skills were very much useful to the present job of the respondents. Asking questions for clarification from the appropriate source (71.92%) were the respondents' perception on competencies, trying to find the best method to do a given job (34.91%) were their perception on skills and believing that every person in the world should be treated equally (71.48%) was on values. Content of curriculum offered was considered to be the university's most observed strength. However, the study identified exchange programs as one of the areas that should be improved. In terms of communication skills, most of the respondents can express themselves easily and as graduates, they considered themselves as compliant, determined and flexible. It is true to the respondents that respecting opponent/s is part of their teamwork and problem-solving skills (41.88%) while believing that teamwork is best when everyone is involved in taking decisions as part of their leadership skills (67.48%). For the post graduates, 100% were employed; 43.33% were very much satisfied with their job and 84.00% of the respondents have jobs related to their post graduate degree, 80.65% rated that academic knowledge has the highest contribution of their degree at USM. Expanding knowledge of fields related to the current areas of professional specialization ranked first as the graduates' reason for pursuing post graduate at USM. After earning their post graduate, 74.67% continue working as employee or stay in their current job. In terms of the learning environment, 72.67% strongly agreed of showing respect to a person and 86.00% identified classrooms as the university's most adequate facility. For perception of competencies, values and skills, 70.67% described themselves as admitting to mistakes, 70.67% believed that every person in the world should be treated equally, and 38.67% considered solving a problem focusing on its main point, respectively. The results further show that respondents can express themselves easily and 63.33% considered themselves as calm, happy, compatible and cooperative. It is true to the respondents that respecting opponent/s is part of their teamwork and problem-solving skills (51.33%) while believing that teamwork is best when everyone is involved in taking decisions as part of their leadership skills (69.33%).

Keywords: Harmonization, instrument calibration, method verification, soil analysis

10:50-11:10

303 – University of Southern Mindanao Graduate Tracer Study: Input for Institutional Quality Assurance

Jacinta T. Pueyo, Karizza Jane B. Pejaner, Jemima M. Atok, and Kevin Ray V. Abesamis

ABSTRACT. Philippines in the latest Programme for the International Student Assessment (PISA) Examination showed the need for reforms and recalibration of the K to 12 Program to further achieve its purpose. However, this research discovered that one of the salient features of the K-12 program, which are its globally competitive competencies, particularly in the critical areas of Mathematics, Science, and English, are deficient in the first-year students

attending four (4) different universities in Cotabato in Academic Year 2021-2022. This quantitative research employed standardized examinations to assess the students in different competencies supposedly achieved in the K-12 program. The 519 target respondents were profiled where they achieved mean scores for each subject ranging from 9 to 10 which are far lower than the expected scores they should have for each subject after graduating from Senior High School. The intersectionality framework was used to identify the hidden barriers that led to the students' performance in the examinations outside of educational instruction which are commonly overlooked in these kinds of studies. Results showed that there is a weak positive relationship between the socio-demographic characteristics and the scores in English, Science, and Math. Specifically, the degree program, institution, religion, residence, mother tongue and disability are weak determinants of the scores in these subjects. However, this should not be taken for granted, the weak relationship would tell us that these variables still have an impact to the competencies of the K-12 graduates. Based on these, the safe space environment, where everyone will feel included, and learning guide were developed.

Keywords: Competencies, intersectionality, K to 12 graduates, K to 12 program, general education

11:10-11:30

304 – Design and Development of Online Pre-Registration System for University of Southern Mindanao

Arjay S. Agbunag, Nelson Balneg Jr. and Ralph Butch Garidan

ABSTRACT. The Covid-19 pandemic has successfully forced global shutdown of several activities, including educational activities, and this has resulted in tremendous crisis-response migration of universities with online platforms. This also hinders the process of enrollment in the university. Part of the process in enrollment is the admission or registration of students' profiles. An online registration system eliminates the need of filling paper forms manually and sending them to a registration office. When using online registration systems, the participants can simply register at their convenience and submit their information immediately. Thus this study proposed an Online Preregistration System for the university. The system provided a way to minimize unnecessary contact and exposure to coronavirus. This study sought to develop an online pre-registration platform for the university. Specifically, it sought to implement an online pre-registration system for freshmen and transferee students; generate statistical report bases for decision making; and evaluate the developed system in terms of functionality, usability, and performance efficiency. The system was developed using an agile development methodology in the study. Phases including planning, designing, coding, and testing are part of this process. There were two (2) applications developed: Pre-registration, a web application written in the PHP language; and Enrollment Backend API, a web API written in C# on.NET 5. The enrollment API is responsible for accessing the enrollment database. All enrollment-related data access is required to pass through the API for portability and security. The pre-registration web app is responsible for implementing business logic for admission processes. Additionally, the researchers evaluated the current procedure to find potential solutions and brainstormed with a group of people to design the system.

Keywords: admission process, registration, online pre-registration

1:00-1:20

305 – Development and Implementation of Online Application for Graduation and Final Clearance System

Ryan Z. Gonzaga, Alvin C. Mibalo, Elizabeth R. Genotiva, Danilyn A. Flores and Nor-Aine M. Corpuz

ABSTRACT. The purpose of the research is to design, develop, and implement an online application for graduation and final clearance system for the University of Southern Mindanao. It aimed to transition the clearance process from paper-based to automated which will introduce a faster way of processing of application for graduation and final clearance. The following software and programming language was utilized in designing and developing the system; PHP,Javascript, Navicat, and MSSQL for its database. The developed system was presented to the university ARO director and the university registrar. After the testing was concluded, they suggested minor changes including the gender label. In conclusion, the system gained a positive response from the respondents. They both recommended that the developed system should be deployed and utilized.

Keywords: Development, Online, Clearance, Application for graduation, Innovation

1:20-1:40

306 – Project Title: USM-IPTBM Phase: II Patent Mining of Rubber Technologies thru Intellectual Property and Technology Business Management (IP-TBMP) Operations of the University of Southern Mindanao

Pia Amabelle M. Flores, Cyrelle M. Besana, Abegail B. Sauyen, Mark Henry F. De Leon

ABSTRACT. The Patent Mining project is a continuing project of IPTBM funded by DOST-PCAARRD from 2021-2022 pursuant to Republic Act NO. 10055. The project serves to satisfy the following objectives: 1) capacitate technology transfer personnel of the University of Southern Mindanao IP-TBM Office on patent mining; 2) investigate emerging rubber technological trends and recommend priority R&D programs through patent mining; 3) enhance IP policies and technology transfer protocols of other SUC's to harmonize IP management and technology transfer activities; and, 5) provide support to the development of the IP-TBM Real Time Monitoring System (RTMS). The project serves as breakthrough in accomplishing licensing agreements and executing "Fairness Opinion Report". The IPTBM was key in the first copyright registrations from IPOPHIL, trademarks from research- based technologies and enhanced the University's IP asset. Among the highlights accomplished through project includes: Five (5) USM OPV and Hybrid corn technologies assisted for licensing; enhanced IP asset with 10 registered Utility Models, 7 registered trademarks and 21 registered copyrights. The project conducted Consultation Meeting for Rubber Industry Strategic S&T Plan (ISP) which was participated by national industry partners, private sectors, technical experts, DOST-PCAARRD, IPOPHL and selected SUC's. The information gathered from the consultation were instrumental in the crafted "Commodity Report for Rubber" and partial "Patent Landscape Report for Rubber". The re-unveiling of the IP-TBM marker in its new venue at the USM DOST-PCAARRD Technology Center (DPTC) commemorates the collaboration of the two agencies to foster intellectual property and technology commercialization activities in the University.

Keywords: Intellectual Property, RA 10055, Research and Development, Technology Commercialization, Technology Transfer, USM IP-TBM

1:40-2:00

307 - Project Title: DOST PCAARRD and USM Agri-aqua Technology Business Incubator (USM-ATBI)

Pia Amabelle M. Flores, Jalaloden B. Marohom, Benjie B. Mari, Connie Jean J. Guinmapang, Joshua G. Canlas

ABSTRACT. DOST-PCAARRD and USM pioneers agri- aqua technology business innovation in the University pursuant to "Innovative Startup Act of the Philippines (RA 11337)" which aims to satisfy the following objectives, to: 1) capacitate USM ATBI personnel; 2) identify and establish partnership with the incubatees; 3) identify and establish linkages among agencies, clients, markets, and funding sources to sustain the operation of the ATBI; 4) provide technical assistance, business development services, marketing assistance, and administrative services to the incubatees; 5) enhance USM's technology transfer and product promotion efforts. USM ATBI paved way to the University's milestone of accomplishing it's first licensing commercialization for USM Corn OPV and Hybrid technologies. Through ATBI platform, the University's first Technology Licensing Agreement (TLA) and TBI Operation Manual was crafted which are important basis for licensing and agri- aqua innovation. At the moment, USM ATBI continually provides technical, business and marketing assistance to its 13 incubatees which ventures on banana floral apex tissue culture, halal chevon products, turmeric products, organic agricultural farm products, seafood ready-to-eat (RTE) products, rabbit farming, mushroom products, corn varieties/ technologies and agri-tourism ventures.

Keywords**:** USM ATBI, RA 1137, Technology business incubation, commercialization, incubatee

2:00-2:20

308 – Integrating Gender and Development (GAD) Concepts Across Mandated Language, Literature, and Social Science Courses

April Rose T. Butalid, Elangbai K. Dimasingkil, Estella B. Barbosa

ABSTRACT. GAD integration or gender mainstreaming into the curriculum is a mandate among all Higher Education Institutions (HEIs); this ensures that gender issues are considered in the delivery of instructional goals and objectives with the aim of achieving and maintaining gender equality. This study has determined the practices on integrating GAD concepts and activities into the syllabi and classrooms among faculty members teaching language, literature, and social science courses. Specifically, the study has determined the practices and activities on GAD integration, identified the GAD concepts that are incorporated into the syllabi and classrooms, and recommended actions and processes for GAD mainstreaming into the university curricula and other instruction-related activities. Descriptive research design was employed in this study. Data were gathered using a survey questionnaire. Syllabi and modules were also used as secondary data to identify the GAD-related concepts integrated. Forty-four (44) faculty members from the University of Southern Mindanao served as the respondents of

the study. About 29.55% of the respondents were English language professors, 18.18% were literature professors, and more than half (52.27%) were social science professors. Results have revealed that practices and activities on GAD integration are usually employed, and GAD concepts are highly integrated in language, literature, and social science courses. Such practices include using gender-fair language in the classrooms, calling students regardless of their gender orientation to recite during the discussion, and explaining how the subject exposes the role of women in the society. Moreover, GAD concepts including roles of men and women, societal expectations, and women empowerment are always integrated into their classes. The respondents also have agreed that GAD-related policies concerning gender mainstreaming into the university curricula should be implemented. Therefore, strengthening the integration of GAD concepts and activities in instruction would help in achieving the vision of creating and sustaining a gender-responsive society.

Keywords**:** GAD concepts, gender and development, language courses, literature courses, social science courses

2:20-2:40

309 – PPMP Automation for Productivity Improvement of e-Admin Services

Eugene G. Ranjo and Arjay S. Agbunag

ABSTRACT. The project was conducted to develop an automated system for preparing and consolidating the Project Procurement Management Plan (PPMP) of the University of Southern Mindanao. PPMP is a guiding document in the procurement and implementation process in the university that serve as a vital reference to some research, offices, colleges, and other units as well. This serves also as an essential tool in the resource and financial management that allows the procuring entity to a flexible optimizing utilization of scarce resources. Some serious reason was identified for the preparation and consolidation of the PPMP. The main elements in the PPMP should be ensured and must be accurate and comprehensive because reflected estimation will serve as a basis for the generated future monthly and annually consumptions of supplies, materials, and other components from the PPMP that need to be consolidated manually and done for a couple of days to finish. That is why an automated system was planned to develop to attain the very tedious task in every preparation and consolidation time of PPMP. The accomplishment of the project showcased the final design of the PPMP automated system that was developed according to the gathered requirements like procurement procedures, problems encountered, and other details of the suggested interface and contents that were included in the system development. Moreover, to test the workability and accessibility status of the developed PPMP automated system an ongoing series of testing will be able to conduct to ensure that the automated system will deliver a most convenient working space in preparing and consolidating PPMP and provide a hassle free, fast, and accurate output to any users.

Keywords**:** procurement, annual planning, automation, system development, budget

3:00-3:20

310 – Sustainable Green Library of USM

Anita C. Sornito, Susan S. Martinez, Saque J. Amilbahar

ABSTRACT. Building energy profile, energy consumption and energy reduction are the primary concerns of the present research project. The project aims to make the USM Library (USM-KEPLRC) sustainable, green and resilient to uncontrollable change in local climate which is anchored to SDG-9. The research study applies a paradigm shift from the usual design, construct, operate, and maintain building structure. The project will be conducted for 3 years which started on the year 2022 with three components namely: study 1- SM Library Wind Simulation and Energy Consumption Reduction Formulation, study 2- USM Library Sustainable Horticulture and Landscaping and study 3 – Sustainable Green Library Programs and Practices. The research project will proceed from making a Building Information Model (BIM) of USM –KEPLRC, determining the energy profile and energy consumption, to horticulture landscaping and sustainable in the second year and sustainable program and policy making for the third year. The research project involves building modeling and energy simulation softwares. Data taken from the energy audit and softwares will be used to apply green initiatives like, horticulture and physical landscaping, and eventually use for program and policy making of the whole building. The result of this research project will have an impact on the measures and mechanism on making a structure green, sustainable and resilient to climate change.

Keywords: green library, sustainable library, USM BIM, energy audit, energy simulation

3:20-3:40

311 - Upgrading of Cacao Post-Harvest Processing Center Facilities of USM

Harem R. Roca and Sheena B. Lucena

ABSTRACT. A project was conducted with the general objective of upgrading the Cacao Post-harvest Processing Center at the University of Southern Mindanao through the physical rehabilitation of the existing cacao post- harvest processing building, acquire modern equipment and facilities, mechanize tablea processing, and support on-going and future cacao research activities. It has a duration of one year and is funded by DOST-PCAARRD-IDD with an appropriation of Php 5,000,000.00. The project was officially granted a one year extension by the funding agency. About 80% of the total number of equipment had been already delivered, installed and tested in two batches. Some are already used in tablea processing. The rehabilitation of the building started last April 2022 and is being undertaken by the USM Administration. When fully refurbished, the facility is expected to be operationalized for the production of high quality 'tablea', and at the same time as a shared facility for training, transfer of technology and for various research, development, and extension endeavors of the university.

***Keywords*:** cacao, equipment, post-harvest, processing, upgrading

3:40-4:00

312 – Upgrading of Tissue Cultures Facility in University of Southern Midanao

Mark Al-jamie J. Muttulani, Harem R. Roca, and Edward A. Barlaan

ABSTRACT. Tissue culture is an important technology to produce disease-free and high-quality planting materials for rapid production of many uniform plants. This technology has been used in mass production of planting materials for various economically important crops. This has been instrumental in supplying tissue-cultured banana planting materials in various banana growing areas in the Philippines. University of Southern Mindanao (USM) has tissue culture facility that becomes instrumental in training students, researchers and private enterprises engaged in tissue culture in banana and other crops. However, the current facilities for tissue culture and biotechnology in USM are already antiquated and inadequate to house many equipment. Thus, there is an urgent need to upgrade the tissue culture laboratory. The objective of this project is to upgrade the University of Southern Mindanao tissue culture laboratory with new facilities and equipment in tissue culture. It can also be a platform for research and production programs of USM and training for tissue culture and thesis of students both undergraduate and graduate students and other stakeholders.

Keywords**:** Tissue Culture Laboratory, Upgrading

4:00-4:20

313 - Upgrading of High Value Crops Food Processing Laboratory at University of Southern Mindanao

Sandra Joy P. Pahm and Harem R. Roca

ABSTRACT. The High Value Crops Food Processing Center based at University of Southern Mindanao was established in 2012 with funds from the Department of Agriculture-Bureau of Agriculture Research (DA-BAR). It has become the processing center mainly for high quality turmeric tea and its variants and the production of the USM 'tableya' which are produced from home-grown cacao trees. The cacao trees were the result of various research and collaboration in the university with more than 100 varieties and accession of cacao are now being grown productively. Availability of efficient postharvest facilities are necessary for the development of the important characteristics and quality fine flavor beans. With the increasing supply of cacao beans for processing, it prompts the need to upgrade the Center which will be involved on improving and optimizing cacao postharvest operations such as fermentation, drying and roasting in response to the needs of the cacao farmers for appropriate technologies that are efficient, accessible and, affordable. Likewise, it is also important to acquire state-of-the-art equipment to be used in developing high quality chocolate products that are affordable to the ordinary Filipino consumer.

Keywords**:** cacao, high value crops, processing, tableya

10:10-10:30

401 - USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat) RTE Products Component 6: Capacity Building on Fish Processing Food Safety at Ligawasan Marsh Community

Mary Joy S. Cañolas, Carlo K. Reston, and Pia Amabelle M. Flores

ABSTRACT. Pikit is one of the municipalities in Cotabato that shared the abundance of flora and fauna of Ligawasan Marsh. A variety of inland fish is caught by the tons every day with which mudfish (*Channa striata*) being the most abundant. Hot smoking of mudfish is one of the prominent enterprises along the national highway of Pikit, Cotabato. Thus, this component project aimed to (1) increase the capacity of the fish processor-entrepreneurs on fish processing food safety, (2) increase awareness of the techniques of fish smoking using wood chips, and (3) develop IEC print materials as a ready reference. Social preparation includes coordination and inception meetings, translation, and conduct of Training Needs Assessment (TNA) and validation, organizing, and profiling of the target beneficiaries. Training methodology includes lecture-discussion, techno-demo, and participatory sensory evaluation of smoked mudfish using hot and cold smoking techniques with different combusting materials. Distribution of certificates of completion and TeknoGiya leaflets were the highlights of the closing program. TNA results revealed that they had little/no knowledge of the brining and drying process. Post-test results increased while very satisfactory results were obtained for the resource persons and overall training activity evaluations. Significant differences ($P<0.05$) were observed in terms of firmness, taste, and general acceptability in favor of the cold smoking technique using wood chips. Majority of the beneficiaries were willing to buy cold smoked mudfish if available in the market.

***Keywords*:** Ligawasan Marsh, Future's Thinking, Protein, Ready-to-Eat (RTE), Food Security

10:30-10:50

402 - CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate COVID-19 Effects

Tamie C. Solpot, Frederick B. John Navarro, Ivy Mar B. Cabornida, Pamela B. Villanueva

ABSTRACT. The COVID-19 has greatly affected the country and has caused loss of lives and disruption to the economy. Cacao (*Theobroma cacao*) is considered as one of the most important crops grown in the Philippines that could provide a potential source of income and have been acclaimed for many years for their health benefits. This project aims to address the limited good quality planting materials (QPM) of promising cacao clones to help strengthen the cacao industry by area expansion and promote cacao-based products as health food. A survey was done on cacao production practices and level of knowledge of local farmers and the health conditions of the local community. A total of 50 cacao farmer respondents were surveyed for the identification of training needs in selected municipalities of Cotabato. Majority of the farmer-respondents identified the following as their training needs which include technologies on cacao harvest and post-harvest practices (21.88%), harvesting and postharvest handling practices (21.88%), management of insect pest and diseases (16.67%), and crop and farm maintenance (13.54%). To date, 20 cacao farmers in Kidapawan City were

trained for cacao production and were given with QPM. Also, 100 household members were surveyed for their health status and level of knowledge on cocoa as health food from Dagupan, Kabacan. Feedback of the survey results were shared to the community and about 60 household members were trained on the importance of cocoa product as health food in the areas of Dagupan, Kabacan, and Ginatilan, Kidapawan City.

Keywords: Covid-19, pandemic, training, quality planting material, tablea

10:50-11:10

403 – SWIPE-Solid Waste and Integrating Program for E-Waste Disposal

Maricel G. Dayaday, Fredelino A. Galleto, Saque Amilbahar

ABSTRACT. The Solid Waste Integrating Program for E-waste Disposal (SWIPED) is a comprehensive extension project of the College of Engineering and Information Technology (CEIT), University of Southern Mindanao, Kabacan, Cotabato. Barangay Poblacion, Kabacan, Cotabato is the service are of the extension project. SWIPED seeks to assist the barangay local government units (BLGU) in managing the increasing amount of solid waste generated by the community. It seeks to raise awareness of the target barangay on the impact of solid and e-waste. It also helps the barangay officials in crafting ordinances in relation to e-waste management and the purok leaders to capacitate on the usage of the available bottle shredder of the barangay. The project supports the overall goal of helping local communities achieve their sustainability goals through upskilling of barangay local government unit officials (BLGUs) and purok leaders. The SWIPED aims to: 1) Increase awareness of e-waste management among beneficiaries 2) Craft policy recommendations for E-waste management 3) Develop crafts and other arts from e-waste products, including how to de-solder metal products from e-wastes 4) Training on operations of bottle shredder machine 5) Adopt the use of bottle shredder machine in the community as a source of livelihood. SWIPED project has conducted the following activities such as: a) E-waste knowledge survey; b) Launching of SWIPED; c) Community Awareness on SWIPED d) Training on Disassembling of E-waste components and arts and crafts development e) Training on Operations of Bottle Shredder Machine f) Training on Solid Waste for Construction g) Crafting of barangay ordinance.

Keywords**:** Awareness, Bottle shredder, Construction, Electronics waste, Solid waste

11:10-11:30

404 – Tablea: Pangkabuhayan para sa kotabateñong Pamayanan A Community-based Tablea Production for Sustainable Livelihood in Cotabato

Ardniel A. Baladjay, Gwen Iris D. Empleo, Sheena B. Lucena, and Janice M. Bangoy

ABSTRACT. The COVID-19 pandemic negatively impacted the economic and agricultural sectors in the Philippines resulting in work displacement and loss of livelihood. These events opened opportunities to transform agriculture food systems including increased utilization of locally available food that would provide alternative sources of livelihood. Cacao (Theobroma cacao L.) is a highly valuable crop in the Philippine domestic and export markets. In Region 12, cacao production is projected to increase which provides opportunities for sustainable livelihood to Cotabateños. This one-year project funded by DOST-PCAARRD aimed to 1)

capacitate cacao farmers, tablea makers, and displaced workers in selected cacao growing municipalities of Cotabato on cacao pre- and post-harvest processing, tablea production, packaging, and marketing; 2) promote the mature technology on tablea production using USM practices for adoption; and 3) generate additional income for the beneficiaries. The USM Tablea Team, in coordination with the LGUs of Antipas, Tulunan, and Aleosan, Cotabato identified three associations of cacao farmers: Municipality of Antipas Kakao Growers Association, Inc. (MAKGAI), Aleosan Cacao Farmers Association (ACFA), and Tulunan Cacao Growers Association (TCGA). The respective association leaders facilitated the selection of ten members who underwent capacity building while the USM Tablea Project Team carried out the development of six training modules for various project activities. The Team was able to conduct on-site training using lecture-method demonstrations. An intervention was afforded through common facilities and equipment support to three associations to ensure continued tablea production in their respective locality and to sustain the supply to the target market.

Keywords: Cacao Farmers, Cacao Production, Community-Based Production, Sustainable Livelihood, Tablea

1:00-1:20

405 – Development of Video Materials on Organic Production of Indigenous Vegetables for Dissemination

Gelyn V. Amilbahar, Tamie C. Solpot, Josephine R. Migalbin

ABSTRACT. To address the new trend of today's society which strongly demands a new technology, Video materials in extension are very relevant especially in terms of technology transfer and information dissemination. This project served as a medium of Information dissemination of the University of Southern Mindanao, particularly from the College of Agriculture which aimed to informed the local communities or service areas of the University to help achieve self reliance towards indigenous vegetable production, ensure food security, and improve productivity of vegetables among local households and schools. On the other hand, Food security is a major concern not only in the Philippines but also to other countries. In order to alleviate the problem in food security, backyard farming is one of the technologies that can produce food under adverse condition and can be done at home with less effort. The main purpose of this project is to help alleviate the effects COVID-19 pandemic by showcasing indigenous organic vegetable garden model and video production on the utilization of the indigenous vegetables in the University of Southern Mindanao. The project has the following objectives, set up- a model garden for organic production of indigenous vegetable, develop at least 5 video materials in organic production of indigenous vegetable and, disseminate at least 5 video materials on site and social media platforms . The project paved the way to established a model garden that showcased indigenous vegetable like kadyos, native talong, Kangkong, native ampalaya, kulitis, alugbati, pulang kamote and saluyot . Moreover, the development of five (5) video materials were also done with five different contents namely; Nutritional Benefits of Indigenous Vegetable, Urban Gardening, Indigenous Vegetable Recipes, Model Garden for Indigenous Vegetable and Modified FPJ Concoction. Finally, Dissemination of the video materials were successfully done through its respective clienteles to which, it was rated as very informative and has a very satisfactory rating.

***Keywords*: Food Security, Information Dissemination, Indigenous Vegetable, Organic Production, Video Materials**

1:20-1:40

406 – Gender Research and Capability Building in Extension

Glyn G. Magbanua

1:40-2:00

407 – Community-based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal kagikit for Certification

Analyn A. Gonzales, Jeannie U. Duka, Lian D. Bagonoc, And Jay-R G. Vildac

ABSTRACT. The College of Business, Development Economics and Management through its extension and community services is guided by its mission for community development through advocacy, technology transfer, consultancy and other support services. Through the help of the CBDEM extension project of USM, the Community-Based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Kagikit for Certification, the Kayaga Women's Association will produce kagikit product for commercialization. The college believes that it has the economic advantage that will help both Maguindanaon and non-Maguindanaon entrepreneurs, investors, and advocates. The college conducted needs assessment and profiling of 25 beneficiaries, signed Memorandum of Agreement between Barangay Kayaga and USM-CBDEM, capacitated the partner community through technical training, and produced financial management training module. Through the help of the college, the partner community is now a certified association of the Department of Labor and Employment (DOLE). Moreover, the AgriBusiness Department spearheaded the product testing using the sensory evaluation criteria such as appearance, aroma, taste and texture, the research instrument employed a 9-point rating scale with 1 as the lowest and 9 as the highest. Overall, the general acceptability of the product was evaluated as "Like Extremely" by 115 respondents.

***Keywords*: Collaboration, development, economic, management, promotion**

2:00-2:20

408 – Development of Community Based Tourism in Kabacan, Cotabato

Meldred F. Samblaceno, Rosyell Angelo N. Piosca and Urduja G. Nacar

ABSTRACT. Community-based tourism (CBT) has been popular to many areas in the Philippines like Puerto Prinsesa, Palawan and Lake Sebu, South Cotabato. It underlines the involvement of local residents in the management and development of the community, on the environment, respecting their cultures and contributing to the economic and social well-beings of the host community. According to Lo and Janta, (2020), CBT aims to accomplish four goals: (1) resource conservation: preserving cultural and natural resources by having a positive impact

on the community; (2) socio-economic development: allowing the community to balance costs and benefits; (3) community empowerment and identity: strengthening community identity through meaningful activities that allow residents to own and recognize their local identity; and (4) high-quality visitor experiences. Kabacan, also known as the "source of abundance," is visited by many from neighboring towns for the Pisan caves, the University of Southern Mindanao, and the Kapagayan Festival. The project entitled “Development of Community-based Tourism in Kabacan, Cotabato” was intended to assist the community in the development of Community-based Tourism. Specifically, it aims to; produce promotional tools; organize and capacitate the target beneficiaries as Gabay Turista or University Guide; and to disseminate the promotional tools to varied stakeholders for assessment and critique. A permission letter on proposal presentation was sent twice to the office of the Mayor. The first letter dated April 21,2022 was sent to Mayor Herlo P. Guzman then, received but was not entertained due to election-related issues and change of administration. With the team’s determination, a permission letter was sent again to the newly-installed Mayor Evangeline P. Guzman, dated July 13,2022. After two weeks of waiting, the letter was finally endorsed to the LGU-Kabacan Administrator Ben Guzman and to the municipal tourism office. The proposal was initially presented last July 26, 2022 to Mr. Francis Merillana, the tourism-office in-charge. Memorandum of Agreement (MOU) was crafted and presented in a meeting with Mayor Evangeline P. Guzman, Administrator Ben Guzman, Rhosman S. Mamaluba, the OIC-Head, Tourism Office and Francis Merillana, the Tourism office staff, last November 17,2022. Suggestions from the LGU were incorporated on the specific responsibilities of both parties, such as the cultural mapping and museum management. A special meeting was also set for the final crafting of the MOU. Analysis of the tourism assets was also done to determine the strength, weakness, opportunities and threat (SWOT) of the tourism industry in Kabacan, Cotabato thru an interview with Rhosman S. Mamaluba, the OIC-Head, Tourism Office and Francis Merillana, the Tourism office staff, last October 21,2022. Findings revealed that the University of Southern Mindanao and Pisan Cave were the existing tourist attraction, while the fish landing center in Cuyapon, IP community, antique collections of the Mantawil Family, Pisan rock formations, crocodile sightings in Cuyapon, water hyacinths products and native delicacies were among the potential points of interest in the future. Available community-based tourism assets were also noticeable in the area, such as restaurants, check posts, bridges and roads, sunset and sunrise spots. Potential natural features were also enumerated such as varied landscape, forest and vegetation and river.

Keywords: instructional

2:20-2:40

409 - Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS Plans) (Phase 2: Facilitating Independent Learning and Teaching in the New Normal)

Leorence C. Tandog, Debbie Marie B. Verzosa, Philip Lester Benjamin, Daryl Mae Mamon, Anna Jean Garcia, Rowel Madio, Leonard Paleta, Roel Valenton and Florie Jane Tamon

ABSTRACT. Filipino learners perform poorly in international assessments in mathematics and literacy. The problem is exacerbated by the Covid19 pandemic which disrupted face-to-face classes starting 2020. Teachers expressed the need for training in developing materials for

blended learning. This extension project, which started on April 2022, aimed to utilize and validate print materials such as comic strips, activity sheets, and posters; and to capacitate teachers in developing appropriate materials which target foundational content knowledge in elementary, and mathematical knowledge in high school. An initial training was implemented on April 30, 2022 via Zoom, attended by 24 elementary and 87 high school teachers. Participants learned, about research-based teaching strategies, and were tasked to develop learning materials as part of a professional learning community. For elementary school, Fraction Comic Books developed during the first phase (in 2021) were validated by 20 teachers who found them to be accurate, logical, and appropriate for learners. Teachers also learned how to create picture books and math posters for teaching elementary school content. For high school mathematics, eight groups of ten members meet regularly online to develop and refine research lessons with one subject expert coming from the Department of Mathematics and Statistics. By the end of the year, two picture books and 10 math posters for elementary school, and 2 refined lesson guides for high school mathematics are expected to be completed. It is expected that these materials can be used even when regular face-to-face classes resume.

Keywords: instructional materials, lesson study, mathematics, picture books, professional learning community, teacher training

3:00-3:20

410 – "Inpograp ng mga Inpormasyon Hingil sa Omicron Variant para maiwasan ang pagkalat ng COVID-19 at ang Benepisyo ng Pagbabakuna: Isang Teknikal na Pagsasalin"

Radji A. Macatabon Normie G. Pabinal Sandra M. Paidomama Dyane Reah B. Bana-Ay Gemcarl Rufer Dyan B. Galang

ABSTRACT. Ang proyekto na ito ay pinamagatang "Infograp ng mga impormasyon hinggil sa omicron variant para maiwasan ang pagkalat ng covid-19 pandemya at benipisyo ng pagbabakuna: Isang Teknikal na pagsasalin." Ang proyekto na ito ay tungkol sa pagsasalin at pagbuo ng polyeto hinggil sa COVID-19 pandemya. Ang pangkalahatang layunin ng proyektong ito ay, maisalin at makabuo ng isang polyeto na naglalaman ng mga patnubay para maiwasan ang pagkalat ng COVID-19 pandemya na nakasalin sa wikang Blaan, Teduray, Maguindanawn, Erumanen ne Manuvu at Tagakaulo. Sinaklaw ng proyekto na ito ang paglilikom, pagsasalin at pagbuo ng polyeto bilang kagamitang impormasyon para maiwasan ang pagkalat ng COVID-19 pandemya at halaga ng bakuna. Ang proyekto ito ay may kuwalitatibong desinyo na kung saan ginamit na batayan sa pagsasalin ang Meaning-based translation ni Larson (1984) na nagpapahayag na sa pagsasalin mas mahalagang maisalin ang diwa at hindi ang salita. Ginamit din bilang dagdag na batayan sa pag-aaral na ito ang teoryang Skopos ni Hans Vermeer (1978) na nagsasabing mahalagang malaman ang layunin ng pagsasalin. Ang isang malinaw na pagpapatupad ng aksiyon ng pagsasalin ay pagkilos ng tao na naayon sa taglay na intensyon sa pagsasalin. Ang pagpapaandar ng isang pagsasalin ay nakasalalay sa kaalaman, mga inaasahan, halaga at pamantayan ng mga target na mambabasa na muling naiimpluwensyahan ng sitwasyong kanilang naroroon at ng kultura. Batay sa naging resulta ng proyekto, ito ay nakabuo ng mga polyeto, ang Teduray, Maguindanawn, Tagakaulo, Eremanen ne Menuvu at Blaan. Masasabing marami ring mga salita sa wikang Filipino na hindi matutumbasan sa mga nabanggit na wika. Ito'y isa sa mga karaniwang suliranin sa pagsasalin ng tekstong siyentipiko/teknikal na kung saan tinawag ni Mona Baker sa kanyang "In Other Words" (1992) na problem of non-equivalence: source language concept not lexicalized in the

target language na nangangahulugang ang teksto ay walang katumbas na salita sa tunguhang lengguwahe ang konsepto sa simulaang lengguwahe. Maaari ring magamit ang bernakular na wika sa paghahatid ng impormasyon hinggil sa pangkalusugan sa paraang lalong maunawaan ng maraming mamamayan.

Keywords: Polyeto, COVID-19, pandemya, teknikal na pagsasalin, Wikang Teduray, Magindanawn, Tagakaulo, Blaan at Erumanen ne Menuvu.

3:20-3:40

411 – Strengthening Functional Literacy through Interactive Video Lessons (IVL) in Barangay Cuyapon, Kabacan, Cotabato

Ellen Joy M. Farala, Faith P. Buned, Bailyn M. Mantawil, Jay G. Regulacion

ABSTRACT. Functional literacy is defined as the practical skill set required to read, write, and perform math for real-life purposes so people may function effectively in their community. The College of Education through its Literacy Numeracy in Barangay Cuyapon (LITNUMBARCU) in 2018 conducted series of activities to teach all age-groups from the community to help increase the literacy rate in the community. However, literacy rate in the community is still 5.55% among the persons surveyed aged 10 and above from 2017-2019 according to data from Municipal Planning and Development Council Office. This project was proposed to strengthen the functional literacy rates of school-aged children in the community from Kindergarten to High School. Profiling of respondents was done among 72 learners. Results revealed that biggest percentages of students struggled in the subjects English, Filipino, and Math, with 36.11%, 45.83%, and 37.5%, respectively. Series of basic reading activities were conducted every Friday afternoon using Science Research Associate (SRA) and Marungko approach in reading via face-to-face teaching. Post-test results revealed that learners improved 1 step higher from being unable to recognize letters to beginners in early grades (blending of sounds up to reading simple phrases) and beginners to developing readers from Grades 6-10 (Reading and comprehending short stories) in terms of reading and comprehension. Positive feedback coming from the participants, including their parents, was also gathered. The college is committed to continue its efforts to help the community reach its maximum functional literacy and will include adult learners as additional participants.

Keywords: Functional literacy, SRA, Marungko Approach,reading comprehension

3:40-4:00

412 – CTI Capacity Building for Barangay Pisan: Pinning Intellectual Skills and New-Tech (PISan)

JP E. Fortinez and Rene C. Cabahug Jr.

ABSTRACT. This project "CTI Capacity Building for Brgy PISAN: **P**inning **I**ntellectual **S**kills **a**nd **N**ew-tech" or simply "PISaN project" intends to deliver technical services and empowerment to the Barangay Pisan community supposedly from January 1, 2022 to December 31, 2022 through three components. The first component focuses on capability building with skills training in defensive driving and welding and fabrication, and empowerment via a values strengthening seminar. The second component focuses on the skills

assessment wherein the selected beneficiaries showcase their skills learned through a return demonstration and possibly a functional fabricated product. The third component focuses on community engagement in livelihood opportunities through services and product display. PISaN project's extension methodology is categorized into pre-implementation activities, implementation activities, and post-implementation activities. Currently, social preparation, specifically coordination and consultation with the community leaders as part of the pre-implementation activities has been conducted. Since all three components are yet to be implemented, catch-up plans are prepared to be executed in the first half of 2023.

Keywords: Capability Building, Skills Training, Defensive Driving, Welding, Fabrication

8:40-9:00

113 - Potential Use of BCA, Bio-stimulants and Water Management in Diseases of Dragon Fruit

Jasmin Pecho and Tito Jun T. Tidula

ABSTRACT. Potential Use of BCA, Bio-stimulants and Water Management in Diseases of Dragon Fruit Jasmin A. Pecho and Tito Jun T. Tidula Continuously increased planted area of dragon fruits (*Hylocereus undatus*) indicates great potential as a commercial crop. Fruit production is a promising means, especially with proper water management, of raising the income of farmers in the Philippines. However, dragon fruit diseases specifically canker caused by the fungus *Neocytalidium dimidiatum* may hinder production and in worse cases entirely wipe out the plantation. Therefore, this study is conducted to determine the effects of BCA with bio-stimulants to minimize disease incidence and water management on the growth and yield of dragon fruit. Dragon fruits planted at the CA-SDC-USMARDC were utilized to conduct this study. The soil texture of the location was determined using the sieve analysis while soil characteristics specifically the field capacity using SPAW. Due to the heavy rainfall, the study area experienced waterlogging which greatly affect the growth and evenly caused the death of affected plants. Thus, proper drainage improved crop status and even prevent the further possible spread of disease carried by surface runoff.

Keywords**:** bca, bio-stimulants, dragon fruit, *Neocytalidium dimidiatum*, water management

9:00-9:20

114 - Trait Enhancement of USM Varieties and Family Selections with Herbicide and Corn Borer Resistance

Efren E. Magulama, Jessie G. Elarde, Ferdinand A. Duldulao and Marry Grace S. Balbuena

ABSTRACT. The project generally aimed to enhance the selected USM varieties and families with glyphosate and corn borer resistance traits with specific objectives of (1) to validate the yield potential and herbicide resistance of USM varietal hybrids, (2) to select promising advance lines with resistance to herbicide and corn borer from the segregating population of maize, (3). to improve the parental lines of USM var 33 and 35 with herbicide resistance trait, and (4) to establish DNA fingerprint of USM var 33 and 35 which serve as molecular identity. The four component studies of the project are still on-going. In study 1, the three varietal hybrids were formed, and they are currently being evaluated for yield test. For screening of glyphosate tolerance, all the varietal crosses showed 99% plant survival 14 days after glyphosate application. For study 2, 512 S5 ears were generated from five population sources. In study 3, six BC1F1 backcross populations were formed and the six BC2F1 populations are currently being formed. For study 4, molecular markers for USM var 33 and 35 are currently being screened for parental identity.

Keywords**:** corn borer, herbicide, maize, SSR makers and varieties

9:20-9:40

115 - Use of the Triple Crop System in Enhancing Resource Use Efficiency and Crop Productivity in Corn

Baser L. Mamalac, Efren E. Magulama and Nenita E. Olero

ABSTRACT. The corn-based intercropping system is one of the strategies that can help small-scale farmers to maximize yield productivity and profitability. The project is conducted specifically to determine suitable companion crops for corn in a triple crop system, identify suitable genotypes of companion crops in a triple crop system, establish sowing dates of companion crops of corn in a triple crop system, and evaluate the productivity and economic profitability of triple crop system. All project components are still ongoing. The experiment was carried out in a randomized complete block design with three replications. For treatments, component 1 consisted of six kinds of crop combinations and the sole crop of each companion crop. For component 2, the treatments were composed of two varieties of each companion crop for the crop combinations while for component 3, the treatments were composed of seven sowing dates of companion crops. Initial data on growth and yield parameters were already gathered particularly for corn and string beans.

***Keywords*: Triple crop system, companion crops, sowing dates, resource use efficiency, crop productivity**

9:40-10:00

116 - Prevalence and Molecular Characterization of Gastrointestinal Parasites in Human-macaque Interface: the case of Hindang, Leyte and New Israel, Makilala, North Cotabato

Lothy F. Casim, Leanne Jay S. Manceras, Cyrelle M. Besana, Fritzie S. Sia, and Augustus Oer V. Silapan

ABSTRACT. This study aims to investigate the occurrence of gastrointestinal parasites (GIT) in the human-macaque interface of New Israel, Makilala, and Hindang, Leyte, using a One Health approach. The prevalence and intensity of parasites in long-tailed macaques, residents, and the environment were investigated by means of non-invasive parasitological techniques. The study also determined the associated risk factors and the possible cross-transmission of parasites using conventional and molecular techniques. In Leyte, an overall prevalence of 100% for gastrointestinal parasites was obtained in both macaque troops. Parasites identified include nine (9) protozoans (*Balantidium coli*, *Blastocystis* spp., *Endolimax nana*, *Entamoeba coli, Entamoeba hartmanni, Entamoeba histolytica*/dispar, *Entamoeba polecki, Iodamoeba butschlii*, and *Isospora* sp.) and one (1) helminth (hookworm). In New Israel, a total prevalence rate of 98.33% was recorded. All protozoans detected in Leyte (except *Isospora* sp.) were also observed in macaque fecal samples from New Israel. However, there were 3 additional helminths found, these are *Ascaris lumbricoides, Strongyloides* spp., and *Trichuris trichiura*. Protozoans had the highest intensity and prevalence observed in both sampling areas. Analysis of the water samples revealed that there were two (2) sites contaminated with parasites (*Balantidium coli*, *Blastocystis* sp., & *Iodamoeba butschlii*) in New Israel. However, no parasites were detected in environmental samples from Leyte. With regards to human fecal samples, 5.3% and 7.3% were infected with gastrointestinal parasites in Leyte and New Israel,

respectively. Species recovered from human samples were *Ascaris lumbricoides*, hookworm, and *Entamoeba coli*. Moreover, analysis of the association between the sociodemographic & KAP of participants to the GIT prevalence identified 8 variables that were significantly associated (p= <0.05) with the occurrence of the parasitic infection in both areas. In addition, the team conducted data dissemination, awareness campaign, and policy formulation with LGUs & local constituents regarding macaque management, conservation and public health protection.

***Keywords*: gastrointestinal parasites, humans, KAP, macaques, prevalence**

10:20-10:40

117 - Assessment of Wildlife Encounters, Rescue and Training in Protected Biodiversity Landscapes of North Cotabato

Florence Roy P. Salvaña

ABSTRACT. Understanding processes like encounters, rescue and trading is an important aspect of holistic wildlife conservation. This study was conducted to assess wildlife encounters, rescue and trading in protected biodiversity landscapes of North Cotabato. A study presentation was conducted in the 1st quarterly meeting of PAMB-MANP to secure necessary permit. A survey was conducted to DENR, PENRO and CENRO- Matalam to gather information on the recorded encounter, rescue and trading of wildlife species. Records from these offices were also accessed to determine which wildlife species are commonly encountered, recued and traded. Most the encountered and rescue wildlife species are birds from 2020-2021. Other recorded wildlife species include flying foxes, Philippine tarsier and snakes. Poaching and trading of wildlife species were also recorded. Flying foxes and birds were commonly poached and traded wildlife species. Wildlife encounters and rescue were recorded in Kidapawan, Arakan, Magpet, Matalam and Mlang which are part of protected landscapes such as Mt. Apo Natural Park (MANP), Mt. Sinaka and Ligawasan Marsh Bird and Wildlife Sanctuary. Preliminary data gathered and encounters and rescue in Libungan-Alamada Natural Biotic Area (LANBA), Banisilan and Kabacan include 2 species of hornbill, 1 individual pythons, 2 individual grass owls, 2 monitor lizards, two, 2 species of flying foxes (with greater concentration in Banisilan), 2 juvenile herons and 2 raptors (Brahminy Kite & Pinsker's Hawk Eagle) and 1 tarsier from 2019-2022. Most of the common traded wildlife species include bats and wild boars in Kabacan in Banisilan, and deers and avian species in LANBA based on the information given by CENRO personnel.

***Keywords*:** wildlife, encounter, rescue, trading, biodiversity

10:40-11:00

118 - Project 4. Disease Profile in Rubber-based Farming System in Southern Philippines

Joan P. Sadoral, Purificacion O. Cahatian, and Armando G. Valiente

ABSTRACT. A study was conducted to assess and identify diseases of rubber and intercrops; and to compare disease profiles of different rubber-based cropping systems at Australian Centre for International Agricultural Research (ACIAR) experimental area, University of

Southern Mindanao Agricultural Research and Development Center (USMARDC), Kabacan, Cotabato from February 2020 to January 2022. Disease assessments for rubber and perennial intercrops (banana, lanzones, coffee and cacao), annuals such as cassava and eggplant, corn and mungbean were carried-out at four, two- and one-week interval, respectively. Results of the study showed that across different cropping systems (rubber + banana + annuals; rubber + lanzones + annuals; rubber + cacao + annuals; rubber + coffee + annuals; rubber mono + annuals) the most prevalent disease affecting rubber was bird's eye spot. The disease was noted to occur starting three months after field planting (MAFP) up until 26 months. Other diseases were also found to occur in the area like algal leaf spot, powdery mildew, wrikle spot-like disease, leaf blight, leaf spot, leaf fall and stem disease. Moreover, perennial intercrops were affected with the occurrence leaf diseases such as black sigatoka, freckle and cordana in banana; leaf blight in lanzones; algal spot, anthracnose, and rust in coffee; leaf spot/blight and vascular streak dieback (VSD) in cacao. Leaf diseases were also found to infect annual intercrops such as cassava, eggplant, corn and mungbean. Keywords: disease assessment, disease identification, crop diversification, management approaches

Keywords: disease assessment, disease identification, crop diversification, management approaches

11:00-11:20

119– CornLai: USM Agri-based initiatives in Food Security During Pandemic Crisis

Jeannie Duka, Maribelle Piamonte, Nenita Olero, Efren Magulama, Renel Alucilja

ABSTRACT. The study was conducted to promote glutinous white corn and adlai as alternatives to rice consumption to address food security during the pandemic crisis. The study will address food security and nutritious food access in times of pandemic crisis, maximize the land area for corn production through backyard gardening, and provide livelihood opportunities for the local communities. USM agri-based initiatives in this project included the production of corn and adlai, and innovation of food products from these cereals. IEC materials were developed on corn production and cereal preparation for consumption. Glutinous corn seeds and IEC materials were distributed to 200 farmers in North Cotabato during the pandemic for backyard garden production. A model small-scale irrigation solar system was developed to demonstrate the increase in yield of corn in backyard production in conditions where water source is deficient due to climate change. Germplasm collections of adai in this study for seed generation were ginampay, gulian, kiboa, pulot and tapol varieties, and the agro-morphological traits of these varieties were described. Data were collected on the awareness and acceptance of the community in North Cotabato on adlai production and corn-based food products. Majority of the respondents were not aware and had not tasted the adlai, however, they are willing to consume adlai and corn-based products (CornLai). Furthermore, this project had developed adlai-based and corn-based products such as adlai beverage and Adlai patil.

Keywords: acceptability, awareness, CornLai, food security, Germplasm, solar irrigation system

11:20-11:40

120 – "MECO-TECO" Joint Research Project: Improvement of Carabao Mango Production and Fruit Quality through Quantitative Trait Loci (QTL) Identification for Scab and Stem-End Rot Resistance by Genome Wide Association Studies (GWAS)

Edward A. Barlaan, Joan P. Sadoral, Joellee L. Aguirre and Jaried B. Vergara

ABSTRACT.
Mango fruit production and marketability are adversely affected by fruit diseases like stem-end rot and scab. The study aimed to generate molecular markers associated with scab and stem-end rot resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utilization in marker-assisted breeding in 'Carabao' mango. Different mango accessions were tagged and evaluated for their resistance to stem-end rot and scab disease. Twenty-seven 'Carabao' mango varieties were inoculated with causal pathogen of stem-end rot disease and assessed based on the degree of infection. All 'Carabao' mango varieties were susceptible to stem-end rot disease. For scab, attempts were made for isolation, inoculation, infection of causal pathogen, and evaluation of mango varieties for resistance. Development and design of molecular markers was done as an option to detect *Elsinoe mangiferae* (causal pathogen of scab disease) in leaf samples. Forward and reverse molecular markers were developed and validated using subcultures of suspected E. mangiferae isolated from leaf samples affected by scab disease. In addition, in situ inoculation was done as an alternative option for evaluation of resistance against scab disease. Twenty-one 'Carabao' mango varieties were grafted and used as samples for in situ evaluation of resistance against scab disease. Alternatively, evaluation of resistance against scab disease on 'Carabao' mango varieties was done under natural field conditions. Twenty-one 'Carabao' mango varieties were evaluated for its resistance against scab disease. Results revealed that all 'Carabao' mango varieties were susceptible to scab disease. DNAs of 69 'Carabao' mango accessions were extracted, purified and quantified for GBS library construction and bioinformatics analysis.

Keywords: Mango, Genotyping-by-sequencing, Genome Wide Association Studies, Stem-end rot

11:40-12:00

121 - Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genom-wide Association Studies (GWAS)

Edward A. Barlaan, Joellee L. Aguirre, Jaried B. Vergara and Evelyn Alejandro

ABSTRACT. Mango production in the Philippines is constrained by post-harvest diseases affecting fruit quality and yield. These diseases include stem-end rot (SER) caused by *Lasiodiplodia theobromae* and scab caused by *Elsinoe mangiferae*. There is a need to identify sources of resistance to these pathogens from various mango strains, cultivars and varieties to improve the Philippine 'Carabao' mango for resistance to SER and mango scab. The study aimed to isolate and molecularly identify the causal pathogens and develop molecular markers associated with scab and SER resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utility in marker-assisted selection/breeding. Besides 'Carabao' mango, other mango cultivars were used as potential source of resistance to SER. One-hundred one other mango cultivar trees were tagged for molecular analysis. Eighty-two mango fruits derived from Guimaras and Regions X, XI and XII were inoculated in vivo

with stem-end rot. Two mango cultivars were identified resistant to SER, namely, Huani and Irwin. Since the claimed causal pathogen of scab, *E. mangiferae*, could not be proven or reproduced, reactions to scab among mango cultivars were assessed based on field or natural conditions. Of the fifty-two mango cultivars evaluated, one cultivar showed resistance to scab. Alternatively, efforts were exerted to identify potential causal pathogen of mango scab. Fungal isolates were obtained from the typical symptoms of scab for morphological characterization, molecular identification and pathogenicity tests. A total of eighteen prospective mango scab isolates were molecularly identified. Pathogenicity tests on leaves for these isolates are still in progress.

Keywords**:** Genotyping-by-Sequencing, Genome Wide Association Studies, Mango, Stem-end rot, Scab

8:40-9:00

213 - Production, Commercialization & Technology Transfer of Kuliva Ice Cream

Leila S. Moscoso, Ardniel A. Baladjay, Ian Jade A. Flores, Avagale S. Roy

ABSTRACT. The Kuliva Ice Cream was tested for consumer preferences by 300 panel of evaluators. Thirty four percent (34%) preferred to eat the ice cream very often , almost 26% would like to eat this now and then , while 1.8% would like to frequently eat the said product. The original design of the label was revised from on "ice cream bar" to a "scooped ice cream" to make it more enticing. Initial product marketing was done during the Techno forum Exhibit at the USM Commercial building. As part of the 68th founding anniversary. Per serving of the ice cream contributes around 15% of the individual's daily need for Calcium, 25% for Vitamin A, and 14% for Vitamin C.

***Keywords*:** Ice Cream, Kulitis, Sensory Quality, Stabilizer, Nutritional Value.

9:00-9:20

214 - Development of Rice Topping Product- ''kagikit'' –From Chicken Meat

Julius Jerome G. Ele, Elma G. Sepelagio, and Jalaloden B. Marohom

ABSTRACT. "Kagikit" is a Maguindanaoan word used to describe sumptuous marinated chicken flakes that serve as the toppings of pastil. Chicken meat is considered as a primarily source in making "Kagikit". The study is being conducted to evaluate the chicken meat in making "Kagikit" from the different types of chicken meat available in the market which are broiler, cull, native, and Paraoakan-cross. Moreover, different cooking oils were also utilized including canola oil, corn oil, palm oil, and vegetable oil in making the "Kagikit". Furthermore, the different methods of preparation including flaking, shredding, grinding, and chopping was done. The "Kagikit" products were evaluated and a 5-point hedonic scale was used to determine the acceptance rating for appearance, color, flavor, juiciness, aroma, texture, and tenderness. The sensory evaluation results are being analyzed using a Kruskal-Wallis test with 30 board of tasters as evaluators. The "Kagikit" was evaluated based on the standard microbiological assay done in chicken meat. A total of 12 treatments were subjected to microbial evaluation namely total plate count, yeast and mold count, Total coliform count, Escherichia coli, and Salmonella detection using the Bacteriological Analytical Manual protocols. The laboratory test was conducted at the USM-CAS BIODEP water testing laboratory. The survey was done to random individuals from the three Municipalities in North Cotabato (Midsayap, Kabacan, and Kidapawan City) to determine the market and willingness to pay of consumers of the product "kagikit". Four different label designs were made and evaluated by the respondents. The four label designs were submitted for registration to the IPO-Phil. through the IPTBM office. Statistical analysis will be done using Descriptive and MRA. The production cost of the product "Kagikit" will be computed to determine the price allotted to the product.

Keywords: chicken, kagikit, microbiological assay, respondents, sensory evaluation, survey

9:20-9:40

215 - Processing and Packaging of Chevon Products

Ivy Mar B. Cabornida, Maribelle T. Piamonte, Ian Jade A. Flores, Lowie Jay P. Garino

ABSTRACT. Goats play a major role as a source of food and income. They have a very important role in meat consumption around the world, since goat's meat (chevon) is particularly healthy, nutritious and is exceptionally low in calories compared to other meats. Processing will add value and improve their quality and functionality for their intended use, however, currently, no existing food processors of chevon in Region 12 and only few processed chevon products were developed but not yet commercialized. Hence, developing more convenience chevon meat products for wider market niche is necessary so consumers can be offered with variety of choices for their lifestyle. The development was conducted in three stages: screening & formulation, quality evaluation and initial shelf-life study. Three (3) different chevon products were developed: Ready-to-eat (RTE) chevon tocino, chevon meat floss and chevon chicharon. These products were assessed to have a "like very much" sensory acceptability level of 7.83 - 8.30 by a panel of 30 evaluators using the 9-point hedonic scale rating. Moreover, the RTE chevon tocino packed in vacuumable polythene bag as primary packaging and placed in brown kraft bag had a pH of 5.46-5.55, TSS of 7-10˚Bx and water activity of 0.73-0.77; Chevon meat floss packed in half window brown kraft bag had a pH of 5.59-5.72, TSS of 13.2-14˚Bx and water activity of 0.63-0.66 and Chevon chicharon packed in the full window brown kraft bag had a pH of 7.24-7.29, TSS of 0.4-1.2˚Bx and water activity of 0.64-0.67. The packaged chevon products had initial shelf-life of about a month under ambient condition with acceptable microbial properties in terms of aerobic plate count and yeast and mold count.

Keywords: Chevon, Packaging, Processing, Sensory, Shelf-life

9:40-10:00

216 – Development of Diversified Products and Smart Packaging for Tinahito Brand of Smoked Catfish (*Clarias Gariepinus*)

Pia Amabelle M. Flores, Maricel G. Dayaday, Fredelino A. Galleto

ABSTRACT. The present study aims to improve smoked catfish (Clarias gariepinus) through product diversification and smart packaging. This is to address previous feedback in the product form and appearance to cater to wider scope of market segment. Diversified products were already developed including vacuum- packed products for smoked dried catfish in whole and filleted form as well as smoked fried catfish in whole and filleted form. Data on sensory evaluation followed complete randomized design and analyzed by using one-way analysis of variance. Tukey's test was used to compare differences at $p<0.05$ significance level. Findings indicate that packaging significantly affected appearance and general acceptability of the product ($p<0.05$). Vacuum- packed smoked whole catfish was significantly appealing compared to vacuum- packed fillet with bones, although it seems to be comparable with vacuum- packed fillet smoked catfish. Results in the general acceptability of the product indicated vacuum- packed smoked whole catfish significantly showed higher mean rating in terms of acceptability compared to both vacuum- packed fillet and vacuum- packed fillet with bones. Three smart- packaging prototypes were developed. Prototype 2 showed fastest heating

of frozen smoked fish at 5 minutes. From this study, improvements are still recommended for the developed smart- packaging prototypes.

Keywords: *Clarias gariepinus*, Diversified Products, Smart Packaging, Smoked catfish, TinaHITO

10:20-10:40

217– Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables

Joseph O. Castillo, Queennie L. Rufino, Elaine Genevive B. Parcon and Naomi G. Tangonan

ABSTRACT. M This study aims to provide essential data that will support sustainable organic vegetable production. This work would also facilitate the sharing of new results on efficient organic management strategies against insect pests and diseases associated with three solanaceous vegetables without compromising soil fertility and plant health in producing pesticide-free harvests. In an assessment carried out on eggplant, sweet pepper, and tomato field trials, different levels of disease infection and pest infestation were noted. In three months application of different fermented tea (FT) formulations with frequency of seven days, significant responses were observed on treated plants. On eggplant, *Cercospora* leaf spot disease was observed comparable (13.33-15.55 %) with synthetic check at 9.62 % severity. *Phomopsis* fruit rot disease was also noted to have similar results ranging from 8.88-13.33% comparable with the synthetic check with 4.44 % disease severity. In terms of insect pests, significant damages of *Epilachna* larvae (12.22- 35.55 %) and shoot borer (17.78- 24.44 %) were observed. Treatments showed comparable effects on the degree of damages of some FT formulations as compared to the synthetic-treated ones. FT formulations such as on FT1 (1.08 kg/plant) and FT3 (1.09 kg/ plant) also showed comparable effects on yield with commercially available synthetic fertilizer (1.05 – 1.71kg/plant). In case of sweet pepper, disease severity of *Sclerotium* wilt was comparable among treatment means but was least observed on FT-treatment 3 with 5.5 %. Anthracnose disease showed different reactions towards treatment means that ranged from 12 % - 33.00 % where chemical check had the least infection followed by FT treatment 3 with 15.55 % severity. Number of fruit borer infested at harvest was comparable among treatment means which ranged from 1.53 -1.67 fruits/ plant where synthetic fungicide has common mean with FT treatment 3 of 1.53 fruits/plant. Weight (kg) of harvest was comparable among treatment means which ranged from 0.750 – 0.980 kg/ plant where untreated control obtained the least fruits. The same assessment was done on tomato plants where early blight and bacterial wilt were the most damaging diseases observed during the time. Early blight disease was less (5.92) observed on synthetic fungicide-treated plants and highest on untreated ones (24.44 %). Bacterial wilt infection was high which ranged from 13.33 % obtained from FT treatment 3 to 43.33 % severity from untreated control. Tomato fruit borer was noted as the most visible and destructive at harvest. The most number of damages was obtained from untreated control with average mean of 3.20 fruits/ plant and the least were obtained from FT treatment 1 and synthetic fungicide with common mean of 1.20 fruits/plant. Harvest (kg/plant) also showed significant difference among treatment means where the heaviest was obtained from synthetic fertilizer-treated plants with 0.960 kg/ plant comparable with the FT treatments 1 and 2 with 0.718 kg and 0.730 kg/ plant, respectively. The above results will be validated by several analyses such as soil and tissue analysis (pH, organic matter, nitrogen, phosphorous, potassium) and mineral analysis for fermented teas (Micro: Cu, Mn, Fe, Zn and Macro: Na, Ca, K, Mg, N components, and Phytotoxicity) which are still underway.

10:40-11:00

218 – National Cooperative Test of Rice at USM

Nenita E. Olero and Joanne E. Duran

ABSTRACT. USM is one of the collaborators of the National Cooperative Test for rice aimed to help identify the best and most adapted promising line for hybrid and inbred, determine the distinctness, uniformity, and stability of advanced promising lines, and recommend elite rice lines to the National Seed Industry Council (NSIC) for varietal release. The result of the 2021 wet season trial in hybrid, Entry No. 10 with an average yield of 7,302.94 kg/ha out yielded the two check varieties (Mestiso 6 and Mestiso 103) with a yield advantage of 9.47% and 15.41%. For Group II, Entry No. 19 obtained a yield of 6,296.64 kg/ha which was significantly lower than Mestiso 99 with an average of 7,086.00 kg/ha. The result for the 2022 dry season trial revealed that none of the hybrids tested were comparable to the check varieties both for Group I and Group II. For the inbred trial results in 2021 wet season transplanted rice, an average yield of entries ranged from 3032.14 kg/ha to 6768.90 kg/ha. The top two highest yielders were Entry No. 1 and Entry No. 3 out yielded the local check variety (PSB Rc 18) with 18.01% and 4.46% yield advantage, respectively. In the direct seeded trial, Entry No. 1 obtained the highest yield of 5165.83 kg/ha which was significantly better than NSIC Rc 298. In the 2022 dry season trial for transplanted rice, none of the inbred tested were comparable to the check varieties. The yield ranged from 2399.20 kg/ha to 3600.59 kg/ha was significantly lower than the check varieties. In the direct seeded trial, among the five inbred tested, Entry No. 4 got the highest yield of 4796.70 followed by Entry No. 8 (4547.14 kg/ha) which was significantly better than NSIC Rc 402 with an average yield of 4291.77 kg/ha.

Keywords: distinctness, elite rice lines, inbred, hybrid, uniformity

11:00-11:20

219 – Optimization of Irrigation Flow Through Conduit Microhydropower to Generate Electricity for Off-grid Barangay of Kabacan, Cotabato

Marilyn S. Painagan-Calub, Tito Jun T. Tidula, Benhamin I. Mamalo, and Jonnah Mae A. Casalan

ABSTRACT. The University of Southern Mindanao and the Barangay Pisan of the Municipality of Kabacan have been working together since 2015 to promote human and institutional empowerment and development. This project intends to establish a locally fabricated low-cost micro hydropower system that will generate a 15-20 kW of electricity, which is potential enough to electrify the community at Sitio Silangan, Barangay Pisan. For the design of the system, a prototype will be developed, tested and evaluated before optimization. The process of optimization should be done in several iterations. The design of the micro hydropower system is based on the characteristics of the flowing water, the amount of kinetic energy of the flowing water as well as the head and discharge rate of the water source. The project has been started last October 01, 2022, and currently the Project Procurement Management Plan, Project Line-Item Budget, and Purchase Request has been prepared and

submitted for approval. The Project leader and staffs have already conducted the Focus Group Discussion (FGD) to discuss the directions of the project.

Keywords**:** discharge, efficient, prototype, turbine, water-flow

8:40-9:00

314 – Establishment and Conservation of Indigenous Tropical Fruit Crops in the University of Southern Mindanao

Nenita E. Olero, Jessie G. Elarde, Rezin G. Cabantug & Nancy E. Duque

ABSTRACT. Indigenous fruits nowadays can be found in limited areas, rural backyards are getting extinct due to their low popularity and having not so desired taste as compared to their local and imported fruit counterparts. The expansion of large industrial crops which have higher economic value lead to the cutting of some indigenous fruit crops. Considering its medicinal and nutritional value, the need to establish genetic conservation of germplasm is imperative for future scientific research. The objectives of this project are to collect and preserved indigenous tropical fruit crops either of seed origin, variety/clone for identification, morphological characterization; to establish and maintain gene bank for these crops at USMARD Center; and establish nursery and develop propagation techniques. The project has able to collect 24 indigenous tropical fruit crops namely: Verba, Batuan, Katmon, Dao, Libas, Bignay, Purple guava, Star apple, Durain Cacao, Marang, Jackfruit, Guyabano, Atis, Makopa, Atemoya, Sugar apple, Black sapote, Duhat, Sampalok, Star fruit, Kamias, and Inyam from the nursery of the Department of Environment and Natural Resources (4), Department of Agriculture (8), Tupi Seed Farm (4) and six (6) from the backyard of various farmers. There are 489 indigenous plants identified and tagged from among the 28 types of indigenous fruits crops in the province. Cotton candy berries (Aratilis) were the most common with 22.52%, marang 9.90%, Makopa 7.43%, jackfruit and star apple of 6.68%. Results on the clonal propagation of indigenous tropical fruits through cuttings showed no survival for Batuan two months after treatment of plant growth regulators. Bignai on the other hand showed promising results.

Keywords: indigenous, extinct, conservation, genebank, germplasm

9:00-9:20

315- Establishment of Mango and Banana Germplasm for Conservation, Characterization, and Utilization

Sheena B. Lucena and Edward A. Barlaan

ABSTRACT. Mango and banana are important Philippine economic crops due to the demand in local and international market. There is a need to establish a germplasm collection of mango and banana in USM to provide genetic resources needed for varietal improvement and preservation or conservation from genetic erosion or extinction. This study aimed to establish germplasm for mango and banana for conservation and characterization of different cultivars/accession for future utilization. A total of 44 mango accessions were collected and planted in the field of USM Agricultural. Research and Development (USMARD) Center. These accessions were collected from Guimaras and different areas in North Cotabato and Davao region. Further, 25 were classified as non-carabao and 19 were classified as carabao varieties. Information on their different characteristics was also recorded. Some cultivars had already reached the flowering stage. For bananas, a total of 54 cultivars/accessions were

collected from BPI-Davao City and different municipalities in North Cotabato and were planted in USMARD Center. These comprised accessions from the Philippines, Malaysia, Indonesia Thailand, Taiwan, and ITC-Belgium, which were classified into short, medium and tall categories. Data on flowering characteristics, fruit qualities, and other horticultural characteristics were documented.

Keywords: banana, cultivars, germplasm, mango

9:20-9:40

316 - University of Southern Mindanao Futures Thinking for Food Security, Systems, Innovations and Sustainability

Francisco Gil N. Garcia, Edward A. Barlaan and Ma. Teodora N. Cabasan

ABSTRACT. Futures thinking is a future-oriented mindset through a systematic method of exploring alternative futures. It enables people to be future-ready for possible scenarios and improves the quality of decisions to be more strategic and far-sighted. There is a need to capacitate the manpower in various entities in the Philippines to practice Futures Thinking ideas in different fields. In support to government initiative on Futures Thinking, Region 12 State Universities and Colleges (SUCs) Futures Consortium was established, which is spearheaded by University of Southern Mindanao (USM). The capacity building workshop on High Level Anticipatory Leadership and Governance Executive was conducted for SUC leaders and administrators in partnership with the Senate Committee on Sustainable Development Goals (SDG). The consortium constitutes five SUCs, which include Sultan Kudarat State University, Cotabato Foundation College of Science and Technology, Cotabato State University, South Cotabato State College, and USM. The consortium agreed to focus on Halal Futures in Region 12 considering niches of individual SUC for Halal R&D particularly on Halal goat, feed production, fishes, poultry, ruminants, and organic fertilizer. For USM Futures, previously approved research, development and extension (RDE) projects were implemented and monitored. In addition, the Futures Thinking team generated new Futures Thinking-related RDE proposals for evaluation and implementation. These are aligned to food futures for food security, innovations and sustainability dealing with cereals, protein source, high value crops and halal. Further, a workshop for the College of Medicine and health practitioners will be conducted to align the curriculum and goals to the Universal Health Care and SDGs of the Philippines.

Keywords: Futures thinking, innovations, food security, sustainable development goals
9:40-10:00

317 - Organizational Interventions on Halal Certification Systems towards Product Internalization

Abubakar A. Murray, Frederick John B. Navarro, Nerissa G. Dela Viña, Deinmark L. Antes, Leila S. Moscoso, Ray-Hannah Makakena

ABSTRACT. This paper presents of the organizational performances of stakeholders in implementing RA 10817 towards halal certification and internationalization. It aims to determine the gaps among stakeholders on the Halal Certification System towards food product exportation. Interviews and surveys were conducted among the stakeholders such as the local

government units (LGU), regional government agencies, Halal certifiers, food manufacturers, and consumers in Cotabato province. Data were consolidated from the collected primary and secondary data to determine the practices, gaps, and plans. Three populous municipalities/ cities in Cotabato province: Kidapawan, Pikit, and Midsayap. RA10817 identified the roes and functions of each halal certification agencies and stakeholders. In 5-years of Halal law implementation, new offices in LGU have been established to support business promotion and tourism. However, the identified scope and function were not explicit to Halal food promotion. Some of the local agencies have strengthen Halal law sponsoring bills for Halal food systems. Most of the government agencies were active in education, training, and promotion of Halal among SMEs. Large scale food manufacturers have secured international Halal certification, while least number of SMEs were aiming for Halal certification. The response of consumers eating habit for Halal food were identified to understand more drivers of change to Halal certification system. The results of the normal group technique (NGT) from the four stakeholders obtained top priority issues. Common challenges were documented in this project which includes a low-to-no response from stakeholders, difficulty with transportation, and health, election, and security related restrictions.

Keywords: Food products, Halal stakeholders, Halal policy, Cotabato province, Gap analysis

10:20-10:40

318 - Development of e-LET Intervention program for Professional Education

Dyane Rhea B. Bana-ay, Ellen Joy M. Farala, Jean M. Millare

ABSTRACT. Based on a five-year performance of schools data (2015-2019) by PRC, USM-Elementary consistently performed lower (17.02%) than the national passing rate (27.90%). In addition, USM-Secondary performed lower (33.78%) in September 2019 compared to the national passing (39.68%). In order to improve the board exam preparation of its graduates, an e-LET system for professional education courses was developed. Performance of CED graduates categorized based on thinking levels was determined through a series of pre-board exams in Professional Education courses. Results showed that on average, the graduates scored the lowest in Apply (33%), Evaluate (47%), Understand-Categorizing (49%), and Analyze-Differentiating (49%) test items. In terms of subject areas, the most difficult include Developmental Reading (38%), Assessment of Student Learning (39%), and Curriculum Development (40%). To improve the psychometric properties of the test, items with poor and negative discrimination indices (D) were excluded, resulting in a test (D = 0.39) that is significantly better (p-value 0.00 at $\alpha = 0.05$) than the initial preboards (D = 0.28). Pilot testing of the revised instrument was conducted using the eLET system. Test results revealed that respondents scored highest in items that require application (78.43%) and lowest in items that require analysis (67.65%). In terms of per subject performance, respondents scored highest in Principles of Teaching (75.05%) and lowest in Curriculum Development (64.71%).

Keywords: e-LET, Professional Education, Intervention, LET, Study Strategies

10:40-11:00

319 - Needs Assessment, Gap Analysis and Intervention Mapping: Streaming Nursing Program's Implement

Meriales, Marianne I., Taposok, Jza A., Yongque, Rocelle Jean J., Palalay, April Jxeel L., Dela Cruz, Carlo Jason S., Mamaluba, Emmalyn M.

11:00-11:20

320 - USM Education 4.0: Building Adaptive Higher Education Through Technology in the New Normal

Elsa A. Gonzaga, Ma. Luz D. Calibayan, Hazel Ann S. Soriano, Abubakar A. Murray, Eugene G. Ranjo, Kharlo J. Subrio

ABSTRACT. This project aims to develop online management system, reference guide and learning program in the effective utilization and integration of technology in higher education to be able to adapt to the new normal. From the survey conducted among 108 faculty members, usefulness of technology, and their knowledge in using technological and online platforms gained a very satisfactory means of 3.66 and 3.47, respectively. However, faculty find difficulty in terms of integrating technology in teaching with a mean of 2.28. Among 281 students surveyed, knowledge and skills in technology got the highest mean of 3.50 followed by perceived usefulness of technology with a mean of 3.28. However, integrating technology in learning got the lowest mean of 2.52. These results show that both faculty and students are ill-equipped in terms of integrating technology in teaching and learning. Meanwhile, the data gathered will serve as basis for selecting the participants for the focused group discussion (FGD). It will also be used for developing the appropriate training program for the faculty and students. On the other hand, the online management system was on the initial stage of development. Login page and curriculum details window was already created and tested. Meanwhile, benchmarking on manuals of other higher education institutions in the implementation of flexible learning was sought in preparation for the creation of a reference manual on integrating technology in teaching and learning.

Keywords: best practices, educational technology, new normal, teaching and learning, technology integration

11:20-11:40

321 - Efficiency of Various Physical Exercises, Dietary Intakes and Health Conditions of USM Employees: Basis for Program Intervention & Development of Database Management System

Moreno B. Java, Jr., Helen Grace D. Lopez, Urduja G. Nacar, Ryan Z. Gonzaga, Carlo Jason S. Dela Cruz, Marlene E. Orfrecio

ABSTRACT. Health and well-being in the workplace have become an increasing subject in different media platforms. The main objectives of this study to assess the level of physical activities, dietary intakes, health conditions as intervention tool for common health problems of University of Southern Mindanao employees as bases for program intervention and development of health and fitness database management system. Physical Activities of the respondents will be measured using the long version of International Physical Activity Questionnaire (IPAQ) which comprises of 4 sets of questionnaires. For dietary intakes, the Dietary Intake Assessment Form will be used. Finally, for Health Conditions, the Health Condition Questionnaire which comprises of two parts will be used. The pretest and post-test

approach will also be applied to assess the efficiency of Various Physical Exercises as intervention tools for Common Health Problems. All these data to be gathered will be used to develop health and fitness database management systems for USM employees. Using Simple Random Sampling with stratified proportional allocation, the target number of respondents will be 141 for teaching and 70 for non-teaching.

Keywords**:** Aerobic Dance, Biking, Brisk Walking, Dietary Intake, Exercise, Health Condition, Physical Activities

11:40-12:00

322 - Exploring Indigenous Narratives from the South: The Pe'ngang and the Role of Datu in the Conflict Resolution Among the Obo Manobo

Rowell P. Nitafan

8:40-9:00

413 – "Laro Mo, Sagot Ko": A Sports Management Skill Development Project

Cheeze R. Janito and Moreno B. Java Jr.

ABSTRACT. Considering the impact and importance that it brings to the community; the conduct of sports tournament is becoming more regular nowadays especially during fiesta or foundation anniversary in the locality. In line with this, the necessity to capacitate potential residents, Sangguniang Kabataan officials and members to manage local sports tournaments is also becoming more vital to ensure that objectives of the sports program are being achieved. The "Laro Mo, Sagot Ko": A Sports Management Skills Development Project will provide opportunity for the localities to be trained into sports officiating and sports management to lessen the financial burden of running the sports tournament. Further, the focus group discussion among the members of barangay local government unit revealed that there is a need to increase the capacity of the participants on sports management and officiating in volleyball and basketball. This extension project will use both face-to-face approach and development of Information Technology materials to effectively achieved the objectives of capacitating its clients during this time of pandemic. The faculty members of the Institute of Sports Physical Education and Recreation specialized in sports management, basketball officiating and volleyball officiating will be the content creators of the videos to be used as supplemental learning materials among 25 selected members of Sangguniang Kabataan of Barangay Dagupan.

Keywords: Sports Management, Basketball Officiating, Volleyball Officiating, Sangguniang Kabataan, IT Materials

9:00-9:20

414 – Kabataang Kontra Droga at Terorismo: Sports Development Project Phase 1: Skills Acquisition and Development

Marlene Orfrecio, Gladys Pearl O. Ambrocio, Elpedio A. Arias, Jessa S. Buisan, Marichu A. Calixtro , Priscilla P. Dagoc, Jerum B. Elumbaring , Cheeze R. Janito, Moreno . B. Java Jr., Vinus P. Java, Helen Grace D. Lopez, Marlon A. Mancera, Norge D.Martinez, Marlene E. Orfrecio, Eduard S. Sumera, Ruben L. Tagare, Mark. E. San Pedro, Emmanuelle E. Vios, Bae Kellah Landawe and Jemwell Francisco

ABSTRACT. The campaign on drugs and terrorism since the assumption of Former President Rodrigo R. Duterte in 2016 became hard-hitting. This is because of the findings of the Philippine National Police on how drugs and terrorism proliferated in the country. Hence, Kabataan Kontra Droga at Terorismo on February 1, 2019, through Command Memorandum Circular 20-2019 which intends to organize, train, and mobilize the youth and student sectors as advocacy support groups that will stand against drugs and terrorism was launched and executed. Sport is an instrument that set-asides geographical borders and social differences. It promotes social inclusion and economic development in different geographical, cultural, and political contexts. Thus, the program on Kabataan Kontra Droga at Terorismo Sports Development Project was implemented to support the aggressive campaign of the government to fight against drugs and terrorism. It aimed to equip the youth of Makilala with the competencies significant to sustainable sports programs that will help redirect the youth's

attention to the lure of drugs and terrorism. Inclusive in the project is the skills acquisition and development. The Skills Acquisition and Development was conducted every Friday and Saturday from October 29 to November 14, 2021. Fifty-five (55) participants from 10 barangays completed the program in learning the process of playing basketball and volleyball. The collaborative efforts of Makilala Police Station as implementing agency of the KKDAT program, and the Local Government of Makilala as a funding agency contribute to its success. It is a 3-year project tightened with a Memorandum of Agreement. In 2022 Five (5) of its completers were already conducting training activities in their respective community. 20 of its graduates were also representing their respective barangay in the 1st AMQ Inter-Barangay Basketball and Volleyball tournament and Sitio Katipunan Inter-Purok Basketball League. Moreover, a new activity entitled "In-School Sports Clinic" has been forwarded and approved by the Local Government Unit of Makilala which form part of the KKDAT program and will be implemented in December 2022.

***Keywords*:** Drugs, KKDAT-SDP, Terrorism, Skill Development

9:20-9:40

415 – BIO-NIHAN PARA SA KALIKASAN: Promoting Holistic Biodiversity Conservation Through Community Partnership

Cherie Cano-Mangaoang, Bryan Lloyd P. Bretaña, Cromwel M. Jumao-as, Florence Roy P. Salvaña

ABSTRACT. Biodiversity is a key indicator of a healthy ecosystem; thus, its conservation is vital. Sustainability in conservation is attained through community partnerships and collaboration with different stakeholders. The project was carried out to promote holistic biodiversity conservation through community partnership by providing technical assistance and skills enhancement training to trek guides and porters of Mt. Apo utilizing the Mandangan Trail. Series of activities were conducted prior to the implementation of the project including consultative meetings with the partner agency, profiling of the target parabiologists, needs assessment, and conduct of inception meeting. The skills enhancement training on practical identification of flora and fauna was participated by 15 selected porters and guides. A pre-test and post-test were given to the participants and statistical analysis showed significant differences (p-0.021) between test scores. The IEC materials for the project are yet to be completed as the rapid assessment of flora and fauna along the Mandangan trail is yet to be scheduled. Validation of these EIC materials will also be conducted.

Keywords: biodiversity, conservation, community, Mt. Apo, parabiologist

9:40-10:00

416 – Diffusion and Adoption of "Tilakas" Technology

Leonila V. Papalid and Mae R. Escalera

ABSTRACT. Tilapia is the number one captured fish in inland waters and second most cultured fish in the country. It is a fast-grower, omnivorous, and disease-resistant but also a very prolific fish. They tend to crowd wild aquatic environment as well as in captivity. Thus, most inland fishers caught undersized tilapia that are less marketable and sometimes turned

into a waste resource when left unsold. One way of saving the resource is to process them into a value added product. Tilakas is a term coined for "tilapiang pinikas" in Cebuanos and "tilapiang salpakas" in Ilonggos. The acceptability of tilakas prepared in different flavor enhancers was determined through sensory evaluation. Results showed that sweetened tilakas appeared to be the most acceptable product. IEC materials on tilakas technology were developed and ready for use. Collaboration with Municipal Agriculture Office, the Provincial Fishery Office BFAR 12, barangay council of Cuyapon as well as Fisheries Society was forged then to bring tilakas technology to the recipients. Twenty five recipients were taught on the basics of Good Manufacturing Practices, simple cost and return analysis as well as the process flow of producing tilakas. Personal protective equipment were used by the recipients as they did the splitting, brining, soaking, drying and packaging of tilakas. To ensure product safety, one solar fish dryer was turned over to the recipients as a model facility. The conduct of the seminar-workshop truly helped them in saving undersized tilapia from being wasted by turning it into a more acceptable and saleable product.

Keywords: tilakas, tilakas technology, undersized tilapia

10:20-10:40

417 - Project 6. Capability Building of Rubber Stakeholders and Role of Women and Their Children Natural Rubber Industry in Agusan del Sur and North Cotabato

Mary Rodelyn A. Cariaga and Razel O. Montemor

ABSTRACT. The project is under the program entitled Land Management of Diverse Rubber Based Systems in Southern Philippines (SLaM 2017/040) funded by Australian Center for International Agricultural Research (ACIAR) and Philippine Council for Agriculture and Aquatic Resources Research and Development (PCAARRD) It aims to boost the household incomes for indigenous smallholder farmers in the uplands of southern Philippines particularly in Agusan del Sur through the introduction of profitable rubber intercropping systems, sustainable management regimes and capacity building. Trainings are conducted to the smallhold rubber farmers in Agusan del Sur, namely: (1) 7 Rubber Production, (2) 12 Rubber Tapping; (3) 14 Technical Awareness on Rubber Diseases Identification & Control. To date, surveys are still on going to determine the technologies adopted by the farmers-participants.

Keywords**:** capacity building, men and women farmers, smallhold rubber stakeholders, Agusan del Sur, rubber

10:40-11:00

418 – Juan Food: Enabling Rural Families Through Home and Community Garden in Support for Household Livelihood in Barangay Dagupan

Mary Rodelyn A. Cariaga, Romiel John P. Basan and Metche Anne C. Logronio

ABSTRACT. Vegetable farming is one of the promising economic opportunities to reduce rural poverty and unemployment. It serves as an important source of independent income and can provide sufficient supply of food and nourishment. In response to the community need, JuanFood aims to (1) to capacitate the local partners; (2) to establish home and community gardens; and (3) to facilitate point to point vegetable product marketing. In partnership with

DA-LGU Kabacan, DAR and Eastwest Seed Company, the collaborative project in Brgy. Dagupan had identified twenty (20) community partner-farmers. Vegetable production demonstration site was identified and agreed upon by the project partners. Seed sowing and land preparation activities were done following recommended practices. As part of the catch up plan, series of agro-enterprise trainings will be conducted.

Keywords**:** community garden, livelihood, recommended practices, vegetable farming, vegetable

11:00-11:20

419 – Islamic Knowledge Development and Enhancement of Livelihood Skills among Bangsamoro

Hasim K. Iskak

11:20-11:40

420 – Consultancy for Agricultural Productivity Enhancement (CAPE2) Program

Francisco Gil N. Garcia, Edward A. Barlaan, Mary Joy S. Cañolas, USM Experts

ABSTRACT. The Department of Science and Technology 12 (DOST 12), in partnership with the University of Southern Mindanao (USM) through the Extension Services Office (ESO), is implementing the project titled "Implementation of Upgraded Consultancy Services for MSMEs thru Consultancy for Agricultural Productivity Enhancement (CAPE) Program in Region12". The project provides consultancy teams to undertake technology improvement and enterprise productivity studies in micro, small and medium enterprises (MSMEs) in the agricultural sector under the program Consultancy for Agricultural Productivity Enhancement (CAPE). It aims to institutionalize effective farm management strategies to improve agricultural production, including transferring and commercializing better technologies. On December 29, 2022, the Memorandum of Agreement between the USM and DOST 12 is in effect. The project started in January 2022 with a total of 20 USM experts assisting farm owners who are engaged in: (1) High-Value Crops Production, (2) Orchid Farm production, (3) Livestock production, and (4) Poultry production. The experts' technical assistance to forty farms from North Cotabato, Sultan Kudarat, South Cotabato, General Santos City, and Sarangani Provinces through farm & home visits, telephone calls, training, & method demonstration is already in the intervention stage.

Keywords**:** Productivity enhancement, consultancy services, agricultural production

11:40-12:00

421 – Integrated Services for Enhanced Education (I-SEE): A Connectivity Resilience Project Amidst Covid-19 Pandemic

Janice M. Bangoy, Genghis Khan P. Manero, Ardniel A. Baladjay, Alan G. Dalo, Jovelyn S. Gesulga, Myrna R. Tan, Jasmin A. Pecho and Mary Joy S. Cañolas

ABSTRACT. Educational institutions must prioritize finding effective methods of providing new learning opportunities according to their environment, student characteristics, teacher training, economic crisis, and technology advancement to make learning more efficient, equitable, and innovative in higher education. The University of Southern Mindanao Extension Services Office is making additional efforts to provide remote learning services via print, radio, video, online, and offline electronic resources to ensure the continuity of learning amidst the Covid-19 pandemic. These include printing and distributing technology production guide modules, broadcasting video lessons through the internet and radio, and are accessible through computer desktops, laptops, or mobile phones. The Project has a monthly regular radio program titled "Ugnayan Natin sa Radyo at TV and the Teknogiya sa Radyo at TV School-on-Air program (SOA). The Ugnayan Natin sa Radyo program supports partner agencies in disseminating relevant information to the communities. The Extension Services Office airs the Ugnayan Natin sa Radyo at TV with partner agencies, while the school-on-air on Cacao Production has three organized beneficiaries (2 associations and one cooperative) from LGUs Antipas, Tulunan, and Aleosan. The project team produced ten cacao production printed IEC materials for the SOA beneficiaries.

Keywords**:** Cacao Production, School-on-Air, online learning, enhance education, Information, Education & Communication Materials (IEC)

WINNERS

The 42nd Year-end In-house Review was conducted on December 1-2, 2022 at the Commercial Building in the University of Southern Mindanao. During the activity, all ongoing research projects were presented to a distinguished panel of evaluators. Outstanding projects in five categories were also recognized and identified. The winning projects are:

Category 1 (Basic Research – Science)

1st place: Tamie C. Solpot – Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber

2nd place: Lorelyn Joy Turnos-Milagrosa – Organic-Based Interventions for Selected Crops and Sheep Nutrition

3rd place: Mark Al-Jamie Muttulani – Germplasm Collection, Propagation and Fertilization of Anthurium (*Anthurium andraenum*) in USMARDC

Category 2 (Applied Research – Science)

1st place: Lydia Pascual – Potential Anti-Cancer leads from plants in Region XII Proj. Screening of Plants

2nd place: Pia Amabelle Flores – USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products

3rd place: Adeflor G. Garcia – Project 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation for Rubber Cropping System

Category 3 (Development)

1st place: Edward A. Barlaan – Banana Health Diagnostics: Molecular Surveillance of Major Disease Causal Pathogens of Banana in Region 11 and 12

2nd place: Pia Amabelle M. Flores – DOST PCAARRD and USM Agri-aqua Technology Business Incubator (USM-ATBI

3rd place: Pia Amabelle M. Flores – USM IP-TBM Phase II: Patent Mining of Rubber Technologies Thru Intellectual Property and Technology Business Management (IP-TBM) Operations of the University of Southern Mindanao

Category 4 (Social Research)

1st place: April Rose T. Butalid – Integrating Gender and Development (GAD) Concepts Across Mandated Language, Literature, and Social Science Courses

2nd place: Jacinta T. Pueyo – Intersectionalizing K-12 Graduates' Competencies: a Baseline for Tertiary Instruction, and Materials Development

3rd place: Glyn G. Magbanua – Research Into Practice: Practical Applications of English for Specific Purposes (ESP) in the Workplace

Category 5 (Extension)

1st place: Ardniel A. Baladjay – Tablea: Pangkabuhayan para sa Kotabateñong Pamayanan A Community-based Tablea Production for Sustainable Livelihood in Cotabato

2nd place: Maricel G. Dayaday – SWIPE-Solid Waste and Integrating Program for E-Waste Disposal

3rd place: Tamie C. Solpot – CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate COVID-19 Effects

POSTER COMPETITION

Category 1 (Basic Research)

1st place: Tamie C. Solpot, Ma. Teodora N. Cabasan, Bernadith T. Borja, Melesa M. Prado, and Jomarie Abubakar – Screening of Potential Endophytes As Biocontrol Agent Against Major and Emerging Leaf Diseases of Rubber

2nd place: Tamie C. Solpot. Ma. Teodora N. Cabasan, Bernadith T. Borja, Melesa M. Prado, Jomarie V. Abubakar – Encroachment of New Colletotrichum species Infecting Rubber in the Philippines

3rd place: Frederick John B. Navarro, Deinmark L. Antes, Bryan P. Bretana – Development and Validation of a Reversed Phase High Performance Liquid Chromatography-Photodiode Array Detection Method for Simultaneous Identification of Markers in Zingiber Species

Category 2 (Applied Research)

1st place: Edward A. Barlaan – Utilization of DNA Probe Kits for Detection and Monitoring Banana Diseases in Digital PCR or Quantitative Real-Time PCR: A Big Boost to Banana Industry

2nd place: Bryan P. Bretana, Deinmark L. Antes, Frederick John B. Navarro – Improving Production System for Zingiber species in PICRI: Comparison of Traditional and Micropropagation Techniques

3rd place: Frederick John Navarro, Deinmark Antes, Bryan Bretana – Nutrient retention in commercial production of USM

Category 3 (Development)

1st place: Pia Amabelle M. Flores – Intellectual Property and Technology Business Management

2nd place: Pia Amabelle M. FLores – USM Agri-Aqua Technology Business Incubator

Category 4 (Social Research)

1st place: April Rose T. Butalid, Elangbai B. Dimasingkil, & Estella B. Barbosa – Integrating Gender and Development (GAD) Concepts Across Language, Literature, and Social Science Courses

2nd place: Nerissa G. Dela Vina, Deinmark L. Antes, Frederick John B. Navarro, Leila S. Moscoso, Ray-Hannah Makakena, Abubakar A. Murray – Unravelling Generation X and Y Consumption Behavior for Halal Food Products

Category 5 (Extension)

1st place: Maricel G. Dayaday, Fredelino A. Galleto, Jr. Saque.Amilbahar – SWIPED

2nd place: Ardniel A. Baladjay, Gwen Iris D. Empleo, Sheena B. Lucena, and Janice M. Bangoy – Tablea: Pangkabuhayan para sa Kotabateñong, Community- Based Tablea Production for Sustainable Livelihood in Cotabato Pamayanan

3rd place: Tamie C. Solpot, Frederick B. John Navarro, Ivy Mar B. Cabornida, Pamela B. Villanueva, Mary Joy R. Gran, Gary G. Segundo – CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate Covid-19 Effects

WORKING COMMITTEE

Year-End In-House Review
2022

Role	Persons Involved	Responsibilities
Overall Coordinator	Lydia C. Pascual	
Executive/Steering Committee		
	Ma.Teodora N. Cabasan Mary Joy S. Canolas Debbie Marie Verzosa Efren E. Magulama Abubakar A. Murray Lydia C. Pascual Josephine R. Migalbin	➢ To plan and supervise the different activities, welcome and receive the guests ➢ To steer the different committees to action and monitor their activities
Program Committee		
Chairperson	Debbie Marie B. Verzosa	➢ To prepare and print the program and schedule of activities ➢ To distribute the program to all coordinators, advisories and student researchers and USM Key Officials before the review schedule, ➢ To prepare and print the certificates for evaluators, presenters and participants.
Co-Chairperson	Reijie Madre	
Member	Jasmin A. Pecho Athena Beulah Pineda Tessie Eucogco Clarrisa Pillado	
Certificates Committee		
Chairperson	Rhea Ann Antonio	➢ To request certificates from HRMDO ➢ To facilitate the printing and distribution of certificates
Co-Chairperson	Merchia Mayormente	
Member:	Marlon Marquez	
Evaluators Search/Invitation Committee		
Chairperson	Mary Joy S. Canolas	➢ To invite participants and evaluators
Co-Chairperson	Bernadith T. Borja	
Member	Diether Barro	
Registration and Ushering Committee		
Chairperson	Leanne Jay S. Manceras	➢ To usher and register the visitors and participants ➢ To submit the master list of guests and presenters/participants to the secretariat ➢ To prepare the list of visitors, evaluators, and moderators for presentation during the opening program, ➢ To print the names of evaluators to be used during the affair in the session hall
Co-Chairperson	Amancio S. Manceras, II	
Members:	Athena Beulah Pineda Kimberly Lanera Clarrisa Pillado Zaibel Rose Tamon	
Secretariat and Proceedings Committee		
Chairperson	Nenita E. Olero	➢ To collect hard and e-copy of all reports
Co-Chairperson	Dyane Rhea Bana-ay	

Member	Karizza Jane Pejaner	➢ To type all summary output and synthesis during the review ➢ To monitor and make sure that all necessary forms are prepared and reproduced on time in sufficient number and distributed accordingly ➢ To consolidate research reports for the proceedings preparation ➢ To come up with ready to publish proceedings after the review ➢ To develop compendium and database programs for the results and proceedings
Rapporteur Committee		
Over-all Chairperson	Janice M. Bangoy – Extension	➢ To assist the members of the panel in the preparation of thesis and reports ➢ To get 3 copies of each report for file purposes preparation of the proceedings ➢ To prepare the summary of activities for presentation during closing program ➢ To assist in the consolidation and integration of output review
Session I- Basic		
Co-Chairperson	Mary Grace S. Balbuena	
Member	Joelle Aguirre	
Computer operator	Reijie E. Madre	
Session II - Applied Co-Chairperson	Helen A. Macailing	
Member	Abegail Sauyen	
Computer operator	Joshua Canlas	
Session III - Development Co-Chairperson	Kharlo J. Subrio	
Member	Melesa M. Prado	
Computer operator	Joemarie Abubakar	
Session IV - Extension	Janice M. Bangoy	
Member		
Computer Operator		
Audio-Visual Equipment Committee		
Chairperson	Eugene G. Ranjo	➢ To provide and set-up all audio-visual equipment needed during the activity ➢ To restore all the equipment after use
Co-Chairperson		
Member	Floreey Mae Pascua Nelson Balneg Arjay Agbunag Clarence Dave G. Galas	
Hall Preparation, Decoration and Restoration Committee		
Chairperson	Marlene E. Orfrecio	➢ To prepare the venues for the opening and closing program during the conduct of the activity ➢ To ensure cleanliness and orderliness of the venues before and during the event, and
Co-Chair Member	Rezin G. Cabantug Emmanuelle E. Vios Jemwell B. Francisco RDE Team	

		➢ To restore the venues after the activity ➢ To prepare poster stands
Paper and Poster Award Committee		
Chairperson Co-Chairperson	Sandra Joy P. Pahm Mary Ann Rama	➢ To facilitate in the preparation of the text certificates of awards ➢ To facilitate awarding of winners of papers and posters contest ➢ Coordinate with the program/certificate committee
Members	Bernadith Borja Neil Pep Dave Sumaya Roy Ricabar Cris Jun Callano Gerwin Alcalde	
Honorarium and Token Committee		
Chairperson	Ma. Teodora N. Cabasan	➢ To facilitate the preparation of payroll and cash advance for the evaluators' honorarium; and ➢ To prepare the tokens for the evaluators.
Co-Chairperson	Mylin C. Prado	
Member	Deborah Psyche D. Miras Racel Moadas Fritzi Jules Lanera	
Food and Accommodation Committee		
Chairperson	Melchie Palapar	➢ To arrange with Hostel regarding the food and snacks to be served during the In-House Review. ➢ To determine the number of persons to be served so that enough food will be provided to the participants. ➢ To prepare and collect meal stub. ➢ To facilitate accommodation preparation of the evaluators
Co-Chairperson	JmJson Bautista	
Member	Hostel	
Documentation Committee		
Chairperson	Roviline R. Pal-iwen	➢ To document various activities ➢ To assist the proceeding committee in the presentation and publication of the proceedings ➢ To write a news article of the said activity
Co-Chair	Elaine Genevive B. Parcon	
Member		
Transportation and Electricity Committee		
Chairperson	Joel V. Misanes	➢ To provide vehicle to ferry and fetch invited guests ➢ To check all electrical connections before the start of the activity and entire duration of the activities ➢ To provide and facilitate standby generator in case of power interruption/failure
Co-Chairperson	Benjamin E. Fortinez	
Member	Manuel Tayong Oscar Sebastian CTI Faculty	
		MODERATORS
Session I (Basic)	Renee Jane A. Ele	➢ To facilitate the flow of reporting; and ➢ To introduce the reporters and ensure that time is strictly observed
	Joeseph S. Quisado Marlyn Resurreccion Lorelyn Joy N. Turnos	

Session II (Development)	Rowell Nitafan Phoebe Baure Karizza Jane Pejaner Warren Adamat	
Session III (Applied)	Courtney Donque Kathleen Bolotaolo Khristine Joy Garcia Gideon Sumayo	
Session IV (Extension)	JP E. Fortinez Rene Cabahug Esperanza D. Lucena Floreey Tamon	➢
EMCEE Opening Program	Ashley Coleen Ortiz	➢ In charge of the Opening Program
EMCEE Closing Program	Marlyn Resurreccion	➢ In charge of the Closing Program

CLOSING PROGRAM

Commercial Building
December 2, 2022
1:30 PM

SYNTHESIS PRESENTATION

SESSION 1	**MS. MARRY GRACE S. BALBUENA** EPS I
SESSION 2	**ENGR. KHARLO J. SUBRIO** EPS II
SESSION 3	**PROF. HELEN A. MACAILING** CRC, CBDEM
SESSION 4	**MS. JANICE M. BANGOY** TS II
PRESENTATION OF OUTPUT FOR USMARD CENTER RESEARCH	**DR. EFREN E. MAGULAMA** Director, USMARD Center
PRESENTATION OF OUTPUT FOR EXTENSION	**DR. MARY JOY S. CAÑOLAS** Director, Extension Services
PRESENTATION OF OUTPUT FOR COLLEGE-BASED RESEARCH	**DR. LYDIA C. PASCUAL** Director, Research and Development
PRESENTATION OF OUTPUT FOR PICRI RESEARCH	**DR. ABUBAKAR A. MURRAY** Director, PICRI
PRESENTATION OF RDE OUTPUTS	**DR. MA. TEODORA N. CABASAN** Vice President, RDE
ACCEPTANCE OF RDE OUTPUTS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
AWARDING OF BEST PAPERS AND POSTERS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV **DR. MA. TEODORA N. CABASAN** Vice President, RDE
CLOSING MESSAGE	**DR. FRANCISCO GIL N. GARCIA** SUC President IV

Singing of USM Hymn

EMCEE: Marlyn Resurreccion

VISION

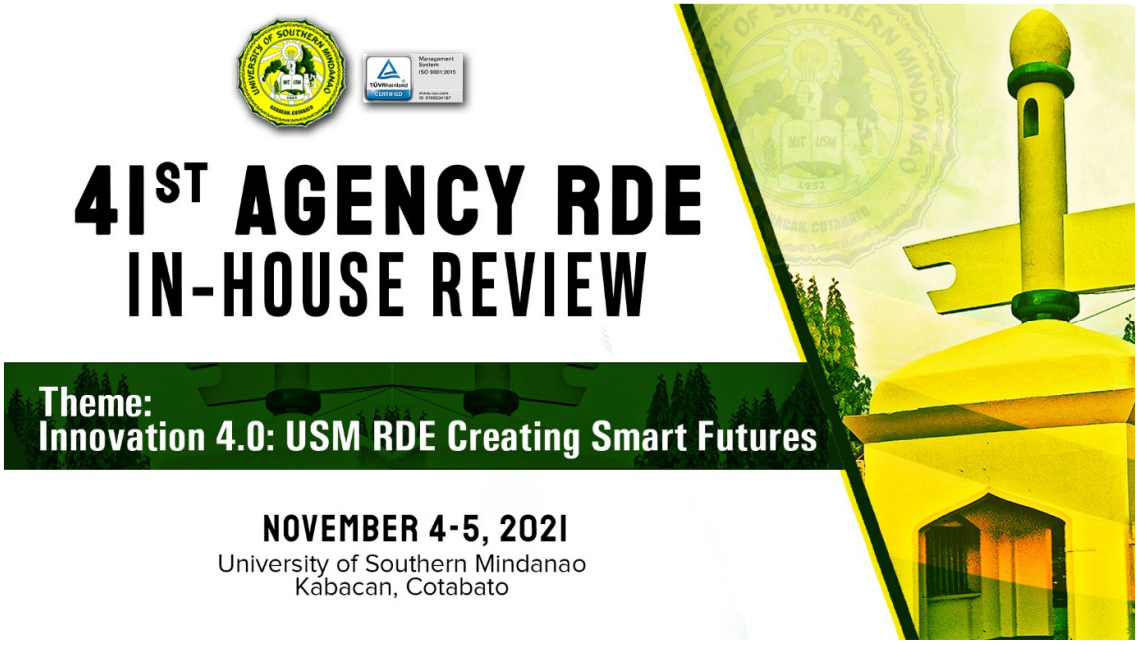
USM envisions upholding its status of excellence in Research and development by continuing to be the pioneer source of technology and information that are on track towards poverty reduction, food security, and global competitiveness for cohesive and sustainable development among its multi-socio-cultural clienteles.

MISSION

To put into operation a system to undertake multi-disciplinary approach for R & D activities to ensure that technologies and information generated can address the prevailing concerns and issues in the local, regional and national levels for sustainable development.

GOALS

- Improve the system with scientific excellence through collaborative and interdisciplinary R&D activities that are anchored on the University's vision/mission;
- Conduct researches and generate technologies that could provide solutions and address the local, regional, and national concerns and issues;
- Provide a mechanism to ensure that research results be effectively and efficiently delivered to the clients for utilization and commercialization; and
- Build up resource generation facilities for continuous and sustainable R&D programs that are geared towards ensuring food security, global competitiveness, socio-cultural responsiveness that eventually improve the quality of life of the clienteles.



This serves as an invitation

Registration form:
https://forms.gle/dzQR84F2ZoE7nEZW6

Zoom link:
https://zoom.us/meeting/register/tJUqdOqvqTIpG9AWyDkSFwRDxkFAojDpkFna

RATIONALE

This Research Development & Extension (RDE) Agency In-House Review is an annual/yearly activity of the University. The main objective is to review and evaluate all on-going and completed Research Development and Extension Programs/Projects/ Studies. This serves as avenue for all researchers, extension workers and other stakeholders to convene and exchange new knowledge or products generated and development/extension strategies relevant to the University's vision, mission, and objectives. It is also through this activity that investments in RDE can be appraised thoroughly to ensure that RDE activities are geared toward addressing the needs and problems of the clientele of the university in its service area, in particular, and in the national level in general, for sustained agricultural development and its allied fields. Expectedly, very active interactions will form part of the highlights.

OBJECTIVES

1. To evaluate completed and on-going RDE projects/activities particularly with regard to the attainment of objectives and adherence to the approved programs;

2. To identify problems met during the implementation and recommend specific courses of action, i.e. continuation, extension, modification of planned activities and methodology, suspension, termination, etc., in compliance with the recommendations of the evaluating panel;

3. To identify technologies generated for field testing, verification, and piloting before its final dissemination/promotion and commercialization;

4. To identify mature technologies ready for packaging and dissemination;

5. To identify significant results for policy formulation and development;

6. To identify new researchable areas; and

7. To record and monitor both in-house and externally funded researches.

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No.: (064)572-2138
Email address: op@usm.edu.ph

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OFFICE OF THE PRESIDENT

Message

My warmest greetings to everyone participating in our 41st Agency Research, Development and Extension In-house Review. We are gathered again to assess and evaluate the outputs of our RDE projects. This activity is vital in keeping us on track towards the accomplishments of the set goals and objectives.

As we pursue further development and embrace various technological advances in the fields of research, development and extension, may we stand firm with our passion to help and contribute greatly to these concerns. May we continuously seek and work on helping improve the lives of the people we serve through our RDE endeavors.

God bless our every effort made and will be making as we head-on to a productive two-day In-house Review.

FRANCISCO GIL N. GARCIA, PhD
SUC President IV

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No. 572-2638
Email Address: usmvprde@usm.edu.ph

OFFICE OF THE VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

Message

The theme of 41st Agency RDE In-House Review, "Innovation 4.0: USM RDE Creating Smart Futures" reminds, encourages and pushes us to higher levels, efforts and standards in research, development and extension (RDE) in the university. We look to the future and as we continue raising the bar through innovative advances in RDE in USM, we can be one of the premiere RDE universities not only in the country but also in the ASEAN region or ultimately in the world. We look forward to creating innovations and breakthroughs to become more competitive nationally and internationally. Yes, USM we can do it!

We appreciate the efforts of all faculty and researchers who did their best despite the challenges and limitations caused by the COVID-19 crisis. Wishing all the presenters of ongoing and completed programs and projects the very best of the best.

We congratulate and thank the organizers- USMARD Center with RDO, RPSO, ESO and other RDE units, different committee heads and members, distinguished evaluators and the USM administration for a successful 41st Agency RDE In-House Review.

EDWARD A. BARLAAN, Ph.D.
VP for Research, Development and Extension

GENERAL SCHEDULE OF ACTIVITIES

DAY 1: November 4, 2021 (Thursday)

TI ME	ACTIVITY
8:30 AM – 9:00 AM	Registration and Entering Zoom
9:00 AM – 9:45 AM	Opening Program
9:45 AM – 10:00 AM	Going into Breakout Rooms
10:00 AM – 11:20 AM	Presentations
11:20 AM – 12:00 NN	Poster Viewing
12:00 NN – 1:00 PM	*Break*
1:00 PM – 4:00 PM	Presentations

DAY 2: November 5, 2021 (Friday)

TIME	ACTIVITY
8:20 AM – 12:00 AM	Presentations
12:00 PM- 1:00 PM	*Break*
1:00 PM – 2:40 PM	Presentations
2:40 PM – 3:00 PM	*Break*
3:00 PM – 3:30 PM	*Tabulation of Scores*
3:30 PM - 5:00 PM	Awarding and Closing Program

Opening Program

Via Zoom
November 4, 2021
8:30 AM

Invocation	**In-Video**
National Anthem	**In-Video**
Welcome Remarks	**Dr. Edward A. Barlaan** Vice President for RD&E
Message of the President	**Dr. Francisco Gil N. Garcia** SUC President IV
Rationale	**Dr. Efren E. Magulama** Director, USMARD Center Over-all Coordinator, In-House Review
Presentation of Evaluators	**Dr. Ma. Teodora N. Cabasan** Director, Research and Development Office

EMCEE : Julius Jerome G. Ele

EVALUATORS

Session I

Basic Research: Natural Science, Engineering & ICT

Dr. Emmanuel Leaño

Dr. Lynn Esther Rallos

Dr. Lorna Vilbar

Session II

Applied Research: Natural Science, Engineering & ICT

Dr. Mylene Anwar

Dr. Violeta Bello

Dr. Laiza L. Limpin

Session III

Extension and Development

Dr. Siony S. Brunio

Dr. Filma C. Calalo

Prof. Gloria dela Peňa

Session IV

Basic and Applied Research: Education and Social Science

Dr. Ruth Ortega-Dela Cruz

Dr. Mervin Gascon

Dr. Rosalina Palanca-Tan

MODERATORS

Session I

Basic Research: Natural Science, Engineering & ICT

Day 1 (November 4, 2021)
AM- Marlyn A. Resurreccion
PM- Frans Bert Gomez

Day 2 (November 5, 2021)
AM- Rowell Nitafan
PM-Courtney Dunque

Session II

Applied Research: Natural Science, Engineering & ICT

Day 1 (November 4, 2021)
AM- Maria Luz D. Calibayan
PM- Gerlie E. Ticbe

Day 2 (November 5, 2021)
AM- Joseph Castillo
PM- Leanne Jay Manceras

Session III

Extension and Development

Day 1 (November 4, 2021)
AM- Rowell Nitafan
PM- Courtney Dunque

Day 2 (November 5, 2021)
AM- Aljory John Boje
PM- Frans Bert Gomez

Session IV

Basic and Applied Research: Education and Social Science

Day 2 (November 5, 2021)
AM- Mirasol O. Verona
PM- Richelle Sampiano

Closing Program

Via Zoom
November 5, 2021
3:30 PM

SYNTHESIS PRESENTATION	
SESSION 1	**MS. MARRY GRACE S. BALBUENA** EPS I
SESSION 2	**ENGR. KHARLO J. SUBRIO** EPS II
SESSION 3	**MS. JANICE M. BANGOY** TS II
SESSION 4	**DR. NANCY DUQUE** CA Faculty
PRESENTATION OF OUTPUT FOR USMARD CENTER RESEARCH	**DR. EFREN E. MAGULAMA** Director, USMARD Center
PRESENTATION OF OUTPUT FOR EXTENSION	**DR. MARY JOY S. CAÑOLAS** Director, Extension Services
PRESENTATION OF OUTPUT FOR COLLEGE-BASED RESEARCHES	**DR. MA. TEODORA N. CABASAN** Director, Research and Development
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PRESENTATION OF RDE OUTPUTS	**DR. EDWARD A. BARLAAN** Vice President, RDE
ACCEPTANCE OF RDE OUTPUTS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
AWARDING OF BEST PAPERS AND BEST POSTERS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV **DR. EDWARD A. BARLAAN** Vice President, RDE
RECOGNITION FOR PUBLICATION	**DR. FRANCISCO GIL N. GARCIA** SUC President IV **DR. DEBBIE MARIE B. VERZOSA** Director, Publication Services
CLOSING MESSAGE	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
CLOSING PRAYER	**ENGR. KHARLO J. SUBRIO** EPS II

EMCEE: Glyn G. Magbanua

Day 1 Presentations
(November 4, 2021)

Starts	Ends	Session 1 - Basic Research: Natural Science, Engineering, and ICT	Session 2 - Applied Research: Natural Science, Engineering, and ICT	Session 3 - Extension and Development	Session 4 - Basic and Applied Research: Education and Social Science
10:00	10:20	S102 - SMART Project Study # 3: Development of Weather-based forecasting as Early Warning System for Integrated Pest Management of High Value Crops (Purificacion O. Cahatian)	S201 - Enhancing RD&E Indexing System (RDEIS) of USM: Design, Development and Evaluation (Melecio A. Cordero, Jr., Eugene G. Ranjo, Ryan Z. Gonzaga)	S302 - USM CA Extension Services: AgriKonek Gamit ang SocMed (Josephine R. Migalbin, Julius Jerome Ele, Tamie C. Solpot)	
10:20	10:40	S109 - Comparative Analysis of the Biochar Derived from Rice Straw, Rice Husk, Corn Stalks, Corn Cobs, and Oil Palm Empty Fruit Bunch on Soil Water Retenion Capacity and Development and Growth of Pechay (Brassica rapa subsp. Chinensis) (Tito Jun T. Tidula and Rezin Cabantug)	S202 - Digitalization of USM Faculty Workload (Hazel Ann S. Soriano, Ryan Z. Gonzaga, and Arjay S. Agbunag)	S304 - Integrated Video And Audio Learning Services For Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2020) (Janice M. Bangoy, Ardniel A. Baladjay, Genghis Khan P. Manero, Alan G. Dalo, Jovelyn S. Gesulga and Myrna R. Tan)	
10:40	11:00	S125 - Screening of Plants from Region XII with Potential Anti-cancer Activity (Loveille Jun A. Gonzaga, Harem R. Roca, Francisco Gil N. Garcia, Lydia C. Pascual)	S204 - Design and Development of Online USMCEE Registration System (Arjay S. Agbunag, Clarence Dave C. Galas, Alvin C. Mibalo)	S310 - Sustainable Human Development and Resiliency (SHuDaR) Framework for the COVID-19 Pandemic-Affected Communities in North Cotabato Province (Ma. Dely P. Esberto, Joel V. Misanes, Samson C. Rapuza, Manuel J. Tayong)	
11:00	11:20	S122 - Screening of Potential Endophytes as Biocontrol Agent Against Major and Emerging Leaf Diseases of Rubber (Tamie C. Solpot, Bernadith T. Borja, Ma. Teodora N. Cabasan, Melesa M. Prado, and Jomarie Abubakar)	S234 - Molecular Detection and Identification of Microbial Pathogens of Banana (Edward A. Barlaan, Michael James L. Abrea, and Evelyn F. Alejandro)	S312 - Curriculum Development and Offering on Halal Science and Scholarship for SUC Faculty on Halal Science (Josephine R. Migalbin, Ruby Hechanova, Luzviminda T. Simborio, Jurhamid C. Imlan)	
11:20	12:00	POSTER VIEWING	POSTER VIEWING	POSTER VIEWING	POSTER VIEWING
12:00	1:00	LUNCH BREAK	LUNCH BREAK	LUNCH BREAK	

** Projects highlighted in green are competing.

Day 1 Presentations
(November 4, 2021)

Starts	Ends	**Session 1 - Basic Research: Natural Science, Engineering, and ICT**	**Session 2 - Applied Research: Natural Science, Engineering, and ICT**	**Session 3 - Extension and Development**	**Session 4 - Basic and Applied Research: Education and Social Science**
1:00	1:20	S124 - Evaluation and characterization of ten promising varieties of cacao in Type II and III agro-climatic zones in Northern and Southern Mindanao (Cris Harvin Rey G. Calvo, Gwen Iris D. Empleo, Romulo L. Cena, Sheena B. Lucena and Jayson S. Baltazar)	S210 - Commercialization of Chayote Products (Jenny B. Mamacus, Emilie S. Estelloso, Janice E. Reynes, Jo-Ann D. Santos, April Geraldine M. Quiñonero)	S313 - Project 2. Market Analysis and Positioning of Processed Halal Chevon Food Products (Jalaloden Marohom, Ivy Mar Cabornida and Crystal Jhane A. Garate)	
1:20	1:40	S110 - Diversifying the Utilization of Corn as Food and Silage for Food Security (Efren E. Magulama, Nenita E. Olero, Jurhamid C. Imlan, Ivy Mar B. Cabornida, Jessie G. Elarde and Joanne E. Duran)	S211 - Standardization Protocol for the Development of USM Food Products (Harem R. Roca, Frederick John B. Navarro, Bryan Lloyd P. Bretaña and Marlon L. Manansala)	S315 - Development And Utilization Of Learning Materials For Community Animal Health Workers (Elizabeth C. Molina, Lilian A. Lumbao and AP Warren P. Adamat)	
1:40	2:00	S127 - Prevalence and Molecular Characterization of Gastrointestinal Parasites in Human-Macaque Interface: The case of Hindang, Leyte and New Israel, Makilala, North Cotabato (Lothy F. Casim, Leanne Jay S. Manceras, Cyrelle M. Besana, Fritzie S. Sia and Rheo Ryan P. Balbuena)	S212 - Evaluation Of Microbial, Physical, And Chemical Properties Of USM High-Value rops Processing Center Food Products For Quality Control Measures (Bryan Lloyd P. Bretaña, Frederick John B. Navarro, and Harem Roca)	S321 - Tablea: Pangkabuhayan Para sa Kotabateňong Pamayanan: Community-Based Tablea Production for Sustainable Livelihood in Cotabato (Ardniel A. Baladjay, Janice M. Bangoy, Gwen Iris D. Empleo, and Sheena B. Lucena)	
2:00	2:20	S131 - Pilot testing and validation of SSR marker kit for Philippine mango germplasm in commercial mango nurseries (Emma K. Sales, Marry Grace S. Balbuena, Jane R. Desamito, and Avigel I. Cabrillos)	S213 - Optimization of Natural Flavored Vinegar and Commercialization of USM Products from High Value Crops (Frederick John B. Navarro, Bryan Lloyd P. Bretana, and Harem R. Roca)	S323 - USM-CA Ugnayan sa mga Magsasakang Moro at Katutubo (Josephine R. Migalbin, Tamie C. Solpot, Baser L. Mamalac, Geoffray R. Atok, Ardniel A. Baladjay, Jurhamid C. Imlan, Samsudin S. Panday, Jaloloden B. Marohom)	

** Projects highlighted in green are competing.

Day 1 Presentations
(November 4, 2021)

Starts	Ends	**Session 1 - Basic Research: Natural Science, Engineering, and ICT**	**Session 2 - Applied Research: Natural Science, Engineering, and ICT**	**Session 3 - Extension and Development**	**Session 4 - Basic and Applied Research: Education and Social Science**
2:20	2:40	S133 - Phenotypic and Genotypic Analysis of Coffea canephora (Robusta) using Morphological and molecular markers (Emma K. Sales, Harem R. Roca, Jeannie R. Binaohan, Rheo Ryan P. Balbuena and Jomarie V. Abubakar)	S214 - Market potential and product acceptability of UF18 cacao variety (Cheryl Y. Dulay, Ivy Mar B. Cabornida, Jigzcel Divine F. Basoy)	S325 - CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful Action) Amidst Covid-19 (Sedra A. Murray, Meriam Rubio, Marivic Candari, Bejian Arellano, Roel Valenton)	
2:40	3:00	S112 - Development of Cost Effective Pests Management for Rubber and Intercrops (Purificacion O. Cahatian)	S205 - Development of Low Cost Tilling Machine for Optimum Vegetable gardening (Joel V. Misanes & Ma. Dely P. Esberto)	S326 -"UBING NGA NAALIBTAK": Fostering Social Resilience Among Grade School Learners Through Moral And Law-based Education (Ivy S. Millare, Roselyn M. Clemen. and Maricar U. Juaneza)	
3:00	3:20	S113 - Disease profile in rubber-based farming system in Southern Philippines (Purificacion O. Cahatian, Joan P. Sadoral)	S207 - Maguindanaon Food Products and Delicacies: Standardization and Promotion for Commercialization (Roy B. Gacus, Francisco Gil N. Garcia, Esmaira G. Gunsayan, Geraldine M. Quiñonero, Merlyn A. Musali, and Leonora M. Silvano)	S314 -USM Wildlife Rescue and Research Center (USM-WRRC0 as Agri-Tourism Destination) (Florence Roy P. Salvaña)	
3:20	3:40	S114 - Land suitability analysis for rubber and its intercrops of the fourteen municipalities of Agusan del Sur (Adeflor G. Garcia, Nephtalie F. Morgado and Richie P. Lador)	S230 - SMART Project Study #5: Development of Data Hub for Smart Agriculture Technologies (Melecio A. Cordero Jr., Jerry T. Piamonte, and Clark Kneil L. Caoile)	S332 - DOST-PCAARRD and USM Agri-Aqua Technology Business Incubator (Pia Amabelle M. Flores, Jalaloden Marohom, and Benjie Mari)	
3:40	4:00		S233 - Upgrading of Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKSARGEN (Francisco Gil N. Garcia, Adeflor G. Garcia3, Purificacion O. Cahatian, Dennis F. Sarmiento)	S333 - USM IP-TBM Phase II: Patent Mining of Rubber Technologies Thru Intellectual Property and Technology Business Management (IP-TBM) Operations of the University of Southern Mindanao (Pia Amabelle M. Flores, Cyrelle M. Besana and Abegail B. Sauyen)	

** Projects highlighted in green are competing.

Day 2 Presentations
November 5, 2021

Starts	Ends	**Session 1 - Basic Research: Natural Science, Engineering, and ICT**	**Session 2 - Applied Research: Natural Science, Engineering, and ICT**	**Session 3 - Extension and Development**	**Session 4 - Basic and Applied Research: Education and Social Science**
8:20	8:40		S222 - Upgrading of Crop Processing center at University of Southern Mindanao (Francisco Gil N. Garcia and Harem Roca)	S329 - Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS-Plans) (Leorence C. Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Benedict Entera, Shandra C. Gonsang, Astrofil Hyde Alcala)	
8:40	9:00	S101 - SMART Project Study # 1: SMART Irrigation System for Plantation Crops through Hyrdrometeorological Monitoring (Willie Jones B. Saliling and Kristine Anne Ramos-Candidier)	S221 - Development of Handbook on Good Agricultural Practices and Marketing Practices for Economically Important Crops in USM (Edward A. Barlaan, Marry Grace S. Balbuena, Jeannie U. Duka, Victor C. Dapon, Helen A. Macailing and Nicko Abestano)	S303 -Integrated Video And Audio Learning Services For Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2021) (Genghis Khan P. Manero, Janice M. Bangoy, Ardniel A. Baladjay, Allan G. Dalo, Jovelyn S. Gesulga, Myrna R. Tan, Jasmin A.	
9:00	9:20	S103 - SMART Project Study #4: Identification Of The Strengths And Limitations Of The Potential Areas For Some High Value Crops (Cacao, Coffee, Cardava-Banana, Longkong-Lanzones, Rubber And Pummelo) In Southern Mindanao (Region 11 And 12) (Rezin Cabantug, Adeflor G. Garcia, Eden Romero and Benjihar Mantis)	S209 - Upgrading of High Value Crops Food Processing Laboratory at University of Southern Mindanao (Sandra Joy P. Pahm and Harem R. Roca)	S305 - HEALS (Health, Environment, Agriculture and Livelihood Skills) for Sustainable Development (2020) (Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Monaira Sumael, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva, Joel V. Misanes)	S421 - Students' Academic Performance Using Online Synchronous And Asynchronous Teaching Modalities (Saima M. Andil, Jikiri M. Entol, Remedios C. Kulidtod, Abdulnasser G. Makalugi, Norjaida D. Maliga, Sofia G. Molao)

** Projects highlighted in green are competing.

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9:20	9:40	S104 - Smarter Approaches To Reinvigorate Agriculture As An Industry-Phase II: SARAI – Enhance Agricultural Monitoring System in North Cotabato (Adeflor G. Garcia PhD., Purificacion O. Cahatian, Romulo L. Cena, Rezin G. Cabantug and Dennis F. Sarmiento)	S223 - Upgrading of Tissue Cultures Facility in University of Southern Mindanao (Mark Al-Jamie J. Muttulani, Harem R. Roca, and Edward A. Barlaan)	S306 - HEEALS (Health, Environment, Education, Agriculture and Livelihood Skills) for Sustainable Development (2021) (Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Tamie C. Solpot, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva, Joel V. Misanes)	S425 - My Parents, My Teachers: Continuing Education Amidst COVID-19 Pandemic (Marcos F. Monderin, Vicente Delos Reyes, Mirasol O. Verona, Khristine Joy Garcia, Rosemarie Sison, Roselyn Clemen)
9:40	10:00	S107 - MECO-TECO Joint research project: Improvement of 'Carabao' mango fruit quality and production through development of molecular markers for scab and stem-end rot resistance by genome wide association studies (GWAS) (Edward A. Barlaan, Joan P. Sadoral, Joellee L. Aguirre, Jeralden O. Vido)	S224 - Upgrading Of Cacao Post-Harvest Processing Center At The University Of Southern Mindanao (Harem R. Roca and Sheena B. Lucena)	S307 - SMART Project #7: SMART Technology Transfer for High Value Crop Stakeholders (Adniel A. Baladjay, Janice M. Bangoy, and Adeflor G. Garcia)	S426 - Educational Innovations in Rural And Remote Communities: A Multi-Dimensional Approach (Leorence C. Tandog, Debbie Marie Verzosa, Bonifacio Solsoloy, Joy Gloria Sabutan, Astrofil Hyde Alcala, Shandra Gonsang, Benedict Entera)
10:00	10:20	S108 - Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genom-wide Association Studies (GWAS) (Edward A. Barlaan and Emma K. Sales)	S203 - Development and Evaluation of Automated System for Profiling of Student Organizations in the University of Southern Mindanao (Yvonne V. Saliling, Geraldine M. Quiñonero, Paul John B. Ongcoy, Ryan Z. Gonzaga)	S308 - Establishment of Urban Agriculture at University of Southern Mindanao (Joan P. Sadoral, Purification O. Cahatian, Adeflor G. Garcia)	S428 - Matya Tanu (Magbasa Tayo) (Shandra C. Gonsang, R.Sison, ML Calibayan, W.Aquino, N.Du, FM Reyes, N.Pabinal, R.Sugadol & B.Wali)

** Projects highlighted in green are competing.

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10:20	10:40	S111 - Selection For Glyphosate Tolerance And Corn Borer Resistance In Corn Segregating Populations (Jessie G. Elarde, Edward A. Barlaan)	S206 - Development of Rapid Technique for Analysis of Adulterated Wholesome Food Products: A combination of Spectroscopy and Chemometrics for Halal Food Analysis (Frederick John B. Navarro and Queennie G. Llera)	S309 - Production Of Tissue-Cultured Banana (Saba/Cardava) Planting Materials (Harem R. Roca, Jane R. Desamito, Carl Jonas D. Gocotano, Analyn V. Matutis, Janine Joyce F. Develleres, Raffy James P. Balancio, Gelan Mae S. Tudlas And Esmael I. Molero, Jr.)	S434 - Coffee Table Book: Dokumentasyon Ng Mga Mahahalagang Bagay At Tagpo Sa Buhay Ni Bai Hadja Fatima Matabay N. Plang -MIT-USM Founder (Shandra C. Gonsang, Meriam M. Rubio and Radji A. Macatabon)
10:40	11:00	S130 - Development of Innovative approaches for clonal propagation of industrial and fruit crops (Sheena B. Lucena, Ferdinand A. Duldulao and Edward A. Barlaan)	S208 - Development, Standardization and Packaging of Nutri-foods for Emergencies (Jigzcel Divine F. Basoy, Ivy Mar B. Cabornida, Maribelle T. Piamonte, Leila S. Moscoso, & Urduja G. Nacar)	S311 - COMMUNITY BASED DEVELOPMENT and ECONOMIC MAINSTREAMING (CBDEM) on promotion of Halal Food Products (Analyn A. Gonzales Jul-Aida U. Enock Metche Anne C. Logronio Jeannie U. Duka Mitzi Aileen M. Alba Charisse Angela S. Quiambao)	S430 - Establishing Baseline Agriculture Performance And Rural Development Indicators From A Governance Perspective (Francisco Gil N. Garcia, Geoffray R. Atok, Jalaloden B. Marohom, Nerissa G. Dela Viña and Jennet R. Mag-aso)
11:00	11:20	S121 - Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables (Purificacion O. Cahatian, Maria Irinea S. Candolita and Naomi G. Tangonan)	S225 - Effective Rubber-based cropping system in Agusan del Sur and North Cotabato (Adeflor G. Garcia and Linda Buquir)	S301 - Implementation of Upgraded Consultancy Services and Technical Assistance for MSMEs through Consultancy for Agricultural Productivity Enhancement (CAPE) Program (Ardniel A. Baladjay, Edward A. Barlaan, Mary Joy S. Cañolas, Janice M. Bangoy)	S431 -Study on the Utilization of Marang Fruit (Artocarpus Odoratissimus Blanco) and Assessment of Fruit Production In Mindanao (Norma U. Gomez and Roy Gacus)
11:20	11:40	S132 - Validation Of Molecular Markers For Identification Of Cacao HYVs, Criollotypes And Disease Resistant Varieties Through Marker-Assisted Breeding (Edward A. Barlaan, Amy E. Elivazo and Allen Jay E. Austria)	S226 - Developing Robust Diagnostic Tools and Effective Chemical Formulation for Rubber and Companion Crops to Improve Rubber Productivity (Adeflor G. Garcia, Johnvie B. Goloran, Mel Chrisel A. Sales, Oscar J. Jurado and Argie P. Casis)	S322 - SOXAARRDEC: Kaagapay ng Magsasaka sa Krisis at Kalamidad (KMKK) (Elizabeth C. Molina, Adrniel A. Baladjay, Siony Brunio, and Analyn Derequito)	S424 - Intermediate Teachers' Competence And Readiness in Teaching Writing in the English Language (Marcos F. Monderin, Reizelle Mae C. Amilbahar, Rhodora A. Melgar, Lawrence Anthony U. Dollente, Jerose L. Molina, Marlyn A. Resurreccion, and Khadiguia O. Balah)

** Projects highlighted in green are competing.

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11:40	12:00		S227 - NICER Project #1 - Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Productivity and Profitability (Edward A. Barlaan, Cris Harvin Rey G. Calvo, Alvin John R. Quitel, Elcy Jane C. Naquitquitan, Kristine D. Paguntalan)	S324 - CED Cares (Community Assistance thru Research and Extension Services): Development and Utilization of Flexible Teaching Guides in Science (Ellen Joy M. Farala, Bailyn M. Mantawil, Faith P. Buned)	S422 - Development of On-Line Educational Contextualized and Indigenized Instructional Material Supplementing IP Quality of Education (Amme Rose L. Blonto-Nonol)
12:00	1:00	LUNCH BREAK	LUNCH BREAK	LUNCH BREAK	LUNCH BREAK
1:00	1:20	S126 - USM-Treelife Biotechnology Development Program: Isolation And Molecular Characterization Of Potential Plant Growth Promoting Microorganisms From Coconut Industry Waste (Maria Elena N. Tanabe, Cromwel M. Jumao-as & Jerry John M. Taray)	S228 - NICER Project #2 - Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement (Gwen Iris D. Empleo, Ivy M. Pasquin, Jeannie R. Binaohan, Avigel I. Cabrillos, Engela Maricris Gaoiran, Ryan C. Eder)	S335 - University Of Southern Mindanao Futures Thinking For Food Security, Systems, Innovations And Sustainability (Francisco Gil N. Garcia, Edward A. Barlaan and Ma. Teodora N. Cabasan)	S423 - Tracer Study Of The University Of Southern Mindanao Criminology Graduates (Richard T. Camara)
1:20	1:40	S128 - Productivity Of Crossbred Sheep And Goats Fed Brachiaria Hybrid cv. Mulato Ii (Brachiaria Ruziziensis X B. Brizantha X B. Decumbens) Fertilized With Varying Levels Of Nitrogen (Josephine R. Migalbin, Roy C. Ricabar, Julius Jerome G. Ele, Geoffray R. Atok, Jurhamid C. Imlan)	S229 - NICER Project #3 - Development Of Optimized Post-Harvest Processing Approaches For Improved Quality Of Cacao Beans (Renel M. Alucilja, Maricel G. Dayaday, Ritchell Joy T. Cuarteros, May Nards Y. Penales, Sheena B. Lucena, Jayson S. Baltazar, Sanshine O. Lacsao, Lydia C. Pascual, Keith Bryan V. Marcelino, Lawrence Dhaniel L. De Jesus)	S327 - Teacher Nanay: Mothers Today, Teachers Tomorrow (Glyn G. Magbanua, Shandra Gonsang, Erwin Mallo, Jerose Molina, Sofia Loren Neyra, Maricar Juaneza, Mariz Balquin, Vicente Delos Reyes)	S427 - Enhancing Ethics, Professional Responsibility And Lifelong Learning Competence Of Engineering Students Through Outcomes-Based Teaching And Learning (OBTL) During Pandemic (Kharlo J. Subrio)

** Projects highlighted in green are competing.

Day 2 Presentations
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1:40	2:00	S115 - Etiological Studies and Integrated Disease Management of Major Diseases of Dragon Fruit (Jasmin A. Pecho, Ardniel A. Baladjay and Samsudin S. Panday)	S232 - SMART Project Study #2: Smart Soil and Nutrient Management using Sensor Technologies to Increase Productivity of High Value Crops at the University of Southern Mindanao (Adeflor G. Garcia, Sheena B. Lucena, Jessie G. Elarde, Carlo D. Bacus)	S328 - English Language Intensive Training for Excellence (ELITE) (Roel A. Naringahon, Marlyn A. Resureccion, Lloyd Anton Von M. Colita, Ana Marie B. Uyangurin and Edna Luz T. De Guzman)	S433 - Supply Chain Analysis of Pummelo in Selected Regions of the Philippines (Joeteddy B. Bugarin and Kathleen Ivy Z. Bolotaolo)
2:00	2:20	S123 - Collection, Evaluation And Maintenance Of Cut Foliage And Flowering Pot Ornamentals At USMARD Center (Nancy E. Duque and Lorelyn Joy N.Turnos)		S331 - EEnhancement Of Enterprise, Marketing And Financial Practices Among Registered Tricycab Drivers And Owners (TDO) Of Kabacan (Analyn A. Gonzales, Jalaloden B. Marohom, Mitzi Aileen M. Alba, Neressa G. Dela Viña, Cheryl Y. Dulay)	
2:20	2:40			S336 - Capability Building of Rubber Stakeholders and Role of Women and their Children in Natural Rubber Industry in Agusan del Sur (Mary Rodelyn Cariaga and Razel O. Montemor)	
2:40	3:00				

** Projects highlighted in green are competing.

10:00 – 10:20

S102-Development of Weather-Based Forecasting Tool Through Simulation and Modeling as Early Warning System for Integrated Pest Management for High Value Crops

Purificacion O. Cahatian, Marilyn S. Painagan, Joseph S. Quisado and Joan P. Sadoral

ABSTRACT. This study was conducted to develop a forecasting tool that will forewarn the farmers of the possibility of occurrence of the major insect pest and diseases of coffee, cacao, rubber, lanzones, cardava banana and pomelo. The input parameters in the development of the forecasting tool were climatic data and the population of major insect pests and natural enemies and the incidence of diseases of coffee, cacao, rubber, lanzones, cardava banana and pomelo. The observation and collection of coffee leaf rust and berry borer, pomelo sooty mold and rind borer, rubber anthracnose leaf spot, cacao pod rot and pod borer, lanzones leaf blight and mussel scale insect, banana black sigatoka, banana flower thrips and natural enemies as well as the real time climatic data were done at the University of Southern Mindanao, Kabacan, Cotabato. The forecasting tool was developed using the feed- forward neural network. A back propagation method was used in the optimization of the parameter's weight and a gradient descent which is an optimization algorithm was used in finding the value of the coefficients through one thousand times iterations. The forecasting algorithm was calibrated using the actual field data of the input parameters from February 2021 to October 2021. The calibrated forecasting algorithm was tested by simulating the actual field data that were set aside for simulation from the same range of months. Results showed a best fit between the actual and predicted values of citrus rind borer with an average error prediction of 0.32, a good fit for coffee berry borer, cacao berry borer, lanzones leaf blight, banana black sigatoka, rubber corynespora leaf fall, and cacao pod rot, with an average error prediction of 1.25, 2.21, 2.35, 5.51, 5.44, and 7.31 respectively. On the other hand, large error prediction was shown between the actual and predicted values of banana flower thrips with an average error prediction of 22.64. For grouped discrete data outputs, results showed large error prediction for coffee leaf rust with 5 correct predictions out of 14 instances, pomelo sooty mold with 6 correct predictions out of 17 instances, and lanzones mussel scale insect with 4 correct predictions out of 10 instances. 3 For the natural enemies, large values of prediction error were shown between the simulated and predicted population of *Chilocorus circumdatus, Chilocorus nigrita* and *Telsimia nitida* with an average error prediction of 34.8, 16.63 and 243.1, respectively. Based on the forecasting results, it can be concluded that the weather-based forecasting tool for pests and diseases for high value crops that was developed is capable of forecasting the population dynamics of pests, natural enemies and diseases. To fine-tune the forecasting results it is recommended to add more datasets of pests and diseases.

Keywords: Weather-based forecasting; Early warning system; pests; natural enemies; diseases; forecasting algorithm

10:20 – 10:40

S109- Comparative Analysis of the Biochar Derived from Rice Straw, Rice Husk, Corn Stalks, Corn Cobs and Oil Palm Empty Fruit Bunch on Soil Water Retention Capacity and Development and Growth of Pechay (*Brassica rapa* subsp. Chinensis)

Tito Jun T. Tidula and Rezin G. Cabantug

ABSTRACT. Biochar enhances marginal soil productivity, reduces fertilizer use and sequesters carbon and thereby minimize climate change. There is a challenge in producing biochar due to availability of equipment, which portable and easy to operate. This project aimed to develop retort for biochar production of agricultural wastes such as rice hull, rice straw, rice husks, corn stalks, corn cobs and oil palm empty fruit bunch (EFB). The physical and chemical characteristics of biochar such as bulk and particle density, porosity, pH, ash content, nitrogen and phosphorous were determined. Further, the effect of biochar on soil water retention capacity and growth of pechay were established. The project successfully fabricated a retort that able to produce biochar from rice straw, rice husks, corn stalks, corn cobs and oil palm EFB. Trial recorded a maximum temperature of 538°C with no deformation occurred. Biochar produced from rice hull showed the highest bulk and particle density with 311.12 and 518.93 kg/m3, respectively. Biochar from corn stalk has the highest porosity of 68.90%. Chemical analysis revealed a significant result on biochar produced from rice straw biochar having a highest pH and nitrogen content of 10.01 and 1.27%, respectively. Biochar from rice hull has the highest ash content (43.98%) while the empty fruit bunch biochar showed the highest phosphorous content (0.27%). Pot experiment revealed that increasing the amount of biochar into soil increased the soil water retention capacity except for biochar produced from oil palm EFB. However, increasing the amount of biochar from EFB into soil increases the soil moisture loss. Determination of the effect of biochar on the growth of pechay is on-going.

Keywords: agricultural waste, carbonization, chemical characterization, retort, water retention capacity

10:40 – 11:00

S125- Screening of Plants from Region XII with Potential Anticancer Activity

Loveille Jun A. Gonzaga, Harem R. Roca, Francisco Gil N. Garcia and Lydia C.Pascual

ABSTRACT. Cancer is the leading cause of death globally. Scientific research showed significant results in the utilization of plants, plant products, and their analogues as potent anticancer agents that are effective and safe in the management of cancer. Thus, the current project targets in establishing a Tuklas Lunas Development Center (TLDC) that specializes in the discovery of anticancer agents from plants found in Region XII. Primarily, it aims to produce bioactive non-toxic plant crude extracts that have potential anticancer properties against various cancer cell lines. Setting-up and optimization of the TLDC facility are almost done since most of the equipment, reagents, and supplies have already been delivered. A total of forty-four (44) plant samples have been collected so far. These undergone laboratory processes, from washing, drying, grinding, soaking, filtration, and extraction using rotary evaporator. To date, 30 plant species have been extracted ready for cell-based assays. Currently, the project

is also doing cell culture and proliferation of colorectal cancer cells, HCT 116 for MTT and scratch wound healing assay

Keywords: cell, cancer, plant, crude extract, bioassay

11:00 – 11:20

S122-Screening of Potential Endophytes as Biocontrol Agent against Major and Emerging Leaf Diseases of Rubber

Tamie C. Solpot, Bernadith T. Borja, Ma. Teodora N. Cabasan, Melesa N. Prado and Jomarie Abubakar

ABSTRACT. Rubber production is a profitable agro-industrial venture in the Philippines. However, pests and diseases are major constraints in rubber production resulting in lower latex yield, death of rubber plants, and high production cost. There are some control measures for pests and diseases of rubber. Biological control has been suggested as the most sustainable long-term solution and a direction towards a safe and environment-friendly measure. The objective of this project is to identify potential endophytes for biofungicide to control major and emerging leaf diseases of rubber. On the first six months of the project (year 1), the occurrence and prevalence of major and emerging leaf diseases of rubber in North Cotabato were determined. Endophytic fungi of rubber associated to leaves and barks were also isolated simultaneously for potential use as biocon agent against rubber diseases. Twenty-five (25) rubber farms from five major rubber-producing municipalities of North Cotabato (Kidapawan, Antipas, Makilala, Matalam, and President Roxas) were assessed for rubber leaf diseases and other basic farm information and practices employed were also surveyed. There were eight leaf diseases of rubber observed in this study, with six (6) already known and reported in the country, while two (2) are unidentified. Powdery mildew occurred in all the rubber plantations in North Cotabato. Colletotrichum leaf spot and Corynespora leaf spot occurred in 84% and 56% of the rubber plantations surveyed, respectively. Phytophthora leaf blight, Algal spot, and Bird's eye spot occurred in 16%-20% of the rubber plantations. Highest % disease index (DI) for Colletotrichum leaf spot was recorded in the municipality of Kidapawan while the highest % DI of Corynespora leaf spot was observed in President Roxas but not present in the rubber plantations of Matalam. The Irregular leaf spot disease is most noticeable in Antipas (average DI= 33.2%) where almost 50% of the trees sampled had this symptom. This disease is more pronounced in Matalam and President Roxas. Of all the leaf diseases in rubber, Powdery mildew was the most evident in rubber plantations surveyed. Among the 25 rubber plantations surveyed, Antipas has the highest disease index on rubber leaves and the least in Kidapawan, North Cotabato. Distribution of these diseases in North Cotabato were mapped out for disease surveillance and can be used by the farmers, technicians, and policy makers in the future. Healthy rubber leaves were collected for the isolation of endophytic fungi. A total of 142 isolates were produced in pure culture for characterization and bioassay on the next work package.

Keywords: Disease index, incidence, distribution, endophyte, severity

1:00 – 1:20

S124- Evaluation and characterization of ten promising varieties of cacao in Type II and III agro-climatic zones in Northern and Southern Mindanao

Chris Harvin Rey G. Calvo, Gwen Iris D. Empleo, Romulo L. Cena, Sheena B. Lucena and Jayson S. Baltazar

ABSTRACT. Field experiment was conducted to determine the adaptability and performance of ten promising cacao varieties in the University of Southern Mindanao, Kabacan, Cotabato. The experiment was laid out in RCBD with three replications in 3m x 3m planting distance following Good Agricultural Practices (GAP). Planting survival ranged from 80-100% in the field. W10 was found to be earliest to flower (8.7 MAP), cherelle onset (16.42 MAP) and pod onset (22.57 MAP). Significant differences were observed for leaf, flower, pod and bean characteristics among 10 varieties. Leaf shoot color ranged from light green to dark red and ovate leaf shape was predominant among varieties. CCN 51 was found to have the biggest pod with pod length (232.81 mm) and pod width (101.62 mm). Significant differences were also observed for yield components among the varieties tested. PG610 was found to have the greatest number of beans per pod (45.53) and lowest pod index (16.92). Furthermore, W10 had the most number of pods harvested per tree (38.24) and pod index (18.60) which is at par with check variety BR 25 with 46.58 and 33.58 respectively. Results showed there is a great morphological diversity among the promising varieties which can be used for germplasm collection and future cacao breeding and improvement. Moreover, varieties with good yield performance can be recommended for registration to NSIC and varietal release

Keywords: Cacao varieties, growth, yield, morphological characteristics

1:20 – 1:40

S110-Diversifying the Utilization of Corn as Food and Silage for Food Security

Efren E. Magulama, Nenita E. Olero, Jurhamid C. Imlan, Ivy Mar B. Cabornida, Jessie G. Elarde and Joanne E. Duran

ABSTRACT. The project aimed to create diversified product options of USM developed corn varieties in support to food security. Among corn varieties and its corn-rice-mix proportions evaluated, USM var 6 and Glutinous showed 100% acceptability by the respondents in all rice-corn mixture ratios (25/75 and 30/70 and 50/50). USM var 10 showed 100% acceptability by respondents in 30/70% and 50/50 ratios. USM var 24, however, exhibited 100% acceptability in 25/75 ratio. Of the 16 corn genotypes evaluated for baby and green fodder corn, seven genotypes were identified and selected as potential for baby and green fodder corn production. Among the green corn varieties, USM Glu #1 showed higher green yield when applied with agar-agar and K-humate 100 S soil enhancers showed higher green yields. Higher percent ear marketability (89-91%) of green corn was noted when corn plants were applied with bio-organica and agar-agar soil enhancers. Among the three yellow varieties tested for silage, USM Var 5 had higher herbage yield compared to the two hybrids. The silage evaluation for animal is still on going. The seed maintenance and seed increase of USM varieties are

currently on going to provide quality seeds for the farmers. A total of 300 half-sib families of USM Var 5 and 150 of USM Var 6 were generated as breeder seeds. Parent lines of the two hybrids were continuously purified in support for the technologies being commercialized to the two private companies.

Keywords: Genotypes, soil enhancers, baby corn, green fodder, and green corn

1:40 – 2:00

S127- Prevalence and Molecular Characterization of Gastrointestinal Parasites in Human-Macaque Interface: The case of Hindang, Leyte and New Israel, Makilala, North Cotabato

Lothy F. Casim, Leanne Jay S. Manceras, Cyrelle M. Besana, Fritzie S. Sia and Rheo Ryan P. Balbuena

ABSTRACT. Long-tailed macaques are known to interact with people in human-habituated environment. These interactions are oftentimes observed in tourist areas such as in parks where
visitors feed long-tailed macaques for entertainment. However, this practice could not only affect the ecology of the species, but also increases the possibility of disease transmission from zoonotic parasites. Thus, this study aims to investigate the occurrence of gastrointestinal parasites (GIT) in human-macaque interface of New Israel, Makilala and Hindang, Leyte, using One Health approach. Prevalence and intensity of parasites in long-tailed macaques, residents and environment will be investigated by means of non-invasive parasitological techniques (FEACT, floatation and microscopy). The study will also deal with the assessment of associated risk factors and the possible cross transmission of parasites using conventional and molecular techniques. From the identified sampling points in Hindang, Leyte, 30 fecal samples were collected from synanthropic macaques but only 4 samples were recovered from forest-confined troops due to the treacherous terrain of the study site. Nineteen (19) fecal samples were collected from residents living near Hindang Nature Park. There was a total of 9 GIT parasites identified, eight (8) protozoans (*Balantidium coli, Blastocystis* sp, *Endolimax nana, Entamoeba coli, Entamoeba hartmanni, Entamoeba histolytica, Entamoeba polecki*, and *Iodamoeba butschlii*) and one (1) helminth (hookworm) species. Though all synanthropic and forest confined macaques were found to harbor one or more protozoans, most protozoan species identified were non-pathogenic. However, this study was able to identify 3 pathogenic protozoans (Balantidium coli, Blastocystis sp. and Entamoeba histolytica) in macaques and a pathogenic helminth (hookworm) both in human participants (5.26%) and macaques (synanthropic (3.33%); forest confined (25%)). Of the identified protozoans, *Endolimax nana* (100%), *Entamoeba polecki* (100%), *Iodamoeba butschlii* (100%) and Entamoeba coli (93.3%,100%) were the most prevalent in both macaque troops. For the environmental samples, the collected soil samples were already processed and will be subjected to microscopy while the water samples were preserved and will be processed once the filtration device is available.

Keywords*:* macaque, human, GIT parasites, FEACT, microscopy

2:00 – 2:20

S131- Pilot Testing and Validation of SSR Marker Kit for Philippine Mango Germplasm in Commercial Mango Nurseries

Emma K. Sales, Marry Grace S. Balbuena, Jane R. Desamito, and Avigel I. Cabrillos

ABSTRACT. The Philippines ranks sixth among the mango producers in the world with combined exports of fresh, dried and processed mangoes. Among the different cultivars grown in the country, 'Carabao' or Manila Super mango is the prime export variety due to its perfect blend of sweetness and sourness and its luscious aroma. Of this popular cultivar, there are 3 known strains namely "Lamao" of Central Luzon, "Carabao Gold" of MMSU, "Sweet Elena" of Zambales and Guimaras. However, many other varieties are also being cultivated and there is a strong suspicion of mislabeling in some commercial nurseries. Therefore, there is an urgent need to address such problem. The cultivars commercially propagated need to be accurately identified and certified true-to-type to avoid jeopardizing the integrity of the nursery where they emanated. A previously completed PCAARRD funded project had determined the robustness of several SSR markers. This study was done to evaluate the accuracy and efficiency of selected SSR marker kit and to validate carabao mangoes and other mango collections planted in different nurseries and clonal gardens. A comparison on the accuracy and efficiency of the selected SSR markers was done between the previous and the recent study. The following results were obtained: both carabao strains and non-carabao varieties gave an ideal and acceptable PIC value of not less than 0.5 similar with the results of the previous study. Likewise, both studies showed high PD values. The previous and recent study also identified six primers AY942817, AB190345, AJ938175, AY942827, AJ635184, and AJ635176 that generated similar unique alleles and detect the same cultivars. Result of the study showed that the marker kit developed is efficient specifically in terms of its efficiency and utility. It also confirmed that the selected primers are efficient and can be utilized a diagnostic marker in
discriminating mango strains. SSR marker kit was also used to validate samples collected from different nurseries and clonal gardens. Based on the molecular analysis done, 9 out of 26 nurseries had mislabeled varieties. The said varieties were then properly identified and labeled using the selected marker kit. Validation of the true genetic identity of recommended varieties/strains is indeed valuable in ensuring that only the preferred and high-quality planting materials are dispersed. This then will ensure that only the genuine varieties or strains are used in either the expansion of mango nurseries and mango orchards. The use of the developed SSR marker kit for mango had proven its utility in discriminating the different varieties. This also paved the way for the validation of the existence of mislabeled varieties and confirmation as to its true genetic identity as well as in identification of the unidentified planting materials in the germplasm.

Keywords: Mango, SSR markers, commercial mango nurseries, DNA analysis

2:20 – 2:40

S133- Phenotypic and Genotypic Analysis of *Coffea canephora* (Robusta) using Morphological and Molecular Markers

Emma K. Sales, Harem R. Roca, Jeannie R. Binaohan, Rheo Ryan P. Balbuena and Jomarie V. Abubakar

ABSTRACT. A research project was conducted to determine the phenotypic and genotypic analysis of *Coffea canephora* (Robusta) using morphological and molecular markers. Both strategies were utilized with the following objectives: a) Inventory and collect Robusta coffee abounding in Region XII for DNA Diversity Analysis; b) Develop protocols for Robusta coffee molecular analysis; c) Screen and evaluate existing SSR markers for Robusta coffee; d) Develop/establish database of molecular characteristics and population structure of Robusta coffee cultivars. A total of ninety-five (95) Robusta coffee samples were collected from Mindanao and other parts of the Philippines. However, only twenty (20) Robusta coffee samples were characterized based on qualitative and quantitative traits because the other samples are still in the nursery stage. For molecular analysis all of the 95 samples were assessed. Sixty-four SSR Primers were screened for their utility. Out of these, 16 SSR primers gave DNA Amplification with polymorphic bands based on the molecular analysis done. Principal Component Analysis (PCA) revealed that bean length, bean width and bean thickness were the predominant characters that distinguish the variability among traits. Cluster analysis grouped the twenty (20) Robusta coffee samples into five (5) clusters based on morphological characteristics. The most variable morphological qualitative traits were color characters and bean-related traits for quantitative analysis. From the molecular analysis, SSR markers revealed the minimal variation among the Robusta coffee strains. A dendrogram based on using UPGMA generated by Jaccard's coefficient was developed. The result of molecular analysis using DI, PD and PIC showed that all SSR primers are useful and efficient in distinguishing the samples. Identity of the Robusta coffee in the different commercial nurseries were detected using SSR markers and the unidentified or mislabeled planting materials were identified and labelled as to their true identity.

Keywords: Robusta Coffee (*Coffea canephora*), Morphological Characteristics, Molecular Analysis, SSR Markers, Dendrogram

2:40 – 3:00

S112- Development of Cost-Effective Pest Management for Rubber and Intercrops

Purificacion O. Cahatian, Lira May A. Sibongga and Merrian Mae Diwa Paule

ABSTRACT. A study was conducted to assess and identify insects of rubber and intercrops; and to compare insect profiles of different rubber-based cropping systems and to evaluate management strategies for rubber annual intercrops, at University of Southern Mindanao Agricultural Research Center (USMARC). Insect assessment for rubber and perennial intercrops (banana, lanzones, cacao and coffee), and annual intercrops (eggplant, corn and mungbean) was carried out from Jaunary to September 2021. Results of the study revealed that almost similar insects were found infesting rubber across different cropping systems: rubber + banana

+ annuals, rubber + lanzones + annuals, rubber + cacao + annuals, rubber + coffee + annuals, and rubber monocrop. Insect pests of rubber as a monocrop, and intercropped with perennials and annuals have similar insect profile, except for the Rubber+Banana where Spiralling Whiteflies were observed. The insect pests of rubber in all models include: 2 species of scale insects, pachyrrhynchid beetles, click beetle, bark borers and bagworm. Insect pests of mungbean as an intercrop across all rubber-based farming system models were similar and include: Black Bean Aphids, Green Soldier Bug, Bean Pod Borer and Thrips. Similarly, insect pests of corn as an intercrop across all rubber-based farming system models were similar and include: Corn Aphids, Corn Plant Hopper and Fall Armyworm. Moreover, eggplant have similar insect profile across all models. Insects of eggplant assessed include: Aphids, Cotton Leafhoppers, Whiteflies and Eggplant Shoot and Fruit Borers, and twig borers. For perennial intercrops, insect pest profile of cacao was almost similar in all models except for the Cacao+Corn, where Nettle Caterpillars were observed. The insect pests common across all models include: Pachyrhynchid beetles, June Beetles, Chrysomelid Beetles and mealy bugs. For coffee as an intercrop, the three models: Coffee+Eggplant, Coffee+ Cassava and Coffee+ Mungbean had similar insect profile which include: Pachyrrhinchid beetles, Mealybugs and Scale insects, while for the Coffee+ Corn model, only one insect was assessed, which is the Pachyrrhinchid beetles. Moreover, for Lanzones as a perennial intercrop, three cropping models, Lanzones + Corn, Lanzones+ Cassava and Lanzones+ Mungbean have only one and similar insect, the Pachyrrhinchid beetle, while the Lanzones+ Eggplant model had three insect pests: Scale Insects, Pachyrrhinchid Beetles and Aphids. Finally, for the Rubber+Banana model, pest profile include: Pseudostem weevil, lace bugs and mealybugs. On the other hand, evaluation of management strategies for insect pests of corn an eggplant using two botanical extracts, revealed the potential of Botanical Extract 2 for the control of Eggplant Fruit and Shoot Borer and Fall Army Worm. Moreover, for the management of major insect pests of eggplant, six treatments were evaluated namely: Untreated Control, Neem Leaves Extract, Curry leaves Extract, Aktrine (Treated Control), Pyro Solution (Commercial Organic Pesticide) and Farmers' Practice (Synthetic Insecticide). For Eggplant Fruit and Shoot Borer, all the treated plants had significantly lower percent infested shoots compared to the untreated control. For the total number of Eggplant Twig Borer, no significant difference was observed among treatment means, however, for the total number of infested plants, Curry Leaves Extract showed potential since it is comparable with the Farmers' Practice (Synthetic Insecticide). For the yield of eggplant, no significant difference was observed on the weight of eggplant fruit, however, promising results were observed for the number of fruits with borer, population count of borer, weight of fruits with borer, wherein all the treated plants had significantly lower results compared to the untreated control.

Keywords: rubber, annual intercrops, perennial intercrops, pest profile, pest management in rubber, pest management in rubber intercrops

3:00 – 3:20

S113-Disease Profile in Rubber-based Farming System in Southern Philippines

Purificacion O. Cahatian, Joan P. Sadoral, Armando G. Valiente, Marife T. Andoy and Merrian Mae D. Paule

ABSTRACT. A study was conducted to assess and identify diseases of rubber and intercrops; and to compare disease profiles of different rubber-based cropping systems at University of Southern Mindanao Agricultural Research Center (USMARC) from December 2019 to present. Disease assessments for rubber and perennial intercrops (banana, lanzones, cacao and coffee), annuals such as cassava and eggplant, and corn and mungbean were carried-out at four, two and one week interval, respectively. Results of the study revealed that almost similar diseases were found to infect rubber across different cropping systems: rubber + banana + annuals, rubber + lanzones + annuals, rubber + cacao + annuals, rubber + coffee + annuals and rubber monocrop. Disease assessments from January to August 2021, disclosed that the most prevalent diseases across different cropping sysytems are algal leaf spot, powdery mildew and wrinkle spot-like disease. Moreover, perennial intercrops were affected with the occurrence leaf diseases such as sigatoka, freckle and cordana in banana; rust, algal spot, athracnose, leaf blight and sooty mold in coffee; leaf blight in lanzones; and leaf spot and blight in cacao. Leaf diseases were also found to infect annual intercrops such as cassava, eggplant, corn and mungbean.

Keywords: disease assessment, disease identification, crop diversification, management approaches

3:20 – 3:40

S114-Land Suitability analysis for rubber crops in Agusan del Sur

Adeflor G. Garcia, Nephtalie Morgado and Richie P. Labor

ABSTRACT. The opportunities , potentials and limitations of a parcel of land can be evaluated by using different tools such as multiple criteria evaluation , analytical hierarchy process in a GIS platform. A study on the land suitability analysis of the fourteen municipalities of Agusan del Sur is currently conducted to characterize the key soil constraints and identify the most suitable lands for establishing rubber-based cropping systems for long term sustainability. The study also aims to create the soils, slope, elevation, fertility and suitability maps for the thirteen municipalities and 1 city of Agusan del Sur. Furthermore, a database will be established for the soil pH, rooting depth, N, P, K, electrical conductivity, exchangeable bases, cation exchange capacity, and base saturation. The base map of Agusan del Sur has been delineated using the base map of the National Mapping Resources Information Authority (NAMRIA) . A total of 816 grids were identified to be sampled considering the slope, elevation and soils types . All soil samples were sent to Griffith University , Australia for the laboratory analyses. The fourteen (14) suitability maps for rubber has been created for the use of the municipal local government units and one city. The thematic maps created were: slope , elevation, soil series/types maps of the municipalities and one city. The rainfall and

temperature map were created using the 30 – year world climate data. A seminar-workshop was conducted for the Office of the Provincial Government for the interpretation of the soils map of the province of Agusan del Sur. A series of seminar-workshop are scheduled for the different municipal agriculture offices for the interpretation and use of the different thematic maps created for their respective municipalities.

Keywords: suitability, Agusan del Sur, rubber, GIS, AHP

8:40 – 9:00

S101-Project 1: SMART Irrigation System for Plantation Crops through Hydrometeorological Monitoring

Willie Jones B. Saliling and Kristine Anne C. Ramos-Candidier

ABSTRACT. This project intends to develop a precise irrigation system framework by deciphering the complex relationship of yield response, on-farm patterns of temperature, humidity, rainfall and soil moisture. Plantation crops such as rubber, banana, coffee, cacao, and lanzones are highly sensitive to rainfall, soil moisture, and humidity. But since these crops are usually grown in a rainfed environment, growers are at the mercy of the weather which held them helpless. Better water management through precise irrigation is seen as a panacea of the farmers' woes. Since January 2021, this project has developed the systems design for the irrigation plots for the six commodities. The layout of the irrigation system was sketched along with the data acquisition and control points. Automation sensor control for NPK, humidity, temperature, soil moisture were integrated with the design of the data hub infrastructure networks. Meanwhile, the regional pedoclimatic maps were also done to refine the data analysis at the plot-scale. It is hoped that upon commissioning of the irrigation systems, sensor, and controls, robust tdata analytics can be employed for better water management towards optimal yield.

Keywords: drip irrigation, SMART Agriculture

9:00 – 9:20

S103- Identification of the Strengths and Limitations of the Potential Areas for Some High Value Crops (Cacao, Coffee, Cardava-Banana, Longkong-Lanzones, Rubber and Pummelo) in Southern Mindanao

Rezin G. Cabantug and Adeflor G. Garcia

ABSTRACT. While global production is still low to accommodate the increasing demand for food, with pressing concerns in land utilization and nutrient management in the country. Conversion of agricultural land to commercial, industrial and housing units were even getting larger than crop production. The establish the capability potentials, limitations and constraints of each production areas and capacitation of LGU's towards enhanced productivity and sustainability of High Value Crops in Southern Philippines was conceptualized. Pre-mapping was conducted for region 11 and 12 with 606, 834.15 hectares undifferentiated mountain soils

verified. There were 165 thematic maps generated from elevation, slope, land use, rainfall, and temperature which are now available in the Land and Water Resources Management Information website of the project. Fourteen (14) high value crops coordinator and technicians were trained on the use of the different generated thematic maps, and capacitated on the advance technologies such as ArcGIS, QGIS and SW Maps software for their programming and monitoring activities.

Keywords: Crop suitability, high value crops, soil series, soil survey, land use

9:20 – 9:40

S104-Smarter Approaches to Reinvigorate Agriculture as an industry-Phase II: SARAI – Enhanced Agricultural Monitoring System in North Cotabato

Purificacion O. Cahatian, Romulo L. Cena, Rezin G. Cabantug and Dennis F. Sarmiento

9:40 – 10:00

S107- Improvement of Carabao Mango Fruit Quality and Production through Development Molecular Markers Associated with Scab and Stem-end Rot Disease Resistance by Genome Wide Association Studies (GWAS)

Edward A. Barlaan, Joan P. Sadoral, Joelle L. Aguirre and Jeralden O. Vido

ABSTRACT. Declining production yields and poor quality of Philippine 'Carabao' mango fruit had been a challenge and mainly attributed by high pest and disease pressure i.e stem-end rot and scab disease. The study was conducted to generate molecular markers associated with scab and stem-end rot resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utilization in marker-assisted breeding in 'Carabao' mango. Different mango accessions were tagged and evaluated for their resistance to stem-end rot and scab disease. Twenty-seven 'Carabao' mango varieties were inoculated with causal pathogen of stem-end rot disease and assessed based on its degree of infection. Percent susceptibility of the evaluated varieties ranges from 85% to 100%. It was observed that 'Carabao' mango varieties were susceptible to stem end rot disease. On the other hand, isolation and inoculation of causal pathogen of scab disease, and evaluation of mango varieties for resistance to scab disease is still on the process of optimization. Development and design of molecular markers was done as another option to detect *Elsinoe mangiferae* (causal pathogen of scab disease) in leaf samples. Two molecular markers (forward and reverse) were designed and developed through multiple alignment analysis using DNA sequences of *Elsinoe mangiferae* available on published literatures. These markers were validated using subcultures of suspected *Elsinoe mangiferae* isolated from leaf samples affected by scab disease. In addition, in situ inoculation was done as an alternative option for evaluation of resistance against scab disease. Twenty-one 'Carabao' mango varieties were grafted for the in situ evaluation of resistance against scab disease. Natural observation of scab disease on 'Carabao' mango varieties was also done as another approach for evaluation of resistance against scab disease. Twenty one 'Carabao' mango varieties were evaluated for its resistance against scab

disease. Results revealed that 'Carabao' mango varieties were susceptible to scab disease. DNAs of 69 'Carabao' mango accessions were extracted, purified and quantified for GBS library construction and bioinformatics analysis.

Keywords: 'Carabao' mango, stem-end rot, scab, Genotyping-by-sequencing (GBS), Genome Wide Association Studies (GWAS).

10:00 – 10:20

S108- Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS Genom-wide Association Studies (GWAS)

Edward A. Barlaan, Mary Grace S. Balbuena, Michael James L. Abrea and Evelyn F. Alejandro

ABSTRACT. Mango (Mangifera indica) is one of the economically important fruit crops for local consumption and export. However, mango production in the Philippines is constrained by postharvest diseases affecting fruit quality and yield. These diseases include stem-end rot (SER) and scab caused by *Lasiodiplodia theobromae* and *Elsinoë mangiferae*. There is a need to identify sources of resistance to these pathogens from various mango strains, cultivars and varieties to improve the Philippine Carabao mango for resistance to SER and mango scab. The study aims to isolate and molecularly identify the causal pathogens and develop molecular markers associated with scab and SER resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utility in marker-assisted selection/breeding. Non-carabao varieties and strains were used as potential source of resistance to SER since the carabao mango are mostly susceptible to SER. Various mango trees were tagged and characterized thirty-two derived from BPI-Giumaras, twenty six (26) from Region XI and 34 from Region XII. Fifty two (52) non-carabao mango fruits derived from Guimaras and Regions X, XI and XII were inoculated in vivo with stem-end rot. Results showed that 30 varieties were highly susceptible, 4 susceptible, 6 moderately susceptible, 6 moderately resistant and 6 resistant to SER. Scions from same trees including other mango strains and varieties were grafted for in situ inoculation of mango scab. Typical symptoms of scab were isolated for morphological characterization, pathogenicity test and molecular identification. A total of nineteen prospective scab isolates were sent for DNA sequencing. Disease reaction and molecular assays for mango accessions are still in progress.

Keywords: Mango, Stem-end rot, scab, Genotyping-by-sequencing (GBS), Genome Wide Association Studies (GWAS).

10:20 – 10:40

S111-Selection for Glyphosate Tolerance and Corn Borer Resistance in Corn Segrating Populations

Jessie G. Elarde and Edward A. Barlaan

ABSTRACT. Corn is an economically important crop consumed as human food and animal feed. There is a need to increase production due to strong demand for food security and feed supply in the country. However, corn production is constrained by biotic factors such weeds and pests affecting productivity and quality. Current approaches in addressing these constraints in corn production involve planting of varieties with herbicide resistance or tolerance to pests. Hybrid populations with glyphosate resistance and/or resistance to corn borer were used as base populations for selection of tolerance and resistance in selfed families or progenies. This study aimed to identify corn borer resistant and glyphosate tolerant inbreed lines with the ultimate goal of developing high yielding open-pollinated varieties and hybrids. As source of corn borer infestation, the experimental area was planted with susceptible corn borer spreader rows 45 days ahead of the S3 families of populations 2101S3, 2103S3, 2105S3 and 2107S3 for evaluation and selection of corn borer resistance. The same entries along population 2109S3 were applied with glyphosate herbicide 15 and 35 days after planting for selection of herbicide resistance. Results showed that 98.5% of inbreeds expressed no indication of corn borer feeding. Likewise, there were no plant mortalities observed in all 3,779 corn inbreeds sprayed with glyphosate herbicide. Results suggests fixation of genes for herbicide resistance and tolerance to corn borer occur in selected families. Based on good agronomic traits, a total of 1,449 plants from five populations were selected for S4 family evaluation.

Keywords: Weed control, corn borer resistance, self-pollination, glyphosate herbicide tolerance.

10:40 – 11:00

S130- Development of Innovative approaches for clonal propagation of industrial and fruit crops

Sheena B. Lucena, Ferdinand A. Duldulao and Edward A. Barlaan

ABSTRACT. There is a strong demand of propagated seedlings for industrial and fruit crops. There is a need to develop different innovation approaches to enhance the production of quality planting materials. The study aims to develop propagation techniques utilizing plant growth hormones; to evaluate different potting materials to improve rooting system; and to utilize the best concentration of hormone and potting materials in propagating five crops. Different hormone concentrations were used such as (12.5mg/L, 25mg/L and 50 mg/L.- IBA) and (20+12.5mg/L, 40+25mg/L and 80+50mg/L - BA+IBA). Potting materials were used for the assessment of different root parameters (V-shape root trainer cup, bottom plastic bottle, top plastic bottle, net bag and polyethylene bag). Cacao obtained the highest percentage survival of 87.50 in hormone concentration of 25 mg/L IBA which was significantly differed compared to control. Lanzones had positive response in terms of scion shoot length with 11.90 which was

observed in hormone 25 mg/L-IBA. Pummelo also gave the longest scion shoot length of 19.30 applied in hormone 40 mg/L+25 mg/L and obtained the most number of leaves with 22.17 at hormone concentration of 20 mg/L + 12.5 mg/L-BA+IBA. Durian had no significant difference observed in all treatment means. No significant effect between hormone and crop interaction in relative difference between scion union and the rootstock. Meanwhile, biggest stem diameter and plant height of all crops were obtained in polybag. Longest root length in durian was observed in top plastic bottle and V-shape root trainer. Root length in rubber was significantly longer in all potting materials except the top plastic bottle. Durian and rubber had the heaviest fresh biomass weight regardless of potting material. Highest number of leaves was noted in durian. Graftability and buddability were obtained in durian and rubber which attained the standard diameter and height in all potting materials. Grafting of cacao, durian, lanzones, pummelo and budding in rubber have been done in selected hormone and potting materials

Keywords: Cacao, rubber, durian, lanzones, pummelo, hormone, potting material

11:00 – 11:20

S121-Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables

Purificacion O. Cahatian, Maria Irinea S. Candolita and Naomi G. Tangonan

11:20 – 11:40

S123-Collection, Evaluation and Maintenance of Cut Foliage and Flowering Pot Ornamentals at USMARC Center

Nancy E. Duque and Lorelyn Joy N. Turnos

ABSTRACT. This project was conceptualized to establish and maintain a collection of cut foliage and flowering pot ornamentals at the University of Southern Mindanao Agricultural Research and Development Center (USMARDC). Specifically, it aims to collect different accessions or varieties of cut foliage and flowering pot ornamentals, evaluate the collected ornamentals, and maintain and conserve the ornamental collection. Foliage ornamentals collected from various sources consisted of the following; 50 accessions of coleus, 26 aglaonema, 10 crotons, 4 for cordylines, 3 papua, 11 dracaena, 9 diffenbachia, 12 philodendron, 3 syngonium and 8 calathea. On the other hand, the flowering pot ornamentals collected are as follows: 8 accessions of hibiscus, 24 bougainvillea, and 10 begonias. Bed flowering ornamentals such as portulaca (5), zinnia (6), cosmos (3) and celosia (3) were also planted. Preliminary evaluation of the different accessions showed morphological variation in quantitative traits such as leaf length, leaf width and petiole length. Large variability was also noted in qualitative characters like leaf shape, leaf margin, leaf base and leaf apices.

Keywords: collection, accessions, ornamental, maintenance

1:00 – 1:20

S126- USM-Treelife Biotechnology Development program: Isolation and molecular Characterization of potential plant growth promoting Microorganisms from Coconut Industry Waste

Maria Elena N. Tanabe, Cromwel M. Jumao-as and Jerry John M. Taray

ABSTRACT. The utilization of microorganisms to promote growth and increase crop production has begun to be studied. Microorganisms isolated from varying sources of organic matter differ. This project aims to produce an effective bioinoculant for agriculture and other related industries by utilizing microorganisms present in coconut industry wastes. Initially, this project started with identifying microorganisms to examine their potential biotechnological applications such as biofertilizer and/or biocontrol agents. Isolated bacteria and fungi were molecularly characterized and identified using 16S rDNA gene and ITS gene, respectively. There were 24 bacterial isolates and 10 were identified to have potential growth promoting properties based on literature review. There were 14 fungal isolates and 1 was identified to have potential growth promoting properties while the other 3 were identified to have other biotechnological uses based on literature review. The potential microbial isolates will further be studied to (1) validate their plant growth promoting activities and other biotechnological uses, (2) develop effective bioformulations, and (3) assess their efficiency in the greenhouse and field tests eventually producing of effective bioinoculants for agriculture and other related industries application.

Keywords: Biotechnology, Microbial Inoculant, Biofertilizer, 16s rDNA, Industrial Waste

1:20 – 1:40

S128- Productivity of Crossbred Sheep and Goats Fed Brachiaria Hybrid CB. Mulato II (*Brachiaria ruziziensis* X *B. brizantha* X *B. decumbens*) Fertilized with Varying Levels of Nitrogen

Josephine R. Migalbin, Roy C. Ricabar, Julius Jerome G. Ele, Geoffray R. Atok, Jurhamid C. Imlan

ABSTRACT. Small ruminants form an important economic and ecological niche in small farm systems and agriculture. Their current low level of contribution is dismal, and is not commensurate with the potential capacity for higher levels of production, thus, it is imperative that their productivity should be improved. Nutrition plays an important role in increased productivity of livestock and the need for quality forage and concentrate should be an integral component of their feed. Mulato II is a Brachiaria hybrid with potential of improving livestock productivity. Since it is a grass, its nitrogen requirement should be met. Four nitrogen levels (0, 75, 150, 225 kh N/ha) was studied to determine their effects on plant height, number of tillers and herbage yield on Mulato II. NO significant difference was observed in plant height but the optimum level of nitrogen at 150 kg N/ha significantly increased number of tillers and herbage yield of Mulato II. Data on the productive performance of goat and sheep and their carcass characteristics are not yet available as these components are still ongoing.

Keywords: Brachiaria hybrid, Mulato II, herbage yield, number of tillers, small ruminant

1:40 – 2:00

S115-Etiological Studies and Management Strategies against Major Diseases of Dragon Fruit

Jasmin A. Pecho, Ardniel A. Baladjay and Samsudin S. Panday

ABSTRACT. The research on "Etiological Studies and Integrated Disease Management of Major Diseases of Dragon Fruit" aims to a) assess the extent of damage of major diseases of dragon fruit in North Cotabato, b) identify the morphological and cultural characteristics of the suspected pathogens that causes the dragon fruit diseases, c) formulate the biological control, fermented teas and strategies against the suspected pathogens of dragon fruit that causes diseases, and d) develop IEC materials on diseases of dragon fruit. Actual field surveys were conducted to different areas in North Cotabato with dragon fruit production. To facilitate the data gathering, a coordination meeting was done with the Office of the Provincial Agriculturist and the concerned Local Government Units in Cotabato Province. The following dragon farms were visited: 1) USM-CA-SDC, USM, Kabacan, 2) Marbel and Boragay, Kidapawan City, and 3) Tigbawan and Kimarayag, Pigcawayan, North Cotabato. The field survey results revealed that a seven (7) year old dragon fruit farm was established in Brgy. Marbel, Kidapawan City with more than 1,500 posts in 1.8 hectares. Canker was the most common disease found in three visited municipalities. In etiological study, canker is caused by the *fungus Neocytalidium dimidiatum*. A bioassay was conducted and found out that Biocon1 and Biocon2 were significantly comparable to chemical3 (chemical check). Further, a nursery trial was conducted. Initial result showed that chemical1, chemical2, biocon1, and biocon2 were comparable to chemical3 (chemical check). The collection of field data is still ongoing.

Keywords: dragon fruit, biological control, canker, *Neoscytalidium dimidiatum*

2:00 – 2:20

S132- Validation of Molecular Markers for Identification of Cacao HYVs, Criollo Types and Disease Resistant Varieties Through Marker-assisted Breeding

Edward A. Barlaan, Amy E. Elivazo and Allen Jay E. Austria

ABSTRACT. Molecular markers were generated from the completed DOST-PCAARRD funded project to identify National Seed Industry Council (NSIC) recommended cacao varieties, true Criollo types, and cacao accessions with resistance to cacao vascular streak and phytophthora diseases. There is a need to validate these markers for utility in the identification of authentic cacao varieties and Criollos and marker-assisted selection/breeding. The study aimed to validate SSR markers to identify NSIC recommended cacao varieties in commercial nurseries; to assess the claimed Criollo cacao types in the Philippines for identification of authentic or true-to-type Criollos, and to validate the SSR markers for identification of cacao breeding materials with resistance to vascular streak and phytophthora diseases. The Bureau of Plant Industry and accredited cacao

nurseries in Region XI were communicated for collaboration. Samples were randomly collected with 5-10 plants per variety. Leaf samples were used for DNA extraction, PCR amplification and fingerprint analysis. A total of 21 UF18 and 17 BR25 seedlings collected from Region XI were validated. SSR marker C7729t1 was able to confirm authentic UF18 and C8223t1 for BR25 yielding allele in 4250bp and 600bp, respectively. Thirty SSR markers were used to screen claimed criollo collected from different regions. Initially, 96 claimed criollo were screened using the SSR markers. Twenty-one cacao accessions from University of Southern Mindanao genebank were collected, extracted and screened for marker-aided assisted screening for diseases. SSR markers C10238t1 and C1618t2 were used for screening Phytophtora palmivora; and C4101t2, CDRAat11 P3T7 C74, and C1223t3 for Lasiodiplodia theobroame.

***Keywords**:* Cacao, SSR markers, Criollo, NSIC, vascular streak disease, phytophthora

10:00 – 10:20

S201- Enhancing RD&E indexing system (RDEIS) of USM: Design, development and evaluation

Melecio A. Cordero Jr., Ryan Z. Gonzaga and Eugene G. Ranjo

ABSTRACT. In USM, the Research and Development Office (RDO) has outlined in its strategic plan in knowledge management (KM) to create, share, use and manage the knowledge and information of an office. To keep a reliable record of the research information in the university, the office has adopted an indexing system for the undergraduate theses. This study is aimed to review and enhance the existing indexing system to include the graduate theses and dissertations. This enhanced indexing system also captures the funded research and extension projects in the university. The system will also be evaluated for its functionality and usability.

***Keywords**:* indexing, thesis, research, project, record

10:20 – 10:40

S202- Digitalization of USM Faculty Workload

Hazel Ann S. Soriano, Ryan Z. Gonzaga and Arjay S. Agbuang

ABSTRACT. Digital technology alleviates the life of teachers when incorporated to education; it helps keep the work organized, convenient, and efficient. Digitalization of faculty workload will help speed up the process of preparation and review. The faculty loading is a challenging task every department chair face every semester and reviewing these workloads is a very meticulous task done by the Academic Compliance and Monitoring Head. This study was conducted to develop a digital system for USM faculty loading. Specifically, this study aimed to gather the needed information for the development of data base system for faculty loading; develop a digital system for summary of faculty workload and individual time and location; and evaluate the performance of the developed digitalized software for faculty loading. The first

step of the study was to review the process of faculty loading and its perennial problems or bottlenecks. A master list of faculty per department with details such as highest degree attainment, rank, designation, load displacement, number of preparation, actual and total load, normal load, over or underload units was created. The database schema of the Faculty Workload System was developed using the gathered data in the first quarter. The developed faculty loading software was designed based on how it can generate the faculty individual time and location. It represents the logical configuration of all part of the relational database of the system. Additionally, the source code of the Login page of the system was made. Moreover, the source code and the output of the Workload page was crafted. The developers enhanced the entire system by writing code using the PHP programming language. The digitalized software was initially tested for usability, errors and bugs. Based on the initial testing, the developers improved and enhanced the software. The instrument was also validated by experts to ensure that it will measure the performance of the software. A demonstration on how to use the software was conducted. The developed software was then evaluated by nineteen (19) by target end-users- the department chairs and Director for Instruction Staff of the University of Southern Mindanao including external campuses using 20 items survey questionnaire. Each item is measured on the scale from 1 (strongly disagree) to 4 (strongly agree). There were four (4) factors under this instrument, namely, functionality, reliability, usability, and portability. The survey questionnaire aimed to determine the level of performance of the software. Based on the result of the evaluation, of the four (4) factors, usability had the highest mean (3.52) followed by functionality (3.45) and Portability (3.32) with the description very high respectively. However, reliability got a mean of 3.13 with the description high. This means that the software Faculty Workload System is usable, functional, portable, and reliable. The overall mean of 3.36 indicates that the developed software excellently meets the standards and is fit for use.

Keywords: Digitalization, Development, Software, Faculty Workload, USM

10:40 – 11:00

S204- Design and Development of USMCEE online Registration

Arjay S. Agbunag, Clarence Dave C. Galas and Alvin C. Mibalo

ABSTRACT. Registration is a method of recording a name or information on an official list. This is a process of submission of related information as requirement to be officially enlisted. In USM, an applicant can be accepted to enroll in college after he/she has taken and passed the entrance examination. The schedule of entrance examination and the number of applicants are limited and monitored. As a result, USMCEE Online Registration has been developed to address problems on USMCEE. The study sought to provide an online facility on online registration for USMCEE applicants. Specifically the study sought to develop an online portal on USMCEE online registration, to deploy the system in a working environment and to develop a user manual. The study uses the agile development methodology for the development of the system. This methodology include phases like planning, designing, coding and testing of the researcher conducted brainstorming with some group of people for the development of the system. The online USMCEE registration system includes the registration process and selecting of schedule of USMCEE applicants. The system also helped the UTDC and ARO personnel to

manage the information of the applicants. User guide was also include in the development of the system.

Keywords: online registration, entrance test, online portal, entrance examination, automation

11:00 – 11:20

S207- Maguindanaon Food Products and Delicacies: Standardization and Promotion for Commecialization

Roy B. Gacus, Francisco Gil N. Garcia, Esmaira G. Gunsayan, Geraldine M. Quiñonero, Merlyn A. Musali and Leonora M. Silvano

ABSTRACT. The main purpose of this project is to promote Maguindanaon food products and delicacies by developing IEC materials and recipe book for public knowledge, awareness, and understanding. As well as, to standardize the food by getting the most frequent measurements of raw materials, ingredients, utensils/equipment, and procedure used by the producers. This project identified the sources of Maguindanaon food products and delicacies through field interviews from the referrals, and desk's review of secondary information taken from the internet. Relevant information like customary preparation, raw materials, ingredients, cooking utensils and equipment were provided by the local producers in developing food products and delicacies, as well as the standardization. Results revealed that there are twelve (12) sources (local producers or owners) were identified and located at Maguindanao, Cotabato and Sultan Kudarat Provinces. These sources produced twelve (12) Maguindanaon food products and delicacies. About eight (8) products/delicacies were subject to standardization based on the modal value and evaluation from the food expert namely: kagikit, pastil/patil, tinapayan, chicken linigil, panyalam/panialam, tinadtag, kumukunsi, and patulakan. Enterprise budget for kagikit, pastil, panyalam/panialam, tinadtag and patulakan were provided and showed a promising profit.

Keywords: Enterprise budget, Maguindanaon food products and delicacies, promotion, and standardization

1:00 – 1:20

S210- Commercialization of Chayote Products

Jenny B. Mamacus, Emilie S. Estelloso, Janice E. Reynes, Jo-Ann D. Santos and April Geraldine M. Quiñonero

ABSTRACT. Chayote (Sayote) products: Leaf Tea, Jam, Sauce/Ketchup and Pickle Relish was the focus of this study. It aimed to develop and standardize the formulations and processing methods, determine its product quality through objective and subjective evaluation, determine the appropriate packaging materials and label, determine the degree of consumer preference, determine the consumer's emotion/acceptability, and evaluate the profitability and return on investment (ROI) of the products. Series of trial and error were conducted to achieve the standardized formulations and processes of the products. For the objective

evaluation, the result revealed that all standardized formulations and processing methods reached or passed the required standards for proximate and physicochemical properties of the Chayote (Sayote) Jam, Sauce/Ketchup and Pickle Relish. Similarly, the Chayote Leaf Tea's standardized formulations and processing methods reached or passed the required standards for phytochemical properties. For microbial evaluation, the result revealed that microorganisms are lesser or not detected in a glass/bottle container for the Jam and Pickle Relish, Zip Lock for Sauce/Ketchup and tea bag for Leaf Tea. Subjective evaluation of the product was done through organoleptic evaluation with fifteen (15) respondents in 3 replications. The gathered data were analyzed and interpreted through inferential statistics. The result then revealed that Chayote Jam is best in Pectin formulation, Chayote Pickle Relish is best in quick pack process or unfermented method, Chayote Sauce/Ketchup is best in sour formulation, and Chayote Leaf Tea is best in Black Tea process. Although, the result also revealed that qualities evaluated for Chayote Jam, Ketchup/Sauce, and Leaf Tea have no significant difference among the treatments. Dissimilarly, in the Chayote Pickle – Relish, it was revealed that there is a significant difference among the treatments thus null hypothesis was rejected. Consequently, the Chayote Jam packed in glass container with the pectin formulation, Chayote Pickle Relish packed in glass container with the fresh formulation, Chayote Sauce/Ketchup packed in zip lock pouch with sour formulation, and Chayote Leaf Tea in tea bag with black tea process will be subjected for appropriate labeling, consumer preference test, consumer's emotion/acceptability test and computation of profitability and return on investment (ROI).

Keywords: Chayote Products, Chemical Analysis, Organoleptic, Consumer Preference, Marketability

1:20 – 1:40

S211- Standardization Protocol for the Development of USM Food Products

Harem R. Roca, Frederick John B. Navarro, Bryan Lloyd P. Bretaña and Marlon L. Manansala

ABSTRACT. The project was conducted to assess the various protocols /procedures developed by the HVCFPC; compare and evaluate the existing recipes adopted for every selected product with the improved/ new version; develop a standardized processing protocol for processed products; upgrade equipment, laboratory operation; and improve product packaging. For turmeric, upgrading of personnel protective equipment (PPE), laboratory operation, machine equipment, and packaging was carried out and were put in place. Cacao post-harvest handling methods, tablea preparation, processing equipment and packaging were enhanced. Likewise, ice cream was formulated using marang fruit as natural flavor in conjunction with other ingredients. Optimization of the most acceptable rate of marang was explored. Initial results through sensory evaluation were promising. Cacao wine study was set-up but due to Pandemic, some interventions in the process were omitted resulting in low quality wine. However, a new set-up was conducted and observation is on-going.

Keywords: cacao wine, ice cream, equipment, laboratory, marang, packaging, post-harvest, product, protocols , tablea, upgrade

1:40 – 2:00

S212- Evaluation of Microbial, Physical, and Chemical Properties of USM High-Value Crops Processing Center Food Products for Quality Control Measures

Bryan Lloyd P. Bretańa, Frederick John B. Navarro, and Harem Roca

ABSTRACT. Food safety is of global importance for the prevention of foodborne illnesses. Food safety is instrumental in promoting public health and marketing of safer food products. The University of Southern Mindanao High Value Crops Food Processing Center (HVCFPC) had developed several food products, however, standardization of production protocols and assessment of overall microbial, physico-chemical, and sensory quality of these food products are essential to ensure general acceptability and overall safety. This study aimed to determine the microbial quality and physicochemical properties of the food products developed by USM HVCFPC. This was done by detecting indicator organisms and evaluating the products' physico-chemical properties. Results revealed that turmeric tea passed the microbial quality standards set by Food and Drugs Authority. Different tablea produced via several bean handling techniques and developed natural-flavored vinegar had passed most of the parameters required. No pathogenic microorganisms such as coliform and Salmonella were detected. Expectedly, high yeasts and molds count was observed in vinegar treatments especially at the earlier stage of fermentation process. Measured physico-chemical parameters of the vinegar products were within the standard and high polyphenol content was observed at later fermentation stage which might indicate potential antioxidant property. Generally, USM HVCFPC products were acceptable, but protocols need to be optimized to ensure overall quality and safety.

Keywords: food safety, microbial quality, turmeric tea, tablea, vinegar

2:00 – 2:20

S213- Optimization of Natural Flavored Vinegar and Commercialization of USM Products from High Value Crops

Frederick John B. Navarro, Bryan Lloyd P. Bretana, and Harem R. Roca

ABSTRACT. The natural flavored vinegar production was investigated using different experimental setups to optimize the procedures for the following process: substrate selection, fermentation acceleration, and preservation. The quality of the vinegar was monitored through pH, Brix, acidity, and total phenolic content (TPC) with the analytical techniques such as potentiometry, refractometry, titrimetry, and spectrophotometry, respectively. Rice (R) with turmeric (T) or insulin (I) plant extracts can be used as a substrate for vinegar production. The fermentation process of rice and plant substrate can be accelerated through using starter C (alcohol fermentation pathway) as initiator and starter B (acetic acid fermentation pathway) as a booster. Other combinations of starters with effective acetic acid fermentation were CB> CA=AB>AA. Starter C can extract the polyphenols in the plants thus increasing the total phenolic content of the vinegar with a potential synergist to phenolic contents of starter B. Pasteurization and clarification process affects the vinegar quality and the reduction of the product volume. Heating the vinegar tends to preconcentrate the

solution thus increasing the acidity of the product. Clarifying agent neutralized the acidity thus increasing the pH of the vinegar. Vinegar were produced with treatments: R:CB (pH=2.51, acid=2.43%, TPC= 395.18mg/L GA); RI:CB (pH=2.51, acid=3.39%, TPC=674.44mg/L GA); and RT:CB (pH=2.55, acid=2.49%, TPC=618.31mg/L GA). The existing labels of HVC products have limited information in reference to DOH AO 30 s 2014. These products have a large potential for e-commerce in consideration of the cost, packaging, and labeling. More respondents are required to establish predictive values for the personality traits and motives of customers in emerging food and flavors.

Keywords: Fermentation, Turmeric, Insulin, Polyphenol, Label

2:20 – 2:40

S214- Market Potential and Product Acceptability of UF18 Cacao Variety

Cheryl Y. Dulay, Ivy Mar B. Cabornida and Jigzcel Divine F. Basoy

ABSTRACT. To keep the pace with the surge in cacao on both local and global demand, Philippines increased its production by providing funds for the Philippine cacao industry. Most of the cacao planting materials distributed were UF18 cacao varieties. Although UF18 has the highest yield per tree per gram and has the highest bean size compared to other varieties, many local chocolate producers are hesitant to buy due to its unfavorable taste for chocolate production. The study determined its market potential and product usability for cacao mass production which is the main ingredient for chocolate. It benchmarked the existing protocols practiced by the large and small-scale processors in making cacao mass for sikwate. After harvesting, most store the pods for 1-3 days before breaking and getting the beans. Draining for 12- 48 hours is done before beans are subjected to fermentation which ranged from 3 – 7 days; some used thermometers to monitor the heat during fermentation while others used personal instincts based on their experiences. For large scale processors, doneness of fermentation is determined using cut test, while small scale processors used their sense of smell. Almost all practiced sun drying. The fermentation techniques made use of wooden cone, wooden box, plastic sack, “bukag”, styro foam/ice chest and plastic bag. Analysis on sensory qualities of sikwate revealed significant differences in appearance, consistency, flavor and overall acceptability at 5% level of significance and significant difference in odor at 1% level of significance. Sikwate from undrained-fermented cacao beans have higher rating on appearance, consistency, flavor and overall acceptability ratings than those from drained-fermented UF18 cacao beans. The UF 18 cacao mass, chocolates of all variants, vinegar, wine, cacao butter, briquettes and by-products are widely available both in local and global market.

Keywords: Cacao, market potential, UF18 cacao variety

2:40 – 3:00

S205- Development of Low-Cost Tilling Machine for Optimum Vegetable Gardening

Joel V. Misanes and Ma. Dely P. Esberto

ABSTRACT. The project intended to develop a low-cost tilling machine for soil cultivation useful for backyard vegetable gardening. Specifically, it aims to design a tilling machine, construct the machinery, test the workability, and revise the parts for better tilling performance. The development of tilling machine was the conceptual response of the researchers to create a technological and innovative resources in aid of machine invention which are useful to the end-users, academe, small medium enterprise, and entrepreneurs much more with the farmers engaged in vegetable gardening. It is also aligned to the Philippine Medium-term Development Goals that seeks to promote science and technology and creative arts to enhance innovation and creative capacity towards sustaining, inclusive development. The project development covered the design and fabrication of the tilling machine. The preparation of the shop drawings included the pictorial, exploded, orthographic and detailed drawings. These were used as guides in constructing the machine which covered the preparation of materials, body building, machining, assembling, installation of the engine and the finishing touches of the final fabrication. The tilling machine was designed based on the standard specifications which was done from January to March 2021, while the construction of the machine started on April 2021 and completed in June 2021. The body frame assembly is consisted of the main frame, mounting rail, top plate, handle, and wheel bracket and wheel. The body frame is made of a 38 mm angle iron cut to sizes and welded for permanent fastening. Field testing of the tiller machine showed a field efficiency of 72.45% on a 120 sq.m. unopened area covered with long tiger grasses.

***Keywords**:* tilling machine, farm implements, field efficiency, vegetable gardening, soil cultivator

3:00 – 3:20

S234-Molecular Detection and Identification of Microbial Pathogens of Banana

Edward A. Barlaan, Michael James L. Abrea and Evelyn F. Alejandro

ABSTRACT. Banana production in the Philippines is affected by different diseases causing significant reduction in productivity. Major losses have been attributed to Panama disease caused by *Fusarium oxysporum f sp. cubense*, Black sigatoka by *Mycosphaerella fijiensis*, Moko or bacterial wilt by *Ralstonia solanacearum* and bunchy top caused by Banana bunchy top virus. There is a need to develop molecular detection technology that can quickly, safely and reliably identify and detect in real-time the causal pathogens in banana and soil before disease expression and outbreak. The study aims to isolate and molecularly identify the causal pathogens, verify pathogenicity of the isolates and develop primers and probes for detection in real-time quantitative PCR (qPCR) and digital PCR. Diseased plant samples were collected from different regions in Mindanao for the isolation and purification of pathogens. Purified isolates were PCR-amplified for DNA sequencing targeting the ITS gene for *Fusarium oxysporum f.sp*. *cubense* and *M. fijiensis*, 16s rRNA gene for *R. solanacearum* and coat protein

gene for banana bunchy top virus. Identities of the isolates were confirmed through BLAST analysis. These isolates were used for pathogenicity tests in banana healthy seedlings, which expressed the diseases after inoculation. Primers and probes for each pathogen were designed from the confirmed sequences for real-time qPCR and digital PCR analysis. All microbial pathogens were successfully identified and detected in qPCR except *M. fijiensis*, which needs further modifications in primers and probe. The qPCR assay is very sensitive while probes are effective in detecting the pathogens even at femtogram DNA level. Digital PCR effectively detected the loads of these pathogens in infected samples and even in phenotypically healthy plants yet infected based on molecular assay. This study is the first report so far in the world on the digital PCR detection of causal pathogens of major diseases in banana. These new detection technologies will boost the banana industry through rapid and accurate detection of pathogens for disease monitoring to provide preventive or control measures leading to increase productivity and profitability.

Keywords: Bunchy top, digital PCR, Moko, Panama disease, qPCR, sigatoka

3:20 – 3:40

S230- Development of Data Hub for Smart Agriculture Technologies

Melecio A. Cordero, Jr., Jerry T. Piamonte and Clark Kneil L. Caoile

ABSTRACT. The study, Development of Data Hub for Smart Agriculture, was conducted and tested at the College of Engineering and Information Technology and Organic Building, on January to June 2021. The general objective of this study was to establish a data hub for smart agriculture technologies. Specifically, it aimed to: (1) implement a local area network with database and server for processing and storing of real-time data; implement a wireless connectivity in the experimental fields; and develop an automated application for monitoring and dissemination of information. In the development of the project, the researchers used different software applications such as WordPress for the website creation, Cisco Packet Tracer for the design and routing of the data hub and Arduino IDE for the coding of the microcontrollers for the field sensors. For data gathering, data collected from the other components were inserted and uploaded to the website and data collected from the sensors were stored at the data hub for easier access.

Keywords: database, local area network, website, arduino, sensor12

3:40 – 4:00

S233- Upgrading of Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKARGEN

Francisco Gil N. Garcia, Adeflor G. Garcia, Purificacion O. Cahatian and Dennis F. Sarmiento

ABSTRACT. The upgrading of the geographic information technologies for high value commodities and indigenous crops in SOCCSKSARGEN included two component projects. The

first component project was the "Establishment of the Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKSARGEN funded by the Department of Agriculture - Bureau of Agriculture Research thru the Institutional Development Grant with 8M budget. The second component project was the "Upgrading of Geographic Information System at the University of Southern Mindanao" with 5 M fund allocation thru the Agricultural enhancement Fund of the Department of Agriculture (ACEF). The establishment of the "Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKSARGEN "is envisioned to house the geographic soils information center, soils and insect museum and the smart and digital agriculture hub which will lead in the multifaceted activities with emphasis on precision agriculture. It is designed to be the learning hub/center of soil and climate change adaptation in research and extension activities responding to one of the strategic framework of the PDP 2017-2022 to wit: "expanding economic opportunities in agriculture, forestry and fisheries". The first floor will house the Geographic Soils Information Center and the Soils and Insect Museum. The smart and digital agriculture center will be on the second floor. The equipment and facilities acquired are installed in the Geographic Information Support System for high value and indigenous crops in SOCCSKSARGEN. This will be the anchor facility for the scaling up of the smart and digital technologies of all high value crops and indigenous commodities' stakeholders (agricultural extension workers, graduate students, and researchers).

Keywords:

8:20 – 8:40

S222- Upgrading of Crop Processing Center at University of Southern Mindanao

Francisco Gil N. Garcia and Harem R. Roca

ABSTRACT. The project is aimed to upgrade the USM Processing Center through the acquisition of new pieces of equipment to be used in the processing of additional products with a budget of Php 5 million and DA-BAR as funding agency. Following government protocol, a series of bidding was conducted, and a winning bidder was elected via Single Calculated and Responsive Bid (SCRB). All other requirements thereafter were issued by USM BAC to the winning bidder and in turn, the latter complied with all post-bidding requirements. Delivery of the various equipment is expected within the next 45 days from the date of contract signing.

***Keywords**:* upgrade, processing, equipment, bidding, SCRB

8:40 – 9:00

S221- Development of Handbook on Good Agricultural and Marketing Practices for Economically Important Crops in USM

Edward A. Barlaan, Marry Grace S. Balbuena, Jeannie U. Duka, Victor C. Dapon, Helen A. Macailing and Nicko Abestano

ABSTRACT. Industrial crops such as rubber and oil palm and food crops like cacao, durian, lanzones and mangosteen are agricultural crops with economic values. Although these commodities are the banner crops of University of Southern Mindanao, there are very limited updated printed materials that provide comprehensive information from pre-planting to good agricultural practices and marketing systems. The study aims to consolidate the different established good agricultural practices and marketing practices on high value crops, to develop drafts and subject the crafted drafts for assessment through experts and specialist of respective crops and to generate prototype copy for reproduction. A total of 6 handbooks on "Good agricultural and marketing practices" (GAMPs) was crafted. These handbooks were crafted to address the needs of small and medium sized orchard practitioners or farmers, as well as the students, researchers and other stakeholders. The handbooks contain the features of the different varieties of each crop, production practices and techniques which includes the agronomic and biological background of the crop, production (planting, water management, and fertilization), pest and its control, diseases and its control, harvesting and post-harvest management as well as the marketing practices, including the cost and return analysis of each crop. Final drafts, lay-out and validation was conducted and a prototype copy of the handbook was drafted.

Keywords: Good agricultural practices, handbook, high value crops, marketing practices

9:00 – 9:20

S209- Upgrading of High Value Crops Food Processing Laboratory at University of Southern Mindanao

Sandra Joy P. Pahm and Harem R. Roca

ABSTRACT. The High Value Crops Food Processing Center based at University of Southern Mindanao was established in 2012 with funds from the Department of Agriculture-Bureau of Agriculture Research (DA-BAR). It has become the processing center mainly for high quality turmeric tea and its variants and the production of the USM 'tableya' which are produced from home-grown cacao trees. The cacao trees were the result of various research and collaboration in the university with more than 100 varieties and accession of cacao are now being grown productively. Availability of efficient postharvest facilities are necessary for the development of the important characteristics and quality fine flavor beans. With the increasing supply of cacao beans for processing, it prompts the need to upgrade the Center which will be involved on improving and optimizing cacao postharvest operations such as fermentation, drying and roasting in response to the needs of the cacao farmers for appropriate technologies that are efficient, accessible and, affordable. Likewise, it is also important to acquire state-of-the-art equipment to be used in developing high quality chocolate products that are affordable to the ordinary Filipino consumer.

Keywords: cacao, tableya, postharvest, processing, upgrading

9:20 – 9:40

S223- Upgrading of Tissue Cultures Facility in University of Southern Mindanao

Mark Al-Jamie J. Muttulani, Harem R. Roca and Sheena B. Lucena

ABSTRACT. Tissue culture is an important technology for the production of disease-free and high-quality planting materials for rapid production of many uniform plants. This technology has been used in mass production of planting materials for various economically important crops. This has been instrumental in supplying tissue cultured banana planting materials in various banana growing areas in the Philippines. University of Southern Mindanao (USM) has tissue culture facility that becomes instrumental in training students, researchers and private enterprises engaged in tissue culture in banana and other crops. In addition, plant tissue culture is used widely in plant science and also has a number of applications. USM has generated molecular markers that can be used for certification of pure or genuine planting materials for ensuring high production due to the use of correct high yielding varieties. However, the current facilities for tissue culture and biotechnology in USM are already antiquated and inadequate to house many new equipment. These facilities are located in one building to supplement and complement researches activities related to tissue culture and molecular researches. Besides, the current set up cannot accommodate students, researchers, and other stakeholders for training, skill development, workshop and instruction. Thus, there is a n urgent need to upgrade the facilities particular on tissue culture laboratory with several functions, these includes production of quality true-type and disease free banana seedlings, research and training center for DA-BAR funded biotechnology and molecular technology related researches for researchers and technical staff of different state universities and agencies of Department of Agriculture from various regions and other stakeholders.

Keywords: laboratory, tissue culture, quality planting materials, upgrading

9:40 – 10:00

S224- Upgrading of Cacao Post-Harvest Processing Center at University of Southern Mindanao

Harem R. Roca and Sheena B. Lucena

ABSTRACT. A project was conducted mainly to upgrade the Cacao Post-harvest Processing Center at the University of Southern Mindanao through rehabilitation of cacao post- harvest processing equipment and facilities in support of on-going and future cacao research activities. It is funded by DOST-IDD with an appropriation of Php 5,000,000.00. So far, all necessary equipment requested were already bided and awarded to the winning bidder. The rehabilitation of the building is up for bidding yet. Delivery of equipment is expected before the end of the last quarter of the year. When fully refurbished, the facility is expected to be used for production and as a shared facility for training through transfer of technology and other endeavors of the university.

Keywords: cacao, equipment, post-harvest, rehabilitation, upgrade

10:00 – 10:20

S203- Development and Evaluation of Automated System for Profiling of Student Organizations in the University of Southern Mindanao

Yvonne V. Saliling, Geraldine M. Quiñonero, Paul John B. Ongcoy and Ryan Z. Gonzaga

10:20 – 10:40

S206- Development of Rapid Technique for Analysis of Adulterated Wholesome Food Products: A combination of Spectroscopy and Chemometrics for Halal Food Analysis

Frederick John B. Navarro and Queennie L. Rufino

ABSTRACT. Chemical analysis plays an important role in establishing an effective Halal food management system in the region. Current methods include chromatographic and DNA based methods that involves hazardous chemicals, long analysis time, and complex sample procedures. Hence, this project aimed to develop a rapid technique on differentiating protein and fat sources in food and pharmaceutical products using Fourier Infrared (FTIR) Spectrophotometry in combination with chemometrics. Method development involves the identification of absorption bands of porcine and bovine gelatin/fat, optimization of FTIR setting and sampling, determination of wavenumbers in physical effects on samples, optimization of chemometric settings, and validation in real samples, The progress of the project from January to October involved the initial runs for spiked samples with gelatin and fat standards. The initial results were used for optimization of gelatin/ fat extraction. In current laboratory setting of USM, attenuated total reflectance (ATR) and direct reflectance (DR) were applicable for fat and gelatin film FTIR sampling techniques, respectively. The initial chemometrics result identified fat can be differentiated mainly with sp3 C-H stretch (2800-3000 cm-1), which was positively correlated with the C=O stretch (1700-1800 cm-1), and acyl C-O (1100-1200 cm-1). The initial analysis of chemometrics involving the calibration and cross-validation samples showed that the predictability of the normalized spectra can be improved from 90-110% to 98-100% if the calculations were selective to the identified wavenumbers, Food samples with less than 10% gelatin were difficult to analyzed using the film method compared to pharmaceutical samples with more than 80% gelatin. The project is limited with the current available supplies and materials. Last June, the FTIR light source has expired which contributed to the major challenges in continuity of the project. The pandemic continuously affects the progress of the project. Nevertheless, the project has identified topics for EIC materials for the adulteration of food and pharmaceutical products as a result from the initial market surveillance. The project also extends through possible collaboration and partnership with the regional halal laboratories.

Keywords: Fat, Gelatin, Protein, Infrared spectroscopy, Multiple linear regression

10:40 – 11:00

S208- Development, Standardization and Packaging of Nutri-foods for Emergencies

Jigzcel Divine F. Basoy, Ivy Mar B. Cabornida, Maribelle T. Piamonte, Leila S. Moscoso and Urduja G. Nacar

ABSTRACT. Nutrition is related to immunity and to the risk and severity of infections. Vulnerable groups specifically children, pregnant and lactating women, elderly, and those poorly nourished individuals are at a greater risk of various bacterial, viral, and other infections. Conversely, chronic or severe infections lead to nutritional disorders or worsen the nutritional status of affected people. Nutritionally dense food products must be made and must be introduced to consumers to give them options for healthy food choices especially during emergencies. The study aimed to develop, formulate and standardize nutritious foods for emergencies. These nutri-foods are made of underutilized and lowly ingredients that are available locally. The main ingredients used in the study were: coconut residue/"sapal" for the nutri-bar; vegetable and fruits leaves and flowers for nutri-juice and modified local delicacies made of rice and corn were adapted and vacuum-packed for cereal-based nutri-foods The study was able to formulate 3 types food products, namely: 1) nutri-bar, 2)nutri-juice, and 3) cereal-based nutri-foods. For the nutri-bars, the treatments were "sapal" with mixed raisins and nuts (T1), with mixed raisins and nuts + dried mango (T2) and with mixed raisins and nuts + dried pineapple (T3); Treatment 3 gained a like very much general acceptability. For nutri-juice, 6 commodities were explored: (Treatment 1), Ulasimang bato (Treatment 2), talinum (Treatment 3), cassava tops (Treatment 4), blue ternate flowers (Treatment 5) and aratiles tops (Treatment 6). Out of the 6 juices, Treatment 4 gained like very much acceptability. For the cereal-based nutri-food, "patil", (a dish meal providing the concept of having rice as staple added with sautéed chicken flakes) the treatment which was vacuum-packed for 3 days was rated with like moderately, while those vacuum-packed 2 days and 1 day were just rated like slightly. Nutritive value and proximate analyses were still on-going, along with the study on shelf-life. Other formulated cereal-based food products were "biko", a composite of malagkit corn and malagkit rice and suman "rimo" (combination of rice and monggo). These were still currently standardized for sensory evaluation, proximate analyses and calculation of production cost.

Keywords: development, standardization, packaging nutri-foods, emergencies

11:00 – 11:20

S225- Effective Rubber-Based Cropping Systems in North Cotabato

Adeflor G. Garcia

ABSTRACT. The project on "Effective Rubber-Based Cropping Systems in North Cotabato" was established in December 2019 at the University of Southern Mindanao Agricultural Research and Development Center, Kabacan, North Cotabato. The main crop is rubber planted on double hedgerows (2.75 m x 4.5 x 16 m). The mainplots represents the perennial intercropping system: Rubber + cacao, rubber + coffee, rubber + banana-cardava; and rubber + lanzones. The annual intercrops represents the subplot: corn, mungbean, cassava and eggplant. The

rubber maincrop attained the recommended height for branch induction after 10 – 12 months after field planting. Among the perennial intercrops, banana-cardava started to be productive after 12 months. Harvesting started in March 2021. Coffee has started flowering, while cacao and lanzones are growing well. There were three crop cycles of corn and mungbean intercrop planted on year 1 (2020) for all the rubber perennial mainplots. Cassava and eggplant annual intercrops has one crop cycle for the year 2020. The grain yield of USM Var 10 , green corn yield of sweet and glutinous corn were all comparable among the different perennial intercropping models. The mungbean yield for three crop cycles were also comparable among the perennial intercrops. The tuber yield of cassava and the eggplant yield did not differ significantly among the perennial intercropping models. Further, the yield levels of the annual intercrops were higher than the national average of corn, mungbean , cassava and eggplant. The annual intercropping models are now under field evaluation for the year two (2) performance under the four rubber based cropping models.

Keywords:

11:20 – 11:40

S226- Developing Robust Diagnostic Tools and Effective Chemical Formulation for Rubber and Companion Crops to Improve Rubber Productivity

Adeflor G. Garcia, Johnvie B. Goloran, Mel Chrisel A. Sales, Oscar J. Jurado and Argie P. Casis

ABSTRACT. The project, developing robust nutrient diagnostic tools and effective chemical formulation for rubber and companion crops to improve rubber productivity was materialized to evaluate the developed protocols for effective analysis of soil availability of N, P and K, and soil nutrient status in the study areas for improving nutrient management and productivity in the rubber-based cropping systems and to determine the most suitable soil nutrient indices for N, P and K as basis for deficiency correction and fertilizer recommendation for rubber plants. There were seven studies conducted to attain the objectives and are as follows: physicochemical status of soil as affected by the age of rubber (>6-<10 and >10 to <15 years old); Influence of mucuna, inorganic fertilizer and organic fertilizer in the soil physicochemical properties, plant nutrient content, growth and yield of rubber; macronutrient uptake of rubber at early stage of growth and development; Variation in nutrient stoichiometry of insect under mixed cropping systems; Elevation index on growth and latex yield of PB 260 and RRIM 600; Litterfall and nutrient dynamics in rubber; Determination of appropriate for soil testing method for N availability and establishment of optimum N levels for rubber; and Establishment appropriate soil testing methods for extractable P. BSA students of CA-USM were involved as part of their research study. The component studies were conducted on field (North Cotabato, Bayugan, Agusan del Sur). Results on the growth, cuplump yield, soil pH and EC in the studies: 1) physicochemical status of soil as affected by the age of rubber (>6-<10 and >10 to <15 years old); and 2) influence of mucuna, inorganic fertilizer and organic fertilizer in the soil physicochemical properties, plant nutrient content, growth and yield of rubber was presented. Under the study of physicochemical status of soil as affected by the age of rubber (>6-<10 and >10 to <15 years old), cuplump yield of rubber under the 7-year-old trees in USM, Kabacan, North Cotabato increases with fertilization in the month of May and June. Furthermore, soil

pH increases with fertilization under the 11-year-old trees in the same study location. Overall, cuplump yield tends to increase both in 7-year-old and 11-year-old trees in Kabacan, North Cotabato and Agusan del Sur. It may take time for a perennial crop-rubber to show significant influence on the cuplump yield of rubber. Under the study: influence of mucuna, inorganic fertilizer and organic amendment in the soil physicochemical properties, the application of inorganic fertilizer (RR) decreases the soil pH both in soil with and without mucuna.

Keywords: soil nutrient, fertilization, organic amendment, cover crops, cuplump yield

11:40 – 12:00

S227- Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Productivity and Profitability

Edward A. Barlaan, Cris Harvin Rey G. Calvo, Alvin John R. Quitel, Elcy Jane C. Naquitquitan, Kristine D. Paguntalan

ABSTRACT. Utilizing SSR markers for molecular fingerprinting of National Seed Industry Council (NSIC) Cacao recommended high yielding varieties (HYVs) is essential to ensure that quality planting materials (QPM) of genuine varieties are true-to-type with emphasis on parent or mother plants as source for clonal propagation. The study aims to identify and molecularly fingerprint parental sources of recommended cacao HYVs and true Criollo for multiplication of quality planting materials and to propagate the certified true-to-type cacao varieties as mother plant sources or genetic stocks for distribution. This is to guarantee that farmers are using the correct high yielding varieties for increased cacao production and income. Cacao nurseries accredited by the Bureau of Plant Industry – National Seed Quality Control Services (BPI-NSQCS) in cacao growing regions were contacted for collaboration of project implementation. Functional SSR markers are used to validate NSIC recommended varieties and differentiate true criollo types from non-criollo accessions. Five (5) accredited nurseries across region XII agreed in collaborating with the project. Leaf samples from different accredited nurseries were collected and stored. Claimed criollo-types leaf samples were sent thru courier from different regions of the Philippines. DNA of collected leaf samples from accredited nurseries and samples of claimed criollo-types were extracted and quantified as an initial step for further analysis. Polymerase chain reaction (PCR) amplification was done and validated SSR markers for UF18 and BR25 confirmed authenticity of NSIC released varieties. To ensure the continuous distribution of QPMs, cacao nursery has been established. As of now, around 4,000 root stocks are available for grafting. Collection of scion and grafting of seedlings from certified mother plants were witnessed and assessed by BPI-NSQCS 12. Grafted seedlings are ready for distribution to collaborating accredited cacao nurseries.

Keywords: Cacao, Criollo, Molecular Fingerprinting, High Yielding Varieties, Quality Planting Materials

1:00 – 1:20

S228- Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement

Gwen Iris D. Empleo, Ivy M. Pasquin, Jeannie R. Binaohan, Avigel I. Cabrillos,
Engela Maricris Gaoiran, Ryan C. Eder

ABSTRACT. The identification of Theobroma cacao L. clones that possess desirable traits for varietal improvement is essential to meet changing production and market conditions. This project addresses the problems on the relatively low yield and low bean quality in cacao, and the prevailing diseases and pests affecting cacao productivity. The main goal of this project is to carry out effective cacao breeding strategies for the development of cacao varieties with improved yield, bean quality, and resistance to diseases and pests. The project aims to rehabilitate the existing cacao gene bank in USM, enhance the cacao gene bank in USM through the introduction of additional cacao breeding stock, evaluate the morphological and agronomic characteristics of the cacao breeding stock for the development of the Philippine cacao catalogue, develop cacao hybrids with high yield, bean quality, or resistance to pests and diseases, and validate the F1 identity of the products of crosses using molecular approaches. To date, scions from 23 accessions/trees from the Davao region were collected and grafted at the nursery. A total of eleven cacao varieties/clones were used as parents in 19 cross combinations. Additional cacao accessions from local and international sources will be collected and added to the gene bank. Morphological evaluation of the existing cacao clones is ongoing and additional crosses will be generated.

Keywords: Cacao, gene bank, introduction, hybridization, breeding

1:20 – 1:40

S229- Development of Optimized Post-Harvest processing Approaches for Improved Quality of Cacao Beans

Renel M. Alucilja, Maricel G. Dayaday, Sheena B. Lucena and Lydia C. Pascual

ABSTRACT. Cacao bean quality significantly influences quality of cacao-based and products market price. Limitations such as inadequate knowledge and expertise in post-harvest processing technologies, unavailability of post-harvest processing facilities and lack of access to market information and high-value markets must be addressed. This study aimed to develop optimized post-harvest processing approaches for improved quality of cacao beans. The design for the development and optimization of a semi-automated cacao fermenting bin lessens labor through its mechanism. It is a self-mixing bin with the addition of automation to maintain the temperature inside the fermenting box and a monitoring system that allows the operator to determine the status of the fermented bean during the process. Benchmarking survey for the drying, fermentation, pod storage, and bean storage was done in different municipalities of Region XI and XII to determine the common practices to serve as control for innovation and optimization. Physico-chemical analysis determined the ash content, carbohydrates, crude fat,

crude fiber, crude protein, moisture, pH, theobromine and titratable acidity of processed cacao beans.

Keywords: Cacao, Post-harvest, Optimization, Benchmarking, Physico-chemical

1:40 – 2:00

S232- Smart Soil and Nutrient Management using Sensor Technologies to Increase Productivity of High Value Crops at the University of Southern Mindanao

Adeflor G. Garcia, Sheena B. Lucena, Jessie G. Elarde and Carlo D. Bacus

ABSTRACT. This is a component study of the project entitled "Harnessing Smart and Digital Agriculture Technologies of High Value Crops at University of Southern Mindanao" funded by the Dept of Agriculture Bureau of Agricultural Research from January - December 2021. The objectives are: 1) to develop a smart soil and nutrient management system for high value crops using sensor technologies; 2) to pilot new multi-sensor techniques for optimizing fertilizers to increase production of cacao, coffee, lanzones, pummelo, banana cardava and rubber. The six (6) experimental sites has been identified and prepared located at University of Southern Mindanao Agricultural Research & Development Center. Another site identified is at the DA Sateliite Station at Balindog, Kidapawan City still in North Cotabato. The multisensors are still at the procurement stage. The farm lay-out will be the same with the drip irrigation system.

Keywords: smart agriculture, sensor technologies, smart nutrient

10:00 – 10:20

S302- USM-CA Extension Services: Agrikonek gamit ang SocMed

Josephine R. Migalbin, Julius Jerome G. Ele and Tamie C. Solpot

ABSTRACT. Extension is one of the four-fold functions of the College of Agriculture, University of Southern Mindanao (CA-USM). As a college, the CA is active in the dissemination of technologies to farmers and other stakeholders of the University. Amidst the covid-19 pandemic, restrictions on face-to-face engagements have limited the college in providing extension services among its clientele. Therefore, this project was conceptualized to give support to the interested learners in fisheries and agriculture through the delivery of extension services via webinar using digital platforms primarily through Facebook (CA Facebook page). In the past eight months (October 2020-October 2021), the College of Agriculture has delivered 11 webinars in various topics in the field of plant pathology, horticulture, Plant Breeding and Genetics, and Animal Science. Eight of the speakers were faculty members of the college, and three were invited from other institutions. After each webinar, resource speakers are evaluated by the online participants, and e-certificates were given to those who successfully participated the webinar.

Keywords: agriculture, digital platform, Facebook, online, webinar

10:20 – 10:40

S304- Integrated Video and Audio Learning Services for Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2020)

Janice M. Bangoy, Ardniel A. Baladjay, Genghis Khan P. Manero, Allan Dalo, Jovelyn S. Gesulga and Myrna R. Tan

ABSTRACT. Educational institutions must prioritize finding effective methods of providing new learning opportunities according to their environment, student characteristics, teacher training, economic crisis, and technology advancement to make learning more efficient, equitable, and innovative in higher education. The University of Southern Mindanao Extension Services Office is making additional efforts to provide remote learning services via print, radio, video, online, and offline electronic resources to ensure the continuity of learning amidst the Covid-19 pandemic. These include printing and distributing technology production guide modules, broadcasting video lessons through the internet and radio, and are accessible through computer desktops, laptops, or mobile phones. In partnership with CAS, the project team trained 320 faculty and full-time researchers on IEC print materials development and reactivated the Extension Services Office Facebook page. The project team also produced twelve episodes of School-on-Air on Halal Goat Production, dubbed as "Teknogiya sa Radyo," on radio, live-streamed on Facebook, and uploaded on YouTube. The cacao production module developed is utilized by the ISEE project 2021 school-on-air. Two YouTube videos were also successfully uploaded via YouTube in partnership with the USM Multimedia Team and 4 IEC print materials on Halal Goat production. The project is still in the process of collecting data based on Bennett's Hierarchy Evaluation.

Keywords:

10:40 –11:00

S310- Sustainable Human Development and Resiliency (SHuDaR) Framework for the COVID-19 Pandemic-Affected Communities in North Cotabato Province

Ma. Dely P. Esberto, Joel V. Misanes, Samson C. Rapuza, and Manuel J. Tayong

ABSTRACT. The project intends to deliver technical services that can strengthen the community's capacity to sustain their welfare through building a resiliency framework to cope with the COVID 19 pandemic devastation. Specifically, it aims to empower the breadwinner of the family, provide livelihood options to augment their income, formulate policies and contingency plans on eco and biodiversity conservation and management to be institutionalized in their local government unit and capacitate the LGU and bgy officials to operate equipment for the solid waste management. The CTI program is composed of three project components namely: community organizing and project monitoring; capacity building and livelihood; and ecosystem and biodiversity protection and management. The first project component covers the main activities on social preparation and community organizing, impact assessment and evaluation and mid-term planning. The second one is intended to provide capacity building and knowledge management and livelihood project. The third component

includes interventions on solid waste management and biodiversity conservation. Most activities were implemented on the 3rd quarter of 2021. The main highlights of project implementation include the formulation of Workplan, MOA signing, conduct of TNA, Baseline Survey, SWOT Analysis, conduct of two skills training, symposium on Solid Waste Management, techno demo on shredder machine, and distribution of carpentry hand tools for their livelihood.

Keywords: Skills training, Carpentry, Driving, Basic Troubleshooting, livelihood

11:00 –11:20

S312- Curriculum Development and Offering on Halal Science and Scholarships for SUC Faculty on Halal Science

Josephine R. Migalbin, Ruby Hechanova, Luzviminda T. Simborio and Jurhamid C. Imlan

ABSTRACT. The project entitled "Curriculum Development and Offering on Halal Science and Scholarships for SUC Faculty on Halal Science" sought to promote the passage of Philippine Halal Export Development and Promotion Act of 2016 which necessitates that human resources be capacitated to ensure that consumers and users of halal products, process and services are protected. On the same vein, Garcia (2016) stated that "as the country aggressively initiates its plan to develop its Halal industry, a parallel effort should also be provided to HEIs to be integrated in the Halal value chain. The objective in general is to develop a curriculum on Halal Science for human capacity building of halal stakeholders with specific objectives such as to develop and implement a Certificate Course in Halal, train SUC faculty on Halal Science and develop a mechanism to sustain the program are sought after, especially by USM being the lead agency of the project. The methods include benchmarking of courses from established institutions abroad, review of courses to suit the need of Philippines, consultation with stakeholders, curriculum and module development, finalization and course offering. The problems they encountered, as well as the solutions they recommended, were also looked into. Moreover, the Certificate Course in Halal Science is ongoing as pilot course offered by USM and the outcome of this project shall be utilized as basis for enhancement and intensified promotion of Halal Science in higher education.

Keywords: RA 10817, Halal Science, higher education institution, curriculum development, scholarships

1:00 –1:20

S313- Market Analysis and Positioning of Processed Halal Chevon Food Products

Jalaloden B. Marohom, Ivy Mar B. Cabornida and Crystal Jhane A. Garate

ABSTRACT. Halal has been given attention due to consumer's concern on food safety, health, ethical concerns, among others. Chevon, a meat from goat, is an important source of protein. However, there are no Halal chevon products like corned, jerky and sweet cured that are commercially produced. Hence, the study aimed to develop positioning strategies to

commercialize the three processed products. A survey was undertaken to 400 respondents from selected municipalities and cities in the Philippines consisting of households, students, and travelers. Data elicited were analyzed descriptively. Spearman rank correlation and regression were also used to further the analysis. Majority of target market were willing to buy the products and their preferred label designs and trademark were registered. Based on Porcine DNA Detection result, products are negative of any pork derivatives. The result of microbial shelf-life testing also showed that products stored in constant 7 degrees freezer temperature lessen bacterial contamination until eliminated. Results showed that respondents are willing to spend less than an hour per week in buying and willing to pay up to PhP399.00. Of which, the former is significantly affected by both monthly income and educational attainment while only monthly income significantly affects the latter. Specific to Halal chevon, findings revealed that price and packaging are negatively related to frequency of buying jerky while packaging is negatively related to frequency of buying sweet cured. The price, brand, label, packaging, and availability are negatively related to frequency of buying corned chevon. Results revealed further that willingness to pay is positively related to frequency of buying products and highly significant towards estimated spending. Products were also rated as appealing, pleasant, tender, and tasty. Therefore, for products to be commercialized and positioned, proper packaging should be observed with clear and informative labels, has a Halal logo, easy to locate, and are tasty.

Keywords: Commercialization, Halal Chevon, Porcine DNA, Positioning Strategies, Shelf-life

1:20 –1:40

S315- Development and utilization of learning materials for community animal health workers

Elizabeth C. Molina, Lilian A. Lumbao, and AP Warren P. Adamat

ABSTRACT. Livestock production constitutes an important component of agricultural economy but due to some constraints such as the unavailability of veterinarians or animal technicians in rural areas, the location where animals were raised and at the present time, the existence of Covid-19 pandemic that causes movement restriction, animal health had been compromised. The development of community animal health workers (CAHWs) is a good intervention to address the situation. The aim of the study is to develop and utilize learning materials in the form of video clips for CAHWs to be equipped with the basic veterinary procedures which is an integral element in engaging animal-related activities and to evaluate usefulness of the said material in the development of CAHWs.

Keywords: agricultural economy, animal technician, livestock production, veterinary procedure

1:40 –2:00

S321- Tablea: Pangkabuhayan Para sa Kotabateňong Pamayanan: Community-Based Tablea Production for Sustainable Livelihood in Cotabato

Ardniel A. Baladjay, Janice M. Bangoy, Gwen Iris D. Empleo and Sheena B. Lucena

ABSTRACT. The COVID-19 pandemic negatively impacted the economic and agricultural sectors in the Philippines resulting in work displacement and loss of livelihood. These events opened opportunities to transform agriculture food systems including increased utilization of locally available food that would provide alternative sources of livelihood. Cacao (Theobroma cacao L.) is a highly valuable crop in the Philippine domestic and export markets. Cacao production in Region 12 is projected to increase which provides opportunities for sustainable livelihood to Cotabateños. This project aims to 1) capacitate cacao farmers, tablea makers, and displaced workers in selected cacao growing municipalities of Cotabato on cacao pre and post-harvest processing, tablea production and packaging, and product marketing; 2) promote the mature technology on tablea production using USM practices for adoption, and 3) generate additional income for the beneficiaries. The USM Tablea Team, in coordination with the LGUs of Antipas, Tulunan, and Aleosan, Cotabato identified three associations of cacao farmers: Antipas Cacao Growers Association (ACGA), Aleosan Cacao Farmers Association (ACFA), and Tulunan Cacao Growers Association (TCGA). The respective association leaders facilitated the selection of ten members who will undergo the training while the USM Tablea Team carries out the development of six training modules for various project activities and drafting of memorandum of agreement (MOA) for forging partnership between USM and organized cacao associations. Meanwhile, the Project Team was able to conduct one training with ACFA officers and members on pre and post-harvest practices and tablea production. Catch-up plan on capacity building through training was formulated to meet the expected outputs of the project.

Keywords: Tablea, Sustainable Livelihood, Cacao Farmers, Community-Based Production

2:00 –2:20

S323- USM-CA Ugnayan sa Magsasakang Moro at Katutubo

Josephine R. Migalbin, Tamie C. Solpot, Basser L. Mamalac, Geoffray R. Atok, Adrniel A. Baladjay, Jurhamid C. Imlan, Samsudin A. Panday and Jalaloden B. Marohom

ABSTRACT. The College of Agriculture (CA) with its extension arm has a goal of supporting marginalized farmer-sector by providing technical advisories in agriculture. A collaboration between the CA-USM and the NGO Islamic Relief Worldwide (IRW) was conceptualized to fulfill common goal. This project aims to support local farmers in four barangays of Datu Saudi Ampatuan, and Datu Odin Sinsuat, Maguindanao by giving technical trainings on crop and animal production systems to Maguindanaon and T'duray farmer-leaders. Prior to interventions, Rapid Rural Appraisal (RRA) was conducted by the IRW using structured questionnaire and data validation through focus group discussion (FGD). Major commodities

cultivated in the area are rice, corn, and vegetables. Major constraints identified includes the occurrence of pests and diseases, lack of knowledge on crop management practices, resulting to low productivity. Some farmers also engaged in goat, chicken, and duck production with disease problems identified as the main constraint and the lack of technical know-how on animal management practices. To address those challenges, 40 farmer-leaders were trained on crop and animal production and management in USM. It was followed by an on-site training involving actual demonstrations on vermiculture and organic concoction making. Moreover, actual advisories on farming practices were made on corn, rice, poultry, and goat raising in the area. With these trained farmer leaders, peer to peer training was also conducted to empower neighbor farmers in the locality. Capacitation of women's group on livelihood project such as dishwashing liquid, fabric conditioner, and powder detergent soap making; as well as duck raising, and egg production was also done for an added livelihood source. Beneficiaries were also trained for product branding, design, and marketing strategies for the existing local enterprise in the service area. An establishment of an on-site demo farms was also done showcasing vegetable, rice, corn, and animal production serving as model farms in the locality.

Keywords: agriculture, collaboration, extension services, Maguindanao, training of trainors

2:20 –2:40

S325- CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful Action) Amidst Covid-19

Sedra A. Murray, Marivic Candari, Bejian Arellano and Roel Valenton

Keywords:

2:40 –3:00

S326- "Ubing nga naalibtak": Fostering social resilience among grade school learners through moral and law-based education

Ivy S. Millare, Roselyn M. Clemen and Maricar U. Juaneza

ABSTRACT. Children are not exempted from experiencing anxiety and depression because of the difficult events that they experience in life. Evidence continues to accumulate on the short- and long-term risks to health and well-being posed by adverse life experiences in children, particularly when adversities are prolonged, cumulative, or occurring during sensitive periods in early neurobiological development (Traub & Boynton-Jarrett, 2017; Black, et. al, 2017). At the same time, there is increased concern about disasters, conflict, poverty, pandemics, climate change, and accompanying displacement having an impact on children's global well-being (Masten, 2014). These challenges become toxic stressors without proper moral, social, and practical education, and can eventually cause irreparable damage to a child. Fostering resilience and adaptive development in a child's intellectual, emotional, behavioral, and physical adjustment is a critical responsibility since it is how people overcome obstacles and deal with challenging situations. According to a study, children who are more resilient are best prepared to cope with stress, which is a normal response to tragedy. Resilience in the context

of working with primary school-aged children is defined as good interpersonal skills, high self-esteem, a positive outlook on the future, excellent interpersonal skills, and the ability to express and control emotions (Lantieri, 2008; Windle & Benne, 2008). This research explores the methods that can assist grade school students in developing the skills associated with resilience, such as developing a child's spirituality by (a)demonstrating God's love in tangible way and to share the good news of salvation, (b) introducing lessons about God, (c) guiding and nurturing the children on their spiritual journey; empowering children on their rights by (a)identifying learners rights and obligation, (b). empowering children of their rights; and lastly developing life skills by (a) familiarizing the learners to basic practical skills through household chores, (b). developing skills in managing money and resources, (c). strengthening emotional skills in facing stressful situations (d) enhancing skills in artistic expression. Furthermore, this study will be conducted with the grade school learners of Purok Kapayapaan, Brgy. Poblacion, Kabacan North Cotabato which will be focused on fostering their social resilience to improve their holistic development as well as obtain skills and perspectives that allow them to overcome significant challenges and adversity in their lives to able to adapt to circumstances and are more likely to succeed in school and beyond constructively and healthily.

Keywords: Social Resilience , Grade School Learners, Moral, Law based education, Skills

3:00 –3:20

S314- USM Wildlife Rescue and Research Center (USM-WRRC) as Agri-tourism Destination

Florence Roy P. Salvaña

ABSTRACT. The University of Southern Mindanao Wildlife Rescue and Research Center (USM-WRRC) is a facility which houses certain wildlife species that were rescued from communities. It serves as temporary or permanent sanctuary depending on the wildlife status. Wildlife rescued and rehabilitated will be categorized and observed for re-introduction as part of the re-populating process of the wildlife niche and translocation. This study aims to conduct rehabilitation and campaign programs through various platforms, establish IGP through wildlife ecotourism and an area for instructional purposes. Notable results include (1) development of brochures and website for USM WRRC; (2) development of guidelines for tours and visits for IGP; and (3) development of guidelines for the conduct of instructional activities. USM WRRC is a facility not only for wildlife conservation and management but also for ecotourism. It is recommended to develop additional sustainable plans for the center's operations.

Keywords: wildlife, ecotourism, conservation, income generating project, instructional purposes

3:20 –3:40

S332- DOST- PCAARRD and University of Southern Mindanao Agri- Aqua Technology Business Incubator

Pia Amabelle M. Flores, Jalaloden B. Marohom, Benjie B. Mar

ABSTRACT. USM begins its first phase of implementation as one of 16 ATBI's in the country under the banner program DOST-PCAARRD which will run for 2years. The TBI centers launched in SUCs are one of the mobilizations anchored by the "Innovative Startup Act" (RA 1137) which serves to satisfy the following objectives, to: 1) capacitate USM ATBI personnel; 2) identify and establish partnership with the incubatees; 3) identify and establish linkages aming agencies, clients, markets, and funding sources to sustain the operation of the ATBI; 4) provide technical assistance, business development services, marketing assistance, and administrative services to the incubatees; 5) enhance USM's technology transfer and product promotion efforts. As of its second year implementation, the project gathered total of 8 incubatees and 10 potential incubatees for startups through awareness seminar in the University and social media campaigns. Five (5) technologies were granted the "Fairness Opinion Report" to commercialize USM Corn OPV and hybrid corn technologies, drafted modules for TBI mentorship series, conducted 2 echo-seminars/ workshops and facilitated promotional activities through technology pitch days. The turmeric tea products of Ms. Elnora Flores were promoted in the National ATBI Week while BFLEX technology was qualified in the Top 9 finalists of Tech Planter Philippines. USM ATBI is working on its partnership with DTI in the future. The project also highlights the unveiling of the DOSTPCAARRD and USM ATBI marker at the USM DOST-PCAARRD Technology Center (DPTC) to commemorate the collaboration of two agencies to foster technology transfer through technology business incubation.

Keywords: USM ATBI, RA 1137, technology business incubation, Startup, incubate

3:40 –4:00

S333- USM IP-TBM Phase II: Patent Mining of Rubber Technologies Thru Intellectual Property and Technology Business Management (IP-TBM) Operations of the University of Southern Mindanao

Pia Amabelle M. Flores, Cyrelle M. Besana and Abegail B. Sauyen

ABSTRACT. The Patent Mining project is a continuing project of IPTBM funded by DOST-PCAARRD from 2021-2022 pursuant to Republic Act No. 10055. The on-going project serves to satisfy the following objectives: 1) capacitate the technology transfer personnel of the University of Southern Mindanao IP-TBM Office on patent mining; 2) investigate emerging rubber technological trends and recommend priority R&D programs through patent mining; 3) enhance IP policies and technology transfer protocols of other SUCs to harmonize IP management and technology transfer activities; 4) intensify linkages with various agencies to enhance activities on intellectual property protection and management and technology transfer and commercialization; and, 5) provide support to the development of the IP-TBM

Real-time monitoring system (RTMS). As of the third quarter of the project, following outputs were accomplished: facilitated 5 “Fairness Opinion Reports” to commercialize USM OPV and hybrid corn technologies, conducted 2 echo-seminars/ workshops on IP local and regional. The project consolidated IP assets including 20 filed Utility Models (UMs), 5 filed copyrights, 7 pending Trademarks, 12 registered copyrights and 4 UM registered UMs. The project also conducted Consultation Meeting for Rubber Industry Strategic S&T Plan (ISP) which participated by national industry partners, private sectors, technical experts, DOSTPCAARRD, IPOPHL and selected SUC’s. The project also highlights the re-unveiling of the IPTBM marker in the USM DOST-PCAARRD Technology Center (DPTC).

Keywords: USM IP-TBM, RA 10055, Research and Development, Technology Transfer, Intellectual Property, Technology Commercialization

8:20 –8:40

S329- Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS-Plans)

Leorence C. Tandog, Debbie Marie Versoza, Florie Jane Tamon, Benedict Entera
Shandra C. Gonsang and Astrofil Hyde Alcala

ABSTRACT. As a response to the restrictive situation caused by COVID-19 pandemic, basic education has embarked on the use of modules in the delivery of lessons. Learning of modules however proved to be difficult for students who lag in basic competencies and become similarly difficult for parents who have incapacity to provide the needed mentoring to schooling children. To lighten the burden of both parents and students in self-learning, some schools and teachers initiated the preparation of supplementary materials. In this endeavor, many teachers felt the need of experts to evaluate and suggest ways to enhance the quality of developed supplementary materials. In this extension project, teachers are assisted in the development of quality supplementary materials, in the refinement of instructional materials they initiated and in providing support for professional development of teachers. Generally, this project aims to provide support to teachers to efficiently facilitate the learning of essential competencies by the students. To carry out the aims of this project, needs assessments were done to determine the supplementary materials needed by the teachers, planning on project execution was held, and brainstorming between DepEd teachers and GS extensionists were conducted that resulted to development of materials. Of the four project components, the major material outputs include Mathematics booklets that focus on the foundational concepts of fractions; comic strip designs used as illustrations in learning activity sheets of grade 3 pupils under the MTB curriculum; mobile application that contained video clips for identified Physics topics; and a working device that runs offline or without internet and allows students and teachers download, upload and store files. An offline technology tool was developed to facilitate resource sharing and access of instructional materials in the remote area. The project was also able to assist group of teachers who sought suggestions for improvement of materials they developed before reproduction and catered to the need of teachers for training in content.

Keywords: Independent learning, competencies improvement, materials development, supplementary materials, offline technology

8:40 – 9:00

S303- Integrated Video and Audio Learning Services for Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2021)

Genghis Khan P. Manero, Janice M. Bangoy, Allan Dalo, Jasmin Pecho and Eugene Ranjo

ABSTRACT. Educational institutions must prioritize finding effective methods of providing new learning opportunities according to their environment, student characteristics, teacher training, economic crisis, and technology advancement to make learning more efficient, equitable, and innovative in higher education. The University of Southern Mindanao Extension Services Office is making additional efforts to provide remote learning services via print, radio, video, online, and offline electronic resources to ensure the continuity of learning amidst the Covid-19 pandemic. These include printing and distributing technology production guide modules, broadcasting video lessons through the internet and radio, and are accessible through computer desktops, laptops, or mobile phones. The Project launched its new radio program titled "Ugnayan Natin sa Radyo at TV" in March 2021, in addition to the Teknogiya sa Radyo at TV School-on-Air program (SOA). This program supports partner agencies in disseminating relevant information to the communities. To date, seven episodes have been aired together with partner agencies, with 66,650 viewers. The School-on-Air on Cacao Production will begin in November 2021 and will be airing weekly every Friday. The three organized beneficiaries (2 associations and one cooperative) will be from LGUs Antipas, Tulunan, and Aleosan. A cacao production printed IEC is produced, including a draft e-module on Cacao Harvest and Post-Harvest Processing. Bennett's hierarchy evaluation will be used to evaluate the School-on-Air on Cacao Production.

Keywords:

9:00 –9:20

S305- HEALS (Health, Environment, Agriculture and Livelihood Skills) for Sustainable Development 2020

Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Monaira Sumael, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva, and Joel V. Misanes

ABSTRACT. HEALS (Health, Environment, Agriculture and Livelihood Skills) for Sustainable Development was born out of the collaborative efforts of 13 extension coordinators from the different colleges of the university. The program involves the provision of holistic care to the partner community through capacity building, livelihood and entrepreneurship education, life skills and hard skills training to the agriculture, women and youth sectors in Dagupan, Kabacan, Cotabato. The program aimed to provide the beneficiaries in the partner community the chance to develop themselves as human resources equipped with the necessary skills to adapt and respond to the changing demands of time and of the world. To achieve its aim, HEALS component leaders conducted a series of Focus Group Discussions with Barangay and Youth leaders to identify the most pressing needs of the partner community and because of

restrictions on face-to-face training due to Covid-19 Pandemic. Initial results were presented back to the community for validation. The discussions highlighted the following needs identified by the partner community: (1) knowledge on poultry production, (2) processing, marketing, packaging and financial management of local products, (3) development of communication skills, (4) modular learning of learners and parents, (5) sports management, (6) development of livelihood skills, and (7) assistance on various agricultural needs of the community. By the end of 2020, most of the identified needs have been addressed. Specifically, the program has accomplished the following: 1) conduct of FGD and triangulation of results; 2) collaboration with the Extension Services Office in the provision of IEC trainings to Extension implementers among the colleges in the university; 3) conduct of 14 relevant capability building activities broken down as follows – four trainings delivered by I-LiFE, four delivered by SEEDS, four delivered by MOVER and two by DICTATE; and, 4) drafting of at least 30 Information, Education and Communication Materials subject for pre-testing in the community.

Keywords: Collaboration, livelihood, entrepreneurship education, agriculture, skills.

9:20 –9:40

S306- HEEALS (Health, Environment, Education, Agriculture and Livelihood Skills) for Sustainable Development 2021

Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Tamie C. Solpot, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva and Joel V. Misanes

ABSTRACT. HEEALS (Health, Environment, Education, Agriculture and Livelihood Skills) for Sustainable Development was born out of the collaborative efforts of 14 extension coordinators from the different colleges in the university. The program involves the provision of holistic care in the form of capacity and capability building, livelihood and entrepreneurship education, life skills and hard skills training as well as primary health services to various sectors in Barangay Dagupan, Kabacan, Cotabato. To date, the HEEALS Project continues to address the needs identified by the partner community through "Usapang 4K: Kalusugan, Karunungan, Kalikasan at Kabuhayan", USM Radio Program at DXVL KOOL-FM 94.9 mHz every Saturday from 11:00AM to 12:00NN to conduct training-on-air to the 20 beneficiaries from Barangay Dagupan. The program aimed to provide the beneficiaries in the partner community the chance to develop themselves as human resources equipped with the necessary skills to adapt and respond to the changing demands of time and of the world. To this end, HEEALS project aims to provide the community in Dagupan a chance to develop not only economically but also holistically. To date, HEEALS was able to 1) deliver one capability building activity on organic vegetable production, 2) distribute vegetable seeds to the attendees of the training on vegetable production, 3) recorded and aired a total of fifteen (18) episodes on its Usapang 4K Radio program. The episodes were recorded by the following colleges: College of Science and Mathematics – 3; College of Veterinary Medicine – 4; and College of Health Sciences – 1; Institute of Middle East and Asian Studies – 2; College of Human Ecology and Food Sciences – 2; College of Business, Development Economics and Management – 3; College of Engineering and Information Technology – 1; and Department of Psychology - 2.

Keywords: Capability building, livelihood, entrepreneurship education, life skills training, hard skills training.

9:40 –10:00

S307- Harnessing the SMART and Digital Agriculture Technologies of High Value Crops at University of Southern Mindanao

Ardniel A. Baladjay, Janice M. Bangoy and Adeflor G. Garcia

10:00 –10:20

S308- Establishment of Urban Agriculture at University of Southern Mindanao

Joan P. Sadoral, Purficacion O. Cahatian and Adeflor G. Garcia

ABSTRACT. An urban agriculture project was established at University of Southern Mindanao (USM), Kabacan, Cotabato from July to December 2021. The project specifically aims to: a) produce oyster mushroom (*Pleurotus* sp.) as source of safe, nutritious, and affordable food for dwellers in the area and nearby localities; b) showcase mushroom production technologies utilizing organic farm waste, for potential growers and adapters; c) produce vegetables and other crops, and promote community gardening for sustainable source of food and alternative income source of people in the area; and d) exhibit novel agricultural practices for improved yield of selected vegetables. Isolation, culture purification and maintenance of the isolate were carried out. Mushroom spawns were prepared and kept inside the laboratory; while preparation of substrate (mixture of rice straw and bagasse) for fruiting bags is on-going. For community garden establishment, plots were arranged according to lay-out and plans previously prepared. Crops such as tomato, pechay and eggplant underwent pre-germination process prior planting; while lady's finger, bitter gourd, bottle gourd, pole sitaw, squash, malabar spinach, sweet potato and water spinach were directly established in the project area. Management of vegetable crops particularly weeding, watering, installation of trellis, monitoring of pests and diseases, and other practices were properly employed.

Keywords: community gardening, food security, mushroom production, sustainable agriculture

10:20 –10:40

S309- Production of Tissue-Cultured Banana (Saba/Cardava) Planting Materials

Harem R. Roca, Jane R. Desamito, Carl Jonas D. Gocotano, Analyn V. Matutis, Janine Joyce F. Develleres, Raffy James P. Balancio, Gelan Mae S. Tudlas and Esmael I. Molero, Jr.

ABSTRACT. This study was conducted to upgrade the USM Tissue Culture Laboratory with manpower, facilities and equipment for efficient propagation of 'Cardava' bananas, particularly to improve/upgrade in vitro propagation facilities and manpower at USM Tissue Culture

Laboratory, acquire state-of-the-art tissue culture laboratory equipment, mass propagate 'Cardava' banana meriplants for distribution to farmer beneficiaries in Region 12 and media formulation specific for 'Cardava' banana. A total of 783 suckers were collected and used as initial explant. The lab has produced a total of 7258 bottles of 'Cardava' banana which is equivalent to 43,548 shoots. USM must produce at least 125,000 meriplants of 'Cardava' after 1 year of implementation. Continuous propagation is being done to meet the required quota for the succeeding months.

Keywords: Tissue Culture, Meriplants, 'Cardava', culture media

10:40 –11:00

S311- Community Based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Food Products

Analyn A. Gonzales, Jul-Aida U. Enock, Metche Ann L. Logronio, Jeannie U. Duka, Mitzi Aileen M. Alba and Charisse Angela S. Quiambao

ABSTRACT. The College of Business, Development Economics and Management through its extension and community services is guided by its mission for community development through advocacy, technology transfer, consultancy and other support services. The college identified Barangay Kayaga as one of the areas of concern in the Municipality of Kabacan, leading to the creation of the Community-Based Development and Economic Mainstreaming (CBDEM) on promotion of Halal Food Products. Through the help of the CBDEM extension project of USM, the Maguindanaon population in the Barangay Kayaga will produce products out of their available resources. The beneficiaries can produce Halal meat products and processed products suitable for their consumption which ensures the features and quality of the products according to the rules established by the Islamic Council. The college believes that it has the economic advantage that will help both Maguindanaon and non- Maguindanaon entrepreneurs, investors, and advocates. The five departments in the college will be an instrument to the growth of Halal food industry. The college conducted a total of four (4) trainings to the twenty beneficiaries from Kayaga Women's Group. The Department of Development Management conducted two (2) trainings entitled, Project Identification and Action Plan, and Leadership Training and Teambuilding; Financial Literacy for the Department of Accountancy and Enterprise Planning and Budgeting for the Department of Agricultural Economics. The training and workshops conducted will serve as preparatory activities for the conduct of Product Development, Processing, Pricing and Marketing of Halal Kagikit Food Product to be spearheaded by the two departments of the college, the Department of AgriBusiness and Business Administration.

Keywords: Collaboration, promotion, development, economic, management

11:00 – 11:20

S301- Implementation of Upgraded Consultancy Services and Technical Assistance for MSMEs through Consultancy for Agricultural Productivity Enhancement (CAPE) Program

Ardniel A. Baladjay, Edward A. Barlaan, Mary Joy S. Cañolas and Janice M. Bangoy

Keywords:

11:20 –11:40

S322- SOXAARRDEC: Kaagapay ng magsasaka sa Krisis at Kalamidad

Elizabet C. Molina, Ardniel A. Baladjay, Siony Brunio and Analyn Derequito

ABSTRACT. In response to the Bayanihan to Heal as One Act, PCAARRD launched GALING-PCAARRD (Good Agri-Aqua Livelihood Initiatives Towards National Goals) Kontra Covid-19 in response to the government's efforts against Covid-19 pandemic. Pagkain at Kabuhayan sa Pamayanan which supports various food production and livelihood projects such as Gulayan sa Pamayanan, Tilapia para sa Pamayanan, and Manok at Itlog para sa Pamayanan is one component of the program. As a response, SOXAARRDEC initiated the project SOXAARRDEC: Kaagapay ng Magsasaka sa Krisis at Kalamidad) as an initiative under the Gulayan sa Pamayanan. It aimed to establish initiatives in selected rural communities in SOCCSKSARGEN to increase household food security and resiliency during times of calamities and disasters. The project benefited 180 households thru vegetable production (eggplant, tomato, "sinigang" pepper, pechay, and sitao). From an average of 50 sq. m. production area allocated per farmer, a positive net income was obtained by each farmer. Ten glutinous corn gardens were established which also provided either income or food for the beneficiaries. The community-based vegetable nursery produced vegetable seedlings which were distributed to 40 farmers. This facility is continuously producing seedlings for distribution. Five vermicomposting facilities were established

Keywords:

11:40 –12:00

S324- CED Cares (Community Assistance thru Research and Extension Services): Development and Utilization of Flexible Teaching Guides in Science

Ellen Joy M. Farala, Bailyn M. Mantawil and Faith P. Buned

ABSTRACT. The project CED CARES (Community Assistance thru Research and Extension Services): Development and Utilization of Flexible Teaching Guides in Science was proposed to deliver the results of a research conducted by the College of Education faculty members on the developed and validated flexible teaching guides in Science for secondary and elementary teachers. The project aimed to provide training-workshop for newly hired teachers on the

utilization and development of flexible teaching guides using lesson study method and 7E's approach for Earth Science and elementary science in the basic education level to help them cope with the demands of the challenging time brought about by pandemic wherein the delivery of instruction must continue using different modalities and deliveries of learning and improve on their teaching pedagogy to become more effective teachers as well as for their professional development. The target beneficiaries were the sixty (60) teachers coming from both elementary and secondary levels. The training was conducted virtually and lasted for 3 days were participants were able to produce lesson guides in Meteorology, Geology, Astronomy and Oceanography for use in the teaching of science.

Keywords: lesson study, 7E's, flexible teaching guides, Science, lesson study method

1:00 –1:20

S335- University of Southern Mindanao Futures Thinking for Food Security, Systems, Innovations and Sustainability

Francisco Gil. N. Garcia, Edward A. Barlaan, Ma. Teodora N. Cabasan

ABSTRACT. Futures thinking is a future-oriented mindset through a systematic method of exploring alternative futures. There is a great need to create futures for agricultural developments, innovations and systems to ensure sustainable production, profitability and food security. The program aimed to provide directions through capacity building for futures thinking for food security, systems, and innovations to leaders, faculty and researchers in University of Southern Mindanao (USM) and collaborating HEIs and agencies; to develop R&D futures for banner commodities in USM; and to identify and implement strategies for food production and innovation to address food security amidst pandemic crisis. With the assistance of the Philippine Futures Thinking Society (PhilFutures), futures capacity-building workshops and futures research and development were curated in USM. Futures capacity-building workshops were conducted, such as Futures Thinking Master Class, which was attended by different institutions and agencies in Mindanao, and USM-based Scenario and Strategy Development and Moonshot Thinking Innovation Lab. The workshops provided outputs, which highlighted the contributions of the USM faculty researchers in the development of Futures research in agri-based initiatives for food production and innovation. Four groups were identified for futures thinking-related projects and activities such as cereals, high-value crops, Halal and protein sources. Brainstorming and crafting of programs/projects were conducted by each group for futures thinking-related research proposals on emerging or innovative technologies for external funding. Likewise, project proposals were developed to address food security amidst the pandemic crisis. The proposals are currently waiting for implementation. These projects are USM's stepping stones into embarking and pioneering futures thinking for food security, systems, innovations and sustainability.

Keywords: development, foresight, food systems, innovations, research

1:20 –1:40

S327- Teacher Nanay: Mothers Today, Teachers Tomorrow

Glyn G. Magbanua, Shandra Gonsang, Erwin Mallo, Jerose Molina, Sofia Loren Neyra, Maricar Juaneza, Mariz Balquin and Vicente Delos Reyes

ABSTRACT. The Extension Project Teacher Nanay: Mothers Today, Teachers Tomorrow was conceptualized to provide needed services to a small number of mothers in the Igorot Community in Cuyapon, in ways that would help them educate their children at home, keep their and their children's mental health in check, and generate income at this time of the pandemic. Built on the understanding that extension services are primarily responsive to the needs of the community, the project underwent several stages of consultation and need analysis. The identified needs were classified as Education, Health and Livelihood. To date, the project continues to conduct capability building activities among the mother beneficiaries in the partner community. Content analysis and development of instructional materials to address the identified need on education is likewise underway. Finally, mental health session and capability building as well as a medical mission have also been scheduled.

Keywords: education, livelihood, indigenous peoples, community resiliency, culture

1:40 –2:00

S328- English Language Intensive Training for Excellence (ELITE)

Ronel A. Naringahon, Marlyn A. Resurreccion, Lloyd Anton Von M. Colita, Ana Marie B. Uyangurin, and Edna Luz T. De Guzman

ABSTRACT. This literacy training by the Department of English Language and Literature (DELL) entitled *English Language Intensive Training for Excellence (ELITE)* intends to advance the research and journalism skills of teachers in Datu Mantawil Memorial Elementary School (DMMES). DMMES is situated in Brgy. Salapungan, Kabacan, Cotabato. With the vision of the Department of Education to enhance the research and journalism skills of teachers in DMMES, DELL, through ELITE, aims to holistically improve the mastery of the nine (9) teachers in action research and journalism to maximize the teachers' full potential. During the initial stages of ELITE, the Department accomplished an in-depth analysis of students, teachers, stakeholders, and the administration profile. Specifically, need's analysis, environmental scanning, and inception were accomplished by the researcher. Thus, ELITE intends to make the following four (4) workshops: action research, journalism, and technical writing workshop. Each program has the following phases: post-test, training, culminating activity, and output evaluation. To comply with the health protocols due to the current pandemic, the teachers of DMMES and DELL agreed to online mentoring through GMeet and limited face-to-face training sessions. Currently, the Department Coordinated with BLGU Salapungan. The Baranggay expressed concern in allocating the budget for ELITE. Thus, a linkage has been established in the target community. Also, DELL distributed to school and reading materials to DMMES. The teachers received the program positively, considering that they integrated the mentoring services of DELL into their work schedule.

2:00 –2:20

S331- Enhancement of Enterprise, Marketing and Financial Practices Among Registered Tricycab Drivers and Owners (TDO) Of Kabacan

Analyn A. Gonzales, Jalaloden B. Marohom, Mitzi Aileen M. Alba, Nerissa G. Dela Vina and Cheryl L. Dulay

ABSTRACT. The members of Tricycab Drivers and Owners of Kabacan (TDO-KABACAN) was organized with the purpose of uniting all the drivers and operators who are used to transport commuters to their respective destinations. This organization was decided to be registered in the Department of Labor and Employment with the purpose of protecting, enhancing and defending the interest of its members for their mutual aid and protection, the following objectives were identified: (1) to uplift the living condition and life of its members; (2) to design and undertake activities for the benefit and welfare of its members and the organization, including projects not contrary to laws; (3) to coordinate and collaborate with proper government agencies and other rural workers organization for certain lawful undertaking; and (4) to engage in any economic or entrepreneurial venture for the benefit of the organization. Apparently, the members experienced various concerns and problems such as oil price increase, renewal of their franchises, licenses and registrations, maintenance of their units and significant others. In order to provide the stated concerns and problems, there were times that they could jeopardize the basic needs of their families. Likewise, drivers' insufficient income to sustain the basic needs of their family. Especially this COVID 19 pandemic, their primary source of living was extremely affected. With this, the organization with 20 tricycab members' desires to provide another source of living that could help uplift the lives of its active members through a Sari-Sari Store project aside from having existing Token Car wash businesses funded by the Department of Labor and Employment (DOLE). This EMarFin project of the Business Administration Department will provide an opportunity to generate additional income for the Tricycle Drivers in Kabacan by capacitating them with Enterprise Marketing and Financial Practices. Thus, it would help the beneficiaries to improve their economic conditions.

Keywords: Capacitate, Marketing, Enterprise, Financial, Economic

2:20 –2:20

S336- Capability Building of Rubber Stakeholders and Role of Women and their Children in Natural Rubber industry in Agusan del Sur

Mary Rodelyn Cariaga and Razel O. Montemor

ABSTRACT. This project is part of the program entitled Land Management of Diverse Rubber Based Systems in Southern Philippines (SLaM 2017/040) funded by Australian Center for International Agricultural Research (ACIAR) and Philippine Council for Agriculture and Aquatic Resources Research and Development (PCAARRD) with a duration of three (3) years, June 2019- May 2022. This effort aims to boost the household incomes for indigenous smallholder farmers in the uplands of southern Philippines particularly in Agusan del Sur through the introduction of profitable rubber intercropping systems, sustainable management regimes and

capacity building. Based on the initial findings from the baseline data, the following training needs where identified by the smallhold rubber farmers in Agusan del Sur: (1) Rubber Production and Tapping Techniques; (2) Pest & Diseases Identification and Management and (3) Training on how Improve Soil health in relation to Rubber Fertilization Management. Different municipalities were recipient of the trainings which were participated in by both men and women rubber farmers. To date, trainings are still on going based on the identified schedule provided IATF rules were strictly being followed.Review of Related Literature

Keywords:

9:00 –9:20

S421- Students' Academic Performance Using Online Synchronous and Asynchronous Teaching Modalities

Saima M. Andil, Jikiri M. Entol, Remedios C. Kulidtod, Abdulnasser G. Makalugi, Norjaida D. Maliga and Sofia G. Molao

ABSTRACT. The COVID-19 pandemic has shifted the delivery of instruction from actual face-to-face to diverse online learning platforms. The online learning is currently applied by the faculty of the University of Southern Mindanao. The faculty from the Institute of Middle East and Asian Studies have applied the asynchronous and synchronous modalities. However, its effectiveness is still a subject for experimentation. The overall objective of this study was to determine any significant difference between the results of teaching platforms. The selected IMEAS students served as the respondents. The mean scores obtained from the conducted pre-test and post-test using asynchronous and synchronous delivery of instruction were gathered and compared. The six (6) faculty handling different courses had applied both modalities in their own respective students. Results revealed that most students performed better on synchronous modality. The gain scores of students under the subjects World Geography, Halal Food Processing I and History of Muslims in the Philippines were higher when they were given the synchronous teaching modality. The Research Method in International Relations, Halal Medicine and Health and Seminar 2: Global Politics and International Security could be effectively taught using any of the teaching modalities. Data generated from this study showed that there are subjects recommended for synchronous modality which could result to better performance of the students.

Keywords: Asynchronous, synchronous, pretest, post-test, modalities, delivery of instruction.

9:20 –9:40

S425- My Parents, My Teachers: Continuing Education Amidst Covid-19 Pandemic

Marcos F. Monderin, Vicente Delos Reyes, Mirasol O. Verona, Khristine Joy Garcia, Rosemarie Sison and Roselyn Clemen

9:40 –10:00

S426- Educational Innovations in Rural and Remote Communities: A Multi-dimensional Approach

Leorence C. Tandog, Debbie Marie Verzosa, Bonifacio Solsoloy, Joy Gloria Sabutan, Astrofil Hyde Alcala, Shandra Gonsang, Benedict Entera

ABSTRACT. Rural and remote communities face multiple barriers to education and educational opportunities and often occupy the margins in educational research. This project initiated a multi-dimensional approach to respond to the challenges of students and teachers from these communities emerging from the urgent educational changes driven by the Covid-19 pandemic. Results from phenomenological study and needs assessment survey reveal independent learning through modules, unavailability of supplementary materials to facilitate/augment learning, connectivity, and resource distribution and access as the main educational challenges during the pandemic. The project addressed these challenges with the introduction of technology and teaching innovations that cater to the broad range of needs of students. The field test for the developed offline technology Pinoy Pi proved the efficiency of the tool in providing solutions to issues regarding material resource sharing, delivery, and access deriving from educational adaptations during the Covid-19 pandemic. The device also served as delivery platform for the teaching innovations developed in this project. The teaching innovations used various instructional media and technological tools that utilized interactive elements and manipulable representations. Results from field observations and experimental study reveal a significant contribution of the teaching interventions on students' independent learning of essential skills in mathematics, language, and science.

Keywords: technology innovation, teaching innovation, representational approaches, educational challenges, independent learning

10:00 –10:20

S428- MATYA TANU (Magbasa Tayo)

Shandra C. Gonsang, R. Sison, ML Calibayan, W. Aquino ,N. Du, FM Reyes, N. Pabinal, R.Sugadol and B. Wali

ABSTRACT. Ang pagbasa ay isa sa mga mahahalagang makrong kasanayang pangwika na dapat na malinang sa mga batang mag-aaral. Nakasasalay sa husay nila sa pagbasa ang pag-unawa sa mga konsepto at impormasyong kailangan nilang matutunan sa loob at labas ng paaralan. Naging malaking suliranin ng DepEd ang ulat na marami pa ring bilang ng mga kabataang nasa loob ng paaralan ang di nakakabasa ng mga tekstong Filipino. Kabilang sa mga paaralan na nakitaan ng mababang antas ng kasanayan sa pagbasa ay ang Datu Mantawil Elementary school sa barangay Salapungan Kabacan, Cotabato kaya nilayon ng Kagawaran ng Wika at Panitikang Filipino ng CASS na gumawa ng programang pang ekstensyon para matulungan ang mga guro ng nasabing paaralan na maiangat ang antas ng kasanayan ng mga mag-aaral sa pagbasa.

Keywords: Pagbasa, Kasanayan, Antas, Maiangat, Filipino

10:20 –10:40

S434- Coffee Table Book: Dokumentasyon ng mga Mahahalagang Bagay at Tagpo sa Buhay ni Bai Hadja Fatima Matabay N. Plang -MIT-USM Founder)

Shadra C. Gonsang, Meriam M. Rubio and Radji A. Macatabon

ABSTRACT. Pangkalahatang layunin ng proyektong ito ang dokumentasyon ng/sa mga mahahalagang tagpo at pangyayari sa buhay ni Bai Hadja Matabay N. Plang, ang nagtatag ng ating pamantasan. Tiyak na layunin nito ang makolekta ang mga lumang larawan ni Bai Hadja Fatima Matabay Plang mula sa mga kaanak at kaibigan; Mailarawan ang mga kaganapan sa likod ng mga nakolektang larawan sa buhay ni Bai Hadja Fatima Matabay N. Plang. at makabuo ng isang "coffee table book" na naglalaman at naglalarawan ng buhay ng founder o tagapagtatag. Kwalitatibo ang disenyong ginamit, dulog historikal naman ang paraan na sinunod sa pangangalap ng mga datos at deskriptib-analitik sa pagsusuri ng mga datos.Kinolekta at tinipon ang mga larawan mula sa mga kaanak ng founder. Inayos ang lahat ng mga nakuhang larawan. Isa-isang ipinrint ang mga larawan sa bond paper. Inumpisahan ang paglalagay ng maiikling deskripsyon. Sa kasalukuyan, dahil sa mga travel restrictions, inieskedyul pa ang pagbabalik sa mga pinanggalingan ng mga larawan para sa balidasyon at pagwawasto ng ginawang deskripsyon. Naging malaking suliranin ng mga mananaliksik ang kawalan ng pondo at pagtutugma ng mga iskedyul ng bawat isa sa proseso ng pagbuo ng proyekto.

Keywords: Coffee table book, Tagapagtatag, Bai Hadja Fatima Matabay Plang, MIT-USM, Pagpapahalaga

10:40 –11:00

S430- Establishing Baseline Agriculture Performance and Rural Development Indicators from A Governance Perspective

Francisco Gil N. Garcia, Geoffray R. Atok, Nerissa G. Dela Vina and Jennet R. Mag-aso

11:00 –11:20

S431- Study on the Utilization of Marang Fruit (*Artocarpus odoratissimus* Blanco) and Assessment of Fruit Production in Mindanao

Norma U. Gomez and Roy B. Gacus

ABSTRACT. The general objective of this project is to study the utilization and assessment of fruit production of marang fruits in Mindanao. In conducting this project, the team used a triangulation method like archival research, key informant interviews among the key players along the chain (one-on-one interview, telephone interview/mobile/email communication),

benchmarking, competitiveness, profitability, and efficiency analysis. Results revealed that there is an underutilization of marang fruit in the Philippines wherein there is a wider gap between the supply and utilization and experienced ups-and-downs in three decades. Particularly in Region XII, the largest production of marang can be found in Cotabato Province (particularly in Makilala, Magpet and Kidapawan City). Information from farmers in Region XI is taken into consideration like socioeconomic and farming characteristics, volume produced per marang variety, number of marang trees and volume of production, harvesting practices, type and number of buyers/traders, farmgate and selling price of marang, volume sold during peak and lean seasons, method of selling, selling arrangement, mode of payment, volume and value of wasted/rejected marang during peak and lean seasons, cost and return pertree of marang production during peak and lean seasons, and critical logistic issues/problems.

Keywords: Marang buyers/traders, marang farmers, peak and lean season, and Region XII

11:20 –11:40

S424- Intermediate Teachers' Competence and Readiness in Teaching Writing in the English Language

Marcos F. Monderin, Reizelle Mae C. Amilbahar, Rhodora A. Melgar, Marlyn A. Resurreccion, Jerose L. Molina, Khadiguia O. Balah, and Lawrence Anthony U. Dollente

ABSTRACT. MURRAY, SEDRA A. 2021. CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful action) Amidst COVID 19 Kabacan, North Cotabato. Humanity is facing a health crisis nowadays which need to be addressed by working hand in hand from all walks of life. Although COVID pandemic seems to hinder mobility and all, when the determination to help is strong, then the goals of creating a difference in a target community will be achieved. CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful action) Amidst COVID 19 of the College of Science and Mathematics aimed to 1). equip the beneficiaries with vocational/ livelihood/technical skills that ensure productivity like bamboo craft making, virgin coconut oil and soap making); 2) develop appropriate skills and self- reliance through the provision of biodiversity conservation, protection and or management, health, and technology; 3) enhance the technological capabilities of the community in utilizing available resources in their Barangay; 4) develop in rural folks the determination and value of hard work in putting into action skills introduced to them and motivate them to be empowered individuals who will serve as social and economic resources in their community; 5)create a sound policy together with the community and LUGs for the promotion of eco-tourism in Pisan; and 6) enhance math and physics teachers' competencies/teaching strategies in line with the latest platforms in online learning. A courtesy call was made to the Barangay Captain, Marlyn Bagoisan introducing to her the extension program of the CSM for the S.Y. 2021-2022. The project envisioned to utilize available resources in Pisan like bamboos and coconuts as a means of additional income for livelihood. Utilization of resources starts with introduction of technologies on Coco products like Virgin Coconut Oil, Soap and Vinegar making. On September 22-23, the CSM extension unit and some faculty members conducted workshop on VCO making. It was followed by soap making from VCO and ordinary coconut oil and vinegar making from coconut water on October 25-26, 2021. Said coco products will be of great help to improve economic status of the

grassroots in Pisan. Accompanied with the livelihood skills workshop is the organization of a cooperative to help beneficiaries establish and construct building for the mass production and display of coco products.

Keywords: Assistance, Services, Workshops, Community Empowerment, Self-Reliance

11:40 –12:00

S422- Development of Online Educational Contextualized and Indigenized Instructional Material Supplementing IP quality of Educational

Amme Rose L. Blonto-Nonol

ABSTRACT. The study is entitled Development of On-Line Educational Contextualized and Indigenized Instructional Material Supplementing IP Quality of Education. It aims to create on-line Instructional Materials (IMs) to supplement Indigenous Peoples (IPs) access to education, pursued to support CHED Memorandum Order No. 2, 2019 which was created for the Integration of Indigenous Peoples Studies/Education into the relevant higher education curricula.

Materials are developed, contextualized, and indigenized using Instructional System Design: ADDIE Model: Analysis, Design, Development, and Implementation (Watson, R). The analysis and design were founded on USM IP learning profile in 2019. Validation is also part of the process before pilot testing. Prior to pilot testing, the materials are subject to pre-test of 12-15 respondents then follows pilot testing to a minimum number of 30 and maximum of 100 respondents.

This study is still in ON-GOING status and it has gathered the following initial results within three quarters time span: created videos for Tboli, Erumanen ne Menuvu, Teduray and Blaan Tribal groups out of IP TOME-USM coffee table book entitled *Faces of Diversity*; wrote one original piece in Tboli perspectives and contextualized it into two more cultural groups- the Erumanen ne Menuvu and TagaKaolo)-a supplement material to SC Eng 312 Teaching English in the Elementary; and integrate indigenous knowledge to SocSci2 Peace and Development. These materials are still in the pilot testing stage.

1:00 –1:20

S423- Tracer Study of the University of Southern Mindanao Criminology Graduates

Richard T. Camara

ABSTRACT.

- At present, there were 47 responses out of 338 population in this study.
- Sent an individual message and link of tracer survey via messenger to the respondents.

- Requested the USM BS Criminology alumni officers to help reach out the respondents.
- Sent the link of tracer survey via facebook.
- Sent the link for USM Criminology tracer study survey to the other GC like Kabacan Municipal Advisory Council (MAC), Kabacan MPS.
- Sent letter request to the NAPOLCOM Region 12 to seek assistance or endorsement.
- Sent letter request to the Philippine National Police Regional Office 11, 12 and BARMM.

Keywords:

1:20 –1:40

S427- Enhancing Ethics, Professional Responsibility and Lifelong Learning Competence of Engineering Students Through Outcomes-Based Teaching and Learning (OBTL) During Pandemic

Kharlo J. Subrio

ABSTRACT. This study aims to design, implement and evaluate an instructional system that employs outcomes-based teaching and learning (OBTL) in the enhancement of the competence of engineering students in terms of ethics, professional responsibility and lifelong learning and its impact on their learning approach and experience. Before the start of the class, data was gathered from the students in terms of their connectivity, device used, learning preference and prior knowledge. Results serve as input to the design of the Course Outcomes and Course Syllabus. Then pre-test was administered in which the level of knowledge based on the intended learning outcomes (ILO) was determined. Problems encountered during the study were unstable internet connectivity, unavailability of materials and resources, lack of motivation and low engagement among the students. The researcher tried to remedy them by utilizing Facebook as the online platform for asynchronous delivery since it can be accessed with free data and making occasional synchronous sessions through Messenger Rooms and Google Meet to discuss their concerns and motivate them in their studies.

Keywords: Ethics, Professional Responsibility, Lifelong Learning, Outcomes-Based Teaching and Learning, Engineering

1:40 –2:00

S433- Supply Chain Analysis of Pummelo in Selected Regions of the Philippines

Joeteddy B. Bugarin and Kathleen Ivy Z. Bolotaolo

ABSTRACT. The country's pummelo production has been declining since 2003 and the industry clearly waits for a needed intervention. Providing better opportunities in increasing the farm level incomes in the industry necessitates specific interventions in increasing productivity, improvements in production process to improve the low quality of pummelo produced and post-harvest handling of the product to avoid significant losses in the marketing system and increase overall pummelo production in the country. To evaluate the performance of existing pummelo supply chains and determine the effect of improvement that would be employed, specific key performance indicators under the three-dimensional definitions of efficiency, flexibility, responsiveness, and food quality were employed. However, no definite conclusions can be drawn as data is not yet complete at this point. Hence, all that will be presented herein were all initial findings only.

Keywords: Supply chain analysis, pummelo, key performance indicators

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40th In-House Review Proceedings

"USM RDE: Fostering Activities f
Building Adaptive Communities"

October 21-22, 2020
Café Martina, USM
Kabacan, Cotabato

Table of Contents

RATIONALE

This Research Development & Extension (RDE) Agency In-House Review is an annual/yearly activity of the University. The main objective is to review and evaluate all on-going and completed Research Development and Extension Programs/Projects/ Studies. This serves as avenue for all researchers, extension workers and other stakeholders to convene and exchange new knowledge or products generated and development/extension strategies relevant to the University's vision, mission, and objectives. It is also through this activity that investments in RDE can be appraised thoroughly to ensure that RDE activities are geared toward addressing the needs and problems of the clientele of the university in its service area, in particular, and in the national level in general, for sustained agricultural development and its allied fields. Expectedly, very active interactions will form part of the highlights.

OBJECTIVES

1. To evaluate completed and on-going RDE projects/activities particularly with regard to the attainment of objectives and adherence to the approved programs;

2. To identify problems met during the implementation and recommend specific courses of action, i.e. continuation, extension, modification of planned activities and methodology, suspension, termination, etc., in compliance with the recommendations of the evaluating panel;

3. To identify technologies generated for field testing, verification, and piloting before its final dissemination/promotion and commercialization;

4. To identify mature technologies ready for packaging and dissemination;

5. To identify significant results for policy formulation and development;

6. To identify new researchable areas; and

7. To record and monitor both in-house and externally funded researches.

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No. 63(64)572-2138

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OFFICE OF THE PRESIDENT

Message

My warmest greetings to the presenters, researchers, evaluators, guests, and organizers of our University's Research, Development and Extension's 40th In-house Review with the theme, *USM RDE: Fostering Activities for Building Adaptive Communities.* In trying times like these, we need each other's research expertise to discuss ways and means for us to be of help and contribute in uplifting lives of the people in our communities most especially those affected by the COVID-19 pandemic.

May the researches that we have conducted and will be conducting further inspire and give hope especially to the ones needing it the most. May our extension activities be their source of knowledge and skills to better cope with the challenges brought by this pandemic crisis.

May God continuously give us the strength, wisdom and inspiration to investigate and study the needs of our target end users and bless our Research, Development and Extension endeavors.

FRANCISCO GIL N. GARCIA, PhD
SUC President IV

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No. 63(64)572-2138

OFFICE OF THE VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

Message

COVID-19 pandemic crisis has brought enormous challenges in various aspects of life including the implementation of research, development and extension (RDE) projects. While some people stagnate due to this crisis, some make ways to adjust, develop and provide alternative interventions to pursue the implementation of RDE endeavors to generate the expected or modified deliverables. Overcoming these challenges involve willingness, determination, positive attitude, creativity and proactive and positive actions to achieve the desired goals and objectives. We commend, thank and congratulate all faculty and researchers who exert extra efforts in various ways and means to produce outputs from their funded research projects despite these challenges. For those who partly did and completely did not, this provides a lesson, inspiration and stepping stone to make more efforts, be good steward of time, resources and opportunities and exercise the power of positive thinking, creativity, attitude and actions that result to productivity and efficiency- a good opportunity of giving the best next time around. Still, we acknowledge and appreciate the efforts and pursuit.

This In-House Review provides opportunities to showcase RDE outputs, assess progress of research implementation and select possible entries for regional and national competitions. We congratulate and wholeheartedly thank the organizers- PICRI and USMARC Directors and staff, different RDE unit Heads and staff, whole RDE family, various Committee Heads and members, distinguished evaluators and USM administration for a successful 40th USM In-House Review.

EDWARD A. BARLAAN, Ph.D.

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No. 63(64)572-2138

OIC DIRECTOR FOR RESEARCH AND DEVELOPMENT OFFICE

Message

The USM Research, Development and Extension (RDE) in-house review is an annual activity of the University where outputs of RDE programs, projects, and studies are evaluated, disseminated and recognized. Through this we could assess the quality and impact of our RDE undertakings for the community, industry and stakeholders.

Holding the in-house review even during these challenging times demonstrated the strong commitment of our Institution to carry-out RDE engagements. RDE plays an important role in building adaptive communities. Our research themes are access to education and literacy, promotion of peace, gender equality and development, preservation of arts, culture, language and literature, environmental protection and conservation, food security and poverty alleviation, halal, health care and proper nutrition, and engineering and technology. Working with and for the community with our interdisciplinary expertise and research innovations could address social and economic issues of our clientele and improve quality of life.

We appreciate all the researchers and extension workers in our University for their endeavors, and the working committees of the 40th in-house review. We wish the presenters all the best and the evaluators for their support in this year's in-house scientific meeting.

Cabasan

MA. TEODORA N. CABASAN

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No. 63(64)572-2138

OFFICE OF THE DIRECTOR FOR EXTENSION SERVICES

Message

Shalom to everyone!

The theme "USM RDE: Fostering activities for building adaptive communities" is reflective of the continuous effort of the university to be of great service in the field of research development and extension in this challenging time, the COVID-19 pandemic. The in-house review is an avenue to convene and share outputs and outcomes of our meaningful and relevant RDE activities among faculty members, researchers, staff and administrators.

To our innovators and generators of knowledge and our faculty extension implementers, may our RDE initiatives and activities will lead to resilient and adaptive communities. In these critical times, our university is mindful of affording relentless efforts in attaining sustainable development goals, thus enhancing the quality of life.

To the 40th RDE In-House Review Committee, congratulations for leading and making this endeavor a successful one.

To God/Allah be the highest glory and honor.

ARDNIEL A. BALADJAY, Ph.D.

Republic of the Philippines
UNIVERSITY OF SOUTHERN MINDANAO
Kabacan, Cotabato
Tel. No. 63(64)572-2138

OFFICE OF THE DIRECTOR FOR PHILIPPINE INDUSTRIAL CROPS RESEARCH INSTITUTE (PICRI)

Message

The University of Southern Mindanao 40th Agency In-House Review with the theme **"USM-RDE: Fostering Activities for Building Adaptive Communities"** aims to provide a venue and platform for the scientific community and professionals in different fields of agricultural and social sciences to interact and present their recent researches relevant to advancing Philippine agriculture and sustainable development.

This event is particularly important as our University is at the crossroads of various challenges made even more complex by the pandemic covid-19. This endeavor will also serve as avenue for dissemination of R, D & E results and outputs in the Region.

On behalf of the Philippine Industrial Crops Research Institute (PICRI), as the over-all coordinator of this year's In-house Review, I would like to extend my deepest appreciation to all working committee chairs and members, faculty, staff, and administration for the concerted efforts that made this event possible.

May this In-House Review serve as a fertile ground for sharing your talents and research outputs/updates. I wish everyone an insightful, productive, and inspiring participation.

SAMSUDIN S. PANDAY
Director, Philippine Industrial Crops Research Institute
Over-all Coordinator, 40th Agency In-House Review

GENERAL SCHEDULE OF ACTIVITIES

DAY 1: October 21, 2020 (Wednesday)

TIME	ACTIVITY
8:00 AM – 8:30 AM	Registration
8:30 AM – 9:00 AM	Opening Program
9:30 AM – 12:00 NN	Presentation of RDE Projects
12:00 NN – 1:00 PM	*Lunch Break*
1:00 PM – 4:00 PM	Presentation of RDE Projects

DAY 2: October 22, 2020 (Thursday)

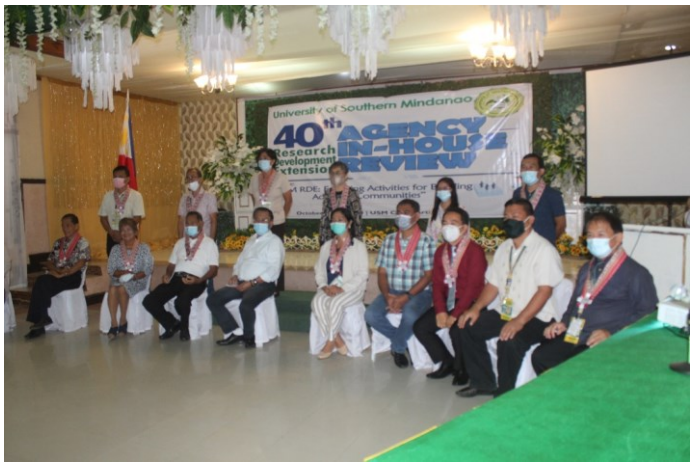
TIME	ACTIVITY
8:30 AM – 11:00 AM	Presentation of RDE Projects
11:00 AM – 12:00 PM	Poster Viewing
12:00 PM- 1:00 PM	*Lunch*
01:00 PM – 02:00 PM	Validation/Synthesis of Reports
02:00 PM - 3:00 PM	Closing Program

OPENING PROGRAM

Café Martina, USM Kabacan, Cotabato
October 21, 2020
8:30 AM

Invocation	**Engr. Kharlo J. Subrio** SRS II
National Anthem	**Ms. Arlene Riogelon** Faculty, CA
Welcome Remarks	**Dr. Edward A. Barlaan** VP for RD & E
Opening Message	**Dr. Francisco Gil N. Garcia** SUC President IV
Rationale	**Dr. Samsudin S. Panday** Director , PICRI Over-all Coordinator, 40th IHR
Presentation of Evaluators, Moderators, and Participants	**Dr. Efren E. Magulama** Director , USMARC Co-Coordinator, 40th IHR

EMCEE : **Prof. Joeseph S. Quisado**
Faculty, CA



PANEL OF EVALUATORS

Session 1 – RESEARCH

Dr. Ariston D. Calvo
Dr. Pernelyn S. Torreña

Session 2 - DEVELOPMENT

Dr. Elpidio Mar R. Bautista
Mr. Ruel Villanueva

Session 3 - SOCIAL SCIENCE and EXTENSION

Dr. Marcelina O. Bahalla
Mr. Omal Abdulkadil
Mr. Rodelio Ambangan

MODERATORS

Session I (Mangosteen Hall, Café Martina)

Paul John B. Ongcoy
Marlyn A. Resurreccion
Lorelyn Joy N. Turnos
Mark Al-jamie J. Muttulani

Session II (Lanzones Hall, Café Martina)

Girlie E. Ticbe
Helen A. Macailing
Maria Luz D. Calibayan
Nelia O. Du

Session III (Extension Conference Room)

Kathleen Ivy Z. Bolotaolo
Joseph O. Castillo
Stephen Dave M. Dupo
Ana Rose E. Cunanan

SCHEDULE OF PRESENTATION

DAY 1 (October 21, 2020 – Wednesday)

	Start	End	Research	Development	Social Science
1	9:40	9:50	USM Corn R&D Program: Harnessing Potential of Non-Conventional Hybrids and Other Special Types in Improving Corn Productivity/*Efren E. Magulama, Nenita E. Olero, and Antonio P. Pasig*	Utilization of Electronics Waste Management Model: The intervention in the case of Higher Education Institutions of North Cotabato/*Maricel G. Dayaday and Fredelino A. Galleto Jr*	Willingness to Accept (WTA) Compensation among Respondents and the Valuation of the Provisioning Function of the Agricultural Land in the Inundated Areas of the Proposed Kabulnan-2 Multi-Purpose Irrigation And Power Project (K2MIPP) In Sultan Kudarat/ *Norma U. Gomez, Rhenalie Bello, Alaiza Hadji Ali, and Paulene Grace Favila*
2	9:50	10:00	Screening of Corn Varieties Against Corn Diseases /*Jasmin A. Pecho*	Product Development, Packaging and branding of Smokes Native Catfish (*Clarias macrocephalus*) as "TINAHITO"/ *Pia Amabelle M. Flores and Jalaloden Marohom*	Factors Affecting the Willingness of the Respondents to be Relocated: the Case of the Proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project (K2MIPP) in Sultan Kudarat/ *Norma U. Gomez, Rhenalie Bello, Alaiza Hadji Ali, and Paulene Grace Favila*
3	10:00	10:10	Enhancing Productivity of *Lansium domesticum* Corr. (Longkong) Through the Interactive Effects of Fertilization, Plant Growth Regulator (PGR), Irrigation and Flower/Fruit Thinning Techniques /*Nenita E. Olero, Antonio P. Pasig*	Agro-Eco Farm Tourism Development for Livestock and Poultry in the University of Southern Mindanao/*Julius Jerome G. Ele, Roy C. Ricabar, Mary Joy S. Caňolas, Geoffrey R. Atok, Vic Laurence P. Oliva, Josephine R. Migalbin, Jurhamid C. Imlan, and , Eulalio Jr M. Vergara*	Baseline Study for the Proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project (K2MIPP) in Sultan Kudarat/*Norma U. Gomez, Rhenalie Bello, Alaiza Hadji Ali, and Paulene Grace Favila*
4	10:10	10:20	Determining the Differential Growth and Yield Performance of Black Pepper Attributed to the Type of Trellis and Planting Materials /*Sheena B. Lucena & Nancy E. Duque*	Revitalizing the Intellectual Property and Technology Business Management (IP-TBM) Operations in the University of Southern Mindanao (USM)/*Pia Amabelle M. Flores, CyrelleM. Besana, Jalaloden B. Marohom & Mark Henry De Leon*	USM IP Profile: Learning Styles and Knowledge Transmission/ Dyane Rhea B. Bana-ay

5	10:20	10:30	Evaluation of the Larvicidal Activity of *Aedes aegypti* and *Anopheles* sp. Using Marigold (*Tagetes Erecta*)/ *Sedra A. Murray & Elma G. Sepelagio*	Market Analysis and Positioning of Processed Halal Chevon Food Products/ *Jalaloden Marohom, Lorna Valdez & Ivy Mar Cabornida*	USM IP Profile: Tracer Study on USM IP Research Studies/ John P. Baylon
	10:30	10:50	OPEN FORUM		
	Start	**End**	**Research**	**Development**	**Social Science**
6	10:50	11:00	Nanofertilization to Enhance Production of High-Value Vegetables and Legumes/ *Nancy E. Duque*	Agri-Farm Tourism Development for Herbs and Spice and Medicinal Plants/ *Rhodora Manceras & Ivy M. Pasquin*	USM Indigenous Peoples Profile: Input to USM Education Design/ Radji Macatabon
7	11:00	11:10	Meliponiculture: Trapping Of Stingless Bees Using Three Different Trap Hives/ *Francisco Gil N. Garcia & Josephine R. Migalbin*	Establishment of Geographic Information Support System Center for High Value Commodities and Indigenous Crops On SOCCSKSARGEN/ *Adeflor G. Garcia & Purificacion O. Cahatian*	Study 1: Predictors of Success and failures of Test Takers in the Licensure Examination for Chemist: Basis for the Development and Assessment of Intervention Programs in Improving Passing Rate/*Ronel A. Naringahon*
8	11:10	11:20	Rehabilitation of High Value Crop Commodities for Research and Production/ *Edward A. Barlaan and Sheena B. Lucena*	Land Management of Rubber- Based Systems in Southern Philippines Proj 2. Land Suitability Analysis for Rubber Crops in Agusan del Sur *Component:* Limitations and Constraints For Production of Rubber (*Hevea brasiliensis*) Using Geographic Information Systems (GIS) In Agusan Del Sur, Philippines/ *Adeflor G. Garcia1, Kim I. Gonzales, Richie P. Lador, Nepthali F. Morgado*	Study 2: Predictors of Success and failures of Tests takers in the Licensure Examination for Agriculturist : Basis for the Development and Assessment of Intervention Programs in Improving Passing Rate/*Donnie M. Tulud*
9	11:20	11:30	Development and Product Evaluation of Adlai Butter Spread and Sayote Leaf Tea/ *Emilie S. Estelloso, Jenny B. Mamacus, Janice E. Reynes, April Geraldin M. Quenonero & Jo-Ann D. Santos*	Upgrading of Geographic Information Center R&D Facilities at the University of Southern Mindanao/ *Francisco Gil N. Garcia, Adeflor G. Garcia, Purificacion O. Cahatian, and Rezin G. Cabantug*	Study 3: Predictors of success and failure of test takers in the licensure examination for Agricultural and Biosystems Engineering: Basis for the Development and Assessment of Intervention Programs in Improving Passing Rate/*Mirasol O. Verona*
10	11:30	11:40	Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables/ *Naomi G.*	Marketing Potential and Product Acceptability of UF18 Cacao Variety/ *Cheryl Y. Dulay, Ivy Mar B. Cabornida & Jigzcel*	Assessment on the Alignment of USM Student and Faculty Researches Based on University Research Themes/ *Francisco Gil N. Garcia & Paul John B. Ongcoy*

			Tangonan, Purificacion O. Cahatian & Maria Irinea S. Candolita	*Divine F. Basoy*	
	11:40	12:00	OPEN FORUM		
	12:00	**1:00**	**LUNCH BREAK**		
	Start	**End**	**Research**	**Development**	**Social Science**
11	1:00	1:10	Molecular Identification and Detection of Microbial Pathogens of Banana/ *Edward A. Barlaan*	Upgrading of Geographic Information Center at the University of Southern Mindanao Kabacan, Cotabato/ *Francisco Gil N. Garcia, Adeflor G. Garcia & Rezin G. Cabantug*	Proj. Development and Validation of Teaching Guide in Earth Science Using 7E's Lesson Approach and Lesson Study Model/ *Hazel Ann S. Soriano, Faith P. Buned, Jay G. Regulacion & Kautin S. Kulano* Comp. 1. Benchmarking of Teachers' Awareness, Development and Validation of Teaching Guide in Geology Using 7E's Lesson Approach and Lesson Study Model/*Hazel Ann S. Soriano*
12	1:10	1:20	Phenotypic and Genotypic Analysis of *Coffea canephora* (Robusta) using Morphological and molecular markers/ *Emma K. Sales & Harem R. Roca*	Curriculum Development and Offering on Halal Science and Scholarship for SUC Faculty on Halal Science/ *Emma K. Sales, Francisco Gil N. Garcia, Josephine R. Migalbin & Monaira I. Sumael*	Comp 2. Benchmarking of Teachers' Awareness, Development and Validation of Teaching Guide in Meteorology Using 7E's Lesson Approach and Lesson Study Model/*Faith P. Buned*
13	1:20	1:30	Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genome-wide Association Studies (GWAS)*/ Edward A. Barlaan & Emma K. Sales*	Teaching and Learning Enhancement on Selected General Education (GE) Courses Through Outcomes-based Education (OBE)/ *Abubakar A. Murray & Kharlo J. Subrio*	Comp 3. Benchmarking of Teachers' Awareness, Development and Validation of Teaching Guide in Oceanology Using 7E's Lesson Approach and Lesson Study Model/*Jay G. Regulacion*
14	1:30	1:40	Improvement of Carabao Mango Fruit Quality through Development Molecular Markers for Scab and Stem-end Rot Resistance by Genome-wide Association Studies (GWAS)/ *Emma K. Sales and Edward A. Barlaan*	Design, Fabrication and Evaluation of Dehumidifier Air Dryer/ *Alven G. Delson*	Comp 4. Benchmarking of Teachers' Awareness, Development and Validation of Teaching Guide in Astronomy Using 7E's Lesson Approach and Lesson Study Model/*Kautin S. Kulano*

15	1:40	1:50	Pilot Testing and validation of SSR Marker Kit for Philippine Mango Germplasm in Commercial Mango Nurseries/ *Emma K. Sales & Marry Grace N. Balbuena*	Land Use Plan of USMARC and PICRI: Inputs to Land Use Development and Infrastructure Plan (LUDIP) of the University/*Rezin G. Cabantug, Tito Jun T. Tidula, Chresil Sales, Edward A. Barlaan, Samsudin S. Panday, and Efren E. Magulama*	Instructional Material Development: Input to GE Course on Peace and Development/ A*mme Rose L. Blonto & Radji A. Macatabon*
	1:50	2:10	OPEN FORUM (20 minutes)		
	Start	**End**	**Research**	**Development**	**Social Science**
16	2:10	2:20	Land Suitability Analysis for Rubber (*Hevea brasiliensis*) Using Analytical Hierarchy Process (AHP) and Geographic Information Systems (GIS) in Agusan Del Sur, Philippines/*AG Garcia, KI Gonzales, RP Lador, and NF Morgado*	Upgrading of Crop Processing Center at University of Southern Mindanao/*Francisco Gil N. Garcia and Harem R. Roca*	Panitikang Bayan ng mga Katutubo Bilang Kagamitang Pampagtuturo/ *Maria Luz D. Calibayan, Shandra C. Gonzang, & Nelia O. Du* Comp 1. Panitikang Bayan nga mga Maguindanao Bilang Kagamitang Pagpagtuturo/*Shandra C. Gonsang*
17	2:20	2:30	Land Management of Rubber- Based Systems in Southern Philippines Proj 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation/*AG Garcia & Mel Chrisel Sales*	Enhancing Organic Vegetable Production for Farm Tourism/*Purificacion O. Cahatian and Adeflor G. Garcia*	Comp 2. Panitikang Bayan ng mga manobo Bilang Kagamitang Pampagtuturo/*Nelia O. Du*
18	2:30	2:40	Land Management of Rubber- Based Systems in Southern Philippines Proj 4. Pest and Disease Management for Rubber and Intercrops/ *PO Cahatian*	Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines (SARAI)-Phase III/ *Adeflor G. Garcia, Moises A. Doradon, Purificacion O. Cahatian, Romulo L. Cena, Maria Victoria R. Espaldon, Felino P. Lansigan*	Comp 3. Panitikang Bayan ng mga Teduray Bilang Kagamitang Pampagtuturo/*Maria Luz D. Calibayan*
19	2:40	2:50	Land Management of Rubber- Based Systems in Southern Philippines Proj 6. Capacity Building of Rubber Stakeholders And Role of Women & Children in National Rubber Industry In Agusan/*Mary Rodelyn Cariaga*	Germplasm Collection, Preservation and Perpetuation of Philippine Indigenous Plants with Food and Medicinal Values/ *Rezin Cabantug*	Concretization of GAD Initiatives in USM/ *Jacinta T. Pueyo & Marlyn Resurreccion*
20	2:50	3:00	Multilocation Trial of Ten (10) Promising Varieties of cacao in Type II and III Agro-Climatic Zones in Southern and Northern Mindanao/ *Chris Harvin Rey Calvo & Sheena B. Lucena*		

21	3:10	3:20	Potential Anti-cancer Leads from Plants in Region XII: Screening of Plants from region XII with Potential Anti -Cancer Activity /*Lydia C. Pascual, Francisco Gil N. Garcia, Loveille Jun A. Gonzaga & Harem R. Roca*		
22	3:20	3:30	Mineral Nutrition of Rubber and Rubber-Based Cropping in Southeast Asia/*Mel Chrisel A. Sales*		
	3:30	3:50	OPEN FORUM		

Day 2 (October 22, 2020 – Thursday)

	Start	End	Research	Extension - A	Extension - B
21	8:30	8:40		Save Ligawasan Marsh: A Climate Change Mitigation Initiative Through Efficient Utilization Of Alternative Energy/ *Saque J. Amilbahar, Tito Jun T. Tidula, and Cayetano C. Pomares*[3]	HEALS (Health, Environment, Agricultural and Livelihood Skills) for Sustainable Development *Analyn Gonzales, Moreno B. Java, Jr., Faith P. Buned, Glyn B. Gabano-Magbanua, Jerose L. Molina, Maribelle T. Piamonte, Hasim K. Iskak, Elizabeth C. Molina, Monaira I. Sumael, Sedra A. Murray, Joel V. Misanes and Elizabeth R. Genotiva*
2	8:10	8:20		Fish and Meat Processing in Barangay Cuyapon, Kabacan, North Cotabato/*Cyra Mae R. Escalera and Milagrina P. Pomares*	Integrated Video and Audio Services for Enhanced Education: A connectivity Resilience Projects Amidst COVID-19 Pandemic/*Janice M. Bangoy, Ardniel A. Baladjay, Genghis Khan P. Manero, Allan G. Dalo, Juvelyn Gesulga, Myrna R. Tan*
23	8:20	8:30		SOXAARRDEC: Kaagapay Ng Magsasaka Sa Krisis At Kalamidad (KMKK)/ *Elizabeth C. Molina, Ardniel A. Baladjay, Analyn V. Deriquito, Siony Bruño and George Cadungon*	Fat to Fit Through Sports And Fitness Program For USM Faculty And Staff: (Fellowship And Teamwork To Fitness In Training For USM Faculty And Staff) *Judy L. Garcia, and Moreno B. Java Jr., Vinus P. Java, Eduard S. Sumera, Jessa S. Buisan, and Ruben L. Tagare*

24	8:30	8:40		Utilization Assessment on Modified Solar Photovoltaic Lighting System in IP Communities/ *Jowena G. Belocura & Jimmy D. Rama*	FAT to FIT Through Sports And Fitness Program For USM Faculty And Staff: (Fellowship And Teamwork To Fitness In Training For USM Faculty And Staff): Fat to Fit through Sports Training Program *Judy L. Garcia, Elpedio A. Arias, Marlene E. Orfrecio, Gladys Pearl Ambrosio, Jomar B. Esto, Malony F. Martinez, Marlon A. Mancera, Jerum B. Elumbaring, Helen Grace D. Lopez, Priscilla P. Dagoc, Norge D. Martinez, Desireee Tenebroso, Marichu C. Calixtro, Jomar Esto, Queenie Tobiano, Cheeze R. Janito*
25	8:40	8:50		Going Bananas- Restoring Livelihoods of Conflict Affected Farmers in Cotabato/ *Francisco Gil N. Garcia, Adeflor G. Garcia, Purificacion O. Cahatian, Harem R. Roca & Willie Jones B. Saliling*	Collaborative Barangay-Based Development and Economic Mainstreaming/*Analyn A. Gonzales*
	8:50	9:10	OPEN FORUM (20 minutes)		
26	9:10	9:20			Kabataan Kontra Droga at Terorismo: Kasama, Kalinga, Kasangga (Kkdat: Kkk): Utilizing Infographic Materials As Tool To Assist Filipino Youths For Prevention Against Terrorism and Illegal Drugs/*Ruben L. Tagare, Jr., Cheeze Janito, Marichu Calixtro and Jomar B. Esto*
27	9:20	9:30			Kabataan Kontra Droga at Terorismo (KKDATT:KKK): Kasama, Kalinga, Kasangga (KKDAT-Sports as an Avenue/*Norge D. Martinez, Malony F. Martinez, Priscilla P. Dagoc, Jerum B. Elumbaring, and Elpedio A. Arias*
	9:30	9:40			Kabataan Kontra Droga at Terorismo: Kasama, Kalinga, Kasangga (KKDAT: KKK): Ways to succeed: Organizing for KKDAT activities/ Judy L. Garcia, Marlene Orfrecio, Marlon A. Mancera, and Jessa S. Buisan
	9:50	10:10	OPEN FORUM (20 minutes)		

ABSTRACTS

Basic Category

LAND SUITABILITY ANALYSIS FOR RUBBER (*Hevea brasiliensis*) USING ANALYTICAL HIERARCHY PROCESS (AHP) AND GEOGRAPHIC INFORMATION SYSTEMS (GIS) IN AGUSAN DEL SUR, PHILIPPINES

(A component study of the ACIAR Funded Project 2 "Land Suitability Analysis for Rubber in Agusan del Sur").

Adeflor G. Garcia, Kim I. Gonzales, Richie P. Lador, Nepthali F. Morgado

A study was conducted to determine the suitability of rubber for production in the province of Agusan del Sur and to integrate GIS technology in creating a suitability map. The suitability analysis was based on land characteristics that are relevant to the growth and development of rubber. The characteristics were then categorized into main and sub criteria and weights have been determined accordingly.

In determining the criteria weights and the overall suitability classification, Analytical Hierarchy Process (AHP) with pairwise comparison method was used. The criteria were categorized into main and sub criteria; weights were then determined using a pairwise comparison matrix where all criteria were compared and scored based on relative importance to each other. After weighing, the consistency ratio was then calculated and results show consistency among all factors. The main criteria (climate, topography, and soil physical characteristics) had a consistency ratio calculated at 0.0224; for the sub-criteria of soil physical characteristics (soil depth, texture, and drainage), the consistence ratio was 0.0937; and for the sub criteria of soil chemical characteristics (pH, CEC, organic matter, and base saturation), the consistency ratio was 0.0451, all of which fall below 0.10 as required in the AHP method.

The soil series identified as highly suitable for rubber production were: Butuan series, Mambutay series, San Manuel series, Quingua series, Lourdes series, and Bolinao series. The soil series identified as moderately suitable were: Dolongan Series, Mambutay Series, Cabangan Series, Camansa series, Kidapawan series, Malalag series, Faraon series, and Madunga series with significant limitations of excess rainfall, shallow soil depth, poor soil drainage and steep slopes.

Overall results of the study indicate that rubber production in Agusan del Sur is very viable and has high potential to be developed as a major industry in the country.

Keywords: Suitability, Rubber, GIS, Agusan del Sur, Limitations and Constraints, AHP

HARNESSING POTENTIAL OF NON-CONVENTIONAL HYBRIDS AND OTHER SPECIAL TYPES IN IMPROVING CORN PRODUCTIVITY

Efren E.Magulama[1], Nenita E Olero[2], Antonio P. Pasig[2] and Joanne E Duran[3]

[1]Project Leader, [2]Study Leader and [3]Research Assistant

The project aimed to develop high yielding maize hybrids and special types and submit potential yield entries to NCT-NSIC for possible commercial release. A total of 140 yellow and 11 white S_1 lines were generated from various sources. There were 208 half-sib families generated derived

from IES Glut #7 and 180 half-sib families derived from Lagkitan. Thirteen experimental hybrids were formed and are currently evaluated for yield and other agronomic traits. For NCT, of the 42 entries evaluated in dry season trial, five entries out yielded (7.30-9.27 t/ha) the check variety (6.97 t/ha) in set A and out seven entries, one entry (6.90 t/ha) outyielded the check variety (6.54 t/ha) in set B. A total of 43 entries are currently evaluated for yield for wet season trial in NCT. Further, USM varieties (USM Var 10 and 5) are currently under seed maintenance using modified ear to row selection. Parent lines for yellow hybrids were seed increased through controlled pollination.

Keywords: harnessing, potential, non-conventional, special types

SCREENING OF CORN VARIETIES AGAINST CORN DISEASES

Jasmin A. Pecho

A study was conducted to develop the resistance corn varieties at USMARC. Specifically, it aimed to identify inbred lines resistant to diseases, develop an open pollinated varieties resistant to diseases, and develop IEC materials on diseases of corn. Prior to plant the test entries, agricultural practices were applied such as land preparation, basal application during planting as well as fertilizer application at 40 DAP to ensure the entries were properly cared. On the other hand, isolation of the causal pathogen like Fusarium causing ear rot was done in the laboratory, mass production of the causal fungus was also done and waited until the entries ready for the inoculation. Data were gathered such as disease severity and disease infection of ear rot at harvest were done. Out of 6 entries, two (2) entries were rated as resistant with the disease severity of 7.55 and 8.57, respectively, another two (2) moderately resistant and moderately susceptible. Further, banded leaf and sheath blight caused by *Rhizoctonia solani* were also noted.

Keywords: ear rot, *Fusarium*, corn, open pollinated varieties

ENHANCING PRODUCTIVITY OF *Lansium domesticum* CORR. (LONGKONG) THROUGH THE INTERACTIVE EFFECTS OF FERTILIZATION, PLANT GROWTH REGULATOR (PGR), IRRIGATION AND FLOWER/FRUIT THINNING TECHNIQUES

Nenita E. Olero, Antonio P. Pasig, and Ferdinand A. Duldulao

The research project aimed to determine the yield potential of Longkong as affected by NPK and GA_3 application, irrigation and flower/fruit thinning techniques. The experiment is now being conducted at the University of Southern Mindanao Agricultural Research Center, USM, Kabacan, Cotabato. Four fertilizer levels and two GA3 rates were applied on 9-year old Longkong trees. Off-season production of Longkong through watering at two, three, and four weeks dry spell followed by five days watering and flower/fruit thinning techniques were also evaluated. Application of 9-kilogram 14-14-14/tree per year increased the yield of 9-year old Longkong. Watering for five days after four weeks long dry spell produced higher yield off-season fruits on 12-year old Longkong. Trees thinned out of 30% of their fruits produced higher yield, bigger fruits and higher percentage marketable fruits.

Keywords: Longkong, interactive effects, irrigation, fruit thinning, off-season

DETERMINING THE DIFFERENTIAL GROWTH AND YIELD PERFORMANCE OF BLACK PEPPER ATTRIBUTED TO THE TYPE OF TRELLIS AND PLANTING MATERIALS

Sheena B. Lucena[1] and Nancy E. Duque[2]

[1]Educational Program Specialist I and Project Leader, Philippine Industrial Crops Research Institute and [2]Senior Science Research

Two studies were carried out at the University of Southern Mindanao Agricultural Research Center, USM, Kabacan, Cotabato to determine the nursery production and survival of black pepper using different types of planting materials, evaluate the growth and yield performance of two varieties of black pepper planted under different trellises and compare the performance of two varieties of black pepper using propagated runners and lateral shoots. Percentage survival of black pepper cuttings grown under modified vacuum and open condition did not significantly vary. However, significant interaction between the portion of runner shoots and number of nodes were noted at 15, 30 and 45 days after planting but none at 60 days. Blackpepper cuttings using the lower and middle 1/3 portion and with two or three unrooted nodes had significantly higher percentage survival than those from upper portion. However, no significant differences were noted among the three portions when single nodal cuttings were used. Percentage survival at 60 days was significantly higher in black pepper grown from the lower and middle portions than that from the upper part. Similarly, higher percentage survival was achieved from rooted single nodal cuttings than those with three nodes. Meanwhile, plant height, length of spikes and number of berries per spike of field grown black pepper significantly differed between the two varieties, Hainan and native. These parameters however were not significantly affected by the type of trellis nor by the variety and trellis interaction. The number of flowers per plant did not significantly differ between the two varieties but significantly varied among the type of trellis. Moreover, the number of plants that produced flower and number of spikes per plant were not significantly different between the two varieties, type of trellis and variety x trellis interaction.

NANOFERTILIZATION TO ENHANCE PRODUCTION OF HIGH-VALUE VEGETABLES AND LEGUMES

Nancy E. Duque
Senior Science Research Specialist
University of Southern Mindanao, Kabacan, Cotabato

Fertilizers play an important role in enhancing food production and quality particularly with the introduction of improved, high-yielding and fertilizer responsive varieties. Nanofertilizers have been developed through nanotechnology to increase nutrient efficiency and improve plant nutrition compared with traditional fertilizers. Two studies were conducted at the University of Southern Mindanao Agricultural Research Center (USMARC), USM, Kabacan, Cotabato to determine the growth and productivity of loose leaf lettuce and mungbean applied with nanofertilizers and identify the most responsive variety to nanofertilization. In lettuce, the study was carried out in randomized complete block design with six fertilizer treatments while in mungbean, the study was laid out in split design with 3 varieties as mainplot and nine fertilizer treatments as subplot. Yield, height and leaf parameters of loose leaf lettuce were significantly increased by nanofertilizer application. Lettuce applied with nanofertilizers were taller, produced more leaves with longer and bigger leaf size, and bigger stem diameter than those without fertilizer. Yield was significantly higher in lettuce applied with nanofertilizer NF2 than those with NF1, organic fertilizers OF1 and OF2 and conventional fertilizer (urea). NF1 provided yield comparable to that with organic and conventional fertilizers but significantly higher than that of the unfertilized plants. On the other hand, height, number of pods and number of seeds per pods of mungbean was not significantly influenced by the main effects nor by the interaction of variety and fertilizer. However, bean yield was significantly influenced by the interaction of these two factors. Comparison of varieties showed that NSIC Mg13 yielded significantly higher than NSIC Mg17 and NSIC Mg22 when applied with nanofertilizer NF1 and organic fertilizer OF3. However, these three varieties did not significantly vary in yield when applied with NF2, organic fertilizers (OF1, OF2, OF4, OF5) and conventional fertilizer (urea). Moreover, comparison of fertilizer

treatments showed no significant variation in yield of NSIC Mg22 indicating this variety is not responsive to fertilizer application. In contrast, yield significantly varied for NSIC MG13 and NSIC Mg17. Among the fertilizers applied in NSIC Mg13, NF1 provided the highest yield comparable to NF2 and OF3 but significantly higher than those applied with conventional fertilizer. In NSIC Mg17, yield of plants applied with nanofertilizers NF1 and NF2 were comparable to those applied with different organic fertilizers and to that with conventional fertilizer.

Keywords: *nanofertilizer, organic fertilizer, conventional fertilizer, variety, yield*

MELIPONICULTURE: TRAPPING OF STINGLESS BEES USING THREE DIFFERENT TRAP HIVES

Francisco Gil N. Garcia, PhD. and Josephine R. Migalbin, PhD.

The study aimed to assess the effectiveness of bamboo internode, coconut shell, plastic bottle as trap hives, description of nesting sites and food source of stingless bees. It was carried out at University of Southern Mindanao - Main and Kidapawan City Campuses, each having an area of 1,024 and 14.97 hectares, respectively. Alongside, nesting sites were surveyed on July to September 2020, for a total of 400 – observation hours.

Sixty-seven nests were found in which 20 were in building crevices, 15 on tree stem/branch, 14 in dead logs, nine (9) in underground cavities and nine (9) in PVC pipes. Analysis of variance revealed a significant difference among the treatments of bamboo internode compared to coconut shell and plastic bottle.

The geographical location (latitude and longitude) of stingless bees found in USM main range from 7degrees, 6 minutes, 34.04 seconds North (7°6’34.04”N) to 7 degrees, 7 minutes, 19.55 seconds North (7°7’19.55”N) and 124 degrees, 49 minutes, 39.03 seconds East (124°49’39.03”E) to 124 degrees, 50 minutes, 38.71 seconds East (124°50’38.71”E) while USM-KCC range from 7 degrees, 1 minute, 48.67 seconds North (7°1’8.67”N) to 7 degrees, 1 minute, 55.64 seconds North (7°1’55.64”N) and 125 degrees, 6 minutes, 45.07 seconds East (125°6’45.07”E) to 125 degrees, 6 minutes, 352.28 seconds East (125°6’52.28”E), respectively. Moreover, there were fifty–eight (58) flowering plants identified around the colonies under different plant families.

Keywords: stingless bee, trap hives, location, flower

IMPROVEMENT OF ‘CARABAO’ MANGO FRUIT QUALITY AND PRODUCTION THROUGH DEVELOPMENT OF MOLECULAR MARKERS FOR SCAB AND STEM-END ROT RESISTANCE BY GENOME WIDE ASSOCIATION STUDIES (GWAS)

Emma K. Sales

The study was conducted to generate molecular markers associated with scab and stem-end rot resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utilization in marker-assisted breeding in ‘Carabao’ mango. Fifty three (53) mango varieties (22 Carabao varieties and 31 other varieties) were characterized and were inoculated with causal pathogen of stem-end rot disease and assessed based on its degree of infection. Percent susceptibility of the evaluated varieties ranges from 21.01% to 100%. Among the 53 varieties, 2 varieties were resistant, 4 varieties were moderately resistant, 11 varieties were susceptible, 11 varieties were moderately susceptible and 25 varieties were highly susceptible. Most of the Carabao mango varieties evaluated (68.18%) were highly susceptible to stem end rot disease.

On the other hand, isolation and inoculation of causal pathogen of scab disease, and evaluation

of mango varieties for resistance to scab disease is still on the process of optimization. Development and design of molecular markers was done as another option to detect *Elsinoe mangiferae* in soil and leaf samples. Two molecular markers (forward and reverse) to detect *Elsinoe mangiferae* (causal pathogen of scab disease) was designed and developed through multiple alignment analysis of *Elsinoe mangiferae* DNAs available on published literatures. These markers will be validated using subcultures isolated from leaf samples and soil samples affected by scab disease.

In situ inoculation was done as an alternative option for evaluation of resistance against scab disease. Forty-two (42) mango varieties (21 Carabao varieties and 21 other varieties) were grafted to be used as samples for the *in situ* evaluation of resistance against scab disease.

PILOT TESTING AND VALIDATION OF SSR MARKER KIT FOR PHILIPPINE MANGO GERMPLASM IN COMMERCIAL MANGO NURSERIES

Emma K. Sales, Marry Grace S. Balbuena and Avigel I. Cabrillos

The Philippine ranks number 6 among the mango producers in the world with combined exports of fresh, dried and processed mangoes. Among the different cultivars grown in the country, 'Carabao' or Manila Super mango is the prime export variety due to its perfect blend of sweetness and sourness and its luscious aroma. Of this popular cultivar, there are 3 known strains namely "Lamao" of Central Luzon, "Carabao Gold" of MMSU, "Sweet Elena" of Zambales and Guimaras. However, many other varieties are also being cultivated and there is a strong suspicion of mislabeling in some commercial nurseries. Therefore, there is an urgent need to address such problem. The cultivars commercially propagated need to be accurately identified and certified true-to-type to avoid jeopardizing the integrity of the nursery where they emanated. A previous completed PCAARRD funded project had determined the robustness of several SSR markers. These primers were observed to distinguish the three popular varieties ('Carabao', 'Pico', and 'Kachamita'). Molecular marker technology will ensure the authenticity of the mango cultivars in question. In this study, proper and accurate labelling of the planting materials sold in the nurseries will be in place. In this way, the farmers are assured of their preferred cultivar. The main goal of this project is to address the problem on mislabeling of mango seedlings produced in the nursery. To date, a total of 133 plant samples from 26 commercial mango nurseries were collected for DNA extraction. Pilot testing of the developed DNA marker was done using the reference trees of BPI Guimaras and Davao. Twenty-seven (27) primers were utilized for SSR analysis of 61 carabao strain, 51 non-carabao strain and 58 blind samples. DNA analysis of the samples collected is still on going.

Keywords: *Mango, SSR markers, commercial mango nurseries, DNA analysis*

PHENOTYPIC AND GENOTYPIC ANALYSIS OF *Coffea canephora* (Robusta) USING MORPHOLOGICAL AND MOLECULAR MARKERS

Emma K. Sales, Harem R. Roca, Jeannie R. Binaohan and Jomarie V. Abubakar

Robusta coffee accounts for 75% of total production than Arabica. It is also easier to maintain due to less requirement for agricultural inputs, thrives in low elevation areas and resistant to leaf rust disease. Therefore it is very important that the varieties or species are properly identified, classified and labeled to determine variability among and within varieties or species. In view of

this, there is a need to determine if Robusta coffee accessions abounding in Mindanao are different and if so, measure the extent of variability using both Morphological and Molecular techniques. Some farmers prefer to rely on the morphological differences thus there is also a need to generate Information Education Communication materials that can highlight the phenotypic differences. However, in cases where morphological traits are unreliable and questionable, molecular markers can be handy and accurate. Thus both strategies will be utilized in this project with the following objectives: a) Inventory and collect Robusta coffee abounding in Region XII for DNA Diversity Analysis; b) Develop protocols for Robusta coffee molecular analysis; c) Screen and evaluate existing SSR markers for Robusta coffee; and d) Develop/establish database of molecular characteristics and population structure of Robusta coffee cultivars. A total of 41 commercial nurseries from Mindanao and Luzon were surveyed and inventoried. The reference variety of Robusta used as standard DNA sample were collected from Nestle Philippines, Northern Mindanao Agricultural Crops and Livestock Research Complex (NMACLRC). Results of the study shows that out of 64 SSR Primers, 16 SSR primers gave DNA Amplification with polymorphic bands.

Keywords: *Robusta Coffee (Coffea canephora), Morphological Characteristic, Molecular Analysis, Robusta coffee nurseries, DNA Isolation*

FRUIT QUALITY IMPROVEMENT IN CARABAO MANGO THROUGH QUANTITATIVE TRAIT LOCI (QTL) IDENTIFICATION FOR SCAB AND STEM-END ROT RESISTANCE BY GENOME-BY-SEQUENCING (GBS) AND GENOME WIDE ASSOCIATION STUDIES (GWAS)

Edward A. Barlaan and Emma K. Sales

Mango (*Mangifera indica*) is one of the economically important fruit crops for local consumption and export. However, mango production in the Philippines is constrained by post-harvest diseases affecting fruit quality and yield. These diseases include stem-end rot (SER) and scab caused by *Lasiodiplodia theobromae* and *Elsinoë mangiferae*, respectively. There is a need identify sources of resistance to these pathogens from various mango strains, cultivars and varieties to improve the Philippine Carabao mango for resistance to SER and mango scab. The study aimed to isolate and molecularly identify the causal pathogens and develop molecular markers associated with scab and SER resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utility in marker-assisted selection/breeding. Non-carabao varieties and strains were used as potential source of resistance to SER since the carabao mango are mostly susceptible to SER. Twenty-nine non-carabao mango fruits derived from Guimaras and Regions X, XI and XII were inoculated in vivo with stem-end rot. Results showed that 15 varieties were highly susceptible, 3 susceptible, 5 moderately susceptible, 4 moderately resistant and 2 potential varieties resistant to SER. Additional 15 mango varieties were geotagged and identified for flower induction for SER inoculation of produced fruits. Scions from same trees including other mango strains and varieties were grafted for *in situ* inoculation of scab. Typical symptoms of scab were isolated for morphological characterization and molecular identification. Five scab isolates were characterized and subject for molecular analysis. Primers specific to *Elsinoë mangiferae* were designed to confirm the identities of scab isolates.

Keywords: Mango, Stem-end rot, scab, Genotyping-by-sequencing (GBS), Genome Wide Association Studies(GWAS).

MOLECULAR DETECTION AND IDENTIFICATION OF MICROBIAL PATHOGENS OF BANANA

Edward A. Barlaan, Ana Rosa E. Cunanan, and Aurelio A. Ampo

Banana production in the Philippines is affected by different diseases causing significant reduction

in productivity. Major losses have been attributed to Panama disease caused by *Fusarium oxysporum f.sp*. *cubense*, black sigatoka by *Mycosphaerella fijiensis*, Moko or bacterial wilt by *Ralstonia solanacearum* and bunchy top caused by Banana bunchy top virus. There is a need to develop molecular detection technology that can quickly, safely and reliably identify and detect in real-time the causal pathogens in banana and soil before disease expression and outbreak. The study aimed to isolate and molecularly identify the causal pathogens, verify pathogenicity of the isolates and develop primers and probes for detection in real-time quantitative PCR (qPCR) and digital PCR. Diseased plant samples were collected from different regions in Mindanao for the isolation and purification of pathogens. Purified isolates were PCR amplified for DNA sequencing targeting the ITS gene for *Fusarium oxysporum f*.sp. *cubense* and *M. fijiensis*, 16srRNA gene for *R. solanacearum* and coat protein gene for banana bunchy top virus. Identities of the isolates were confirmed thru BLAST analysis. These isolates were used for pathogenicity tests thru inoculation in banana healthy seedlings, which expressed the diseases after inoculation. Primers and probes for each pathogen were designed from the confirmed sequences for real-time qPCR analysis. All microbial pathogens were successfully identified and detected in qPCR except *M. fijiensis*, which need further modifications in primers and probe. The qPCR assay is very sensitive while probes are effective in detecting the pathogen seven at very low DNA concentrations.

Keywords: Bunchy top, digital PCR, Moko, Panama disease, qPCR, sigatoka,

EVALUATION AND CHARACTERIZATION OF TEN PROMISING VARIETIES OF CACAO IN TYPE II AND III AGRO-CLIMATIC ZONES IN NORTHERN AND SOUTHERN MINDANAO

Cris Harvin Rey G. Calvo[1], Sheena B. Lucena[2], Jayson S. Baltazar[3]

[1]Program/Project Leader, [2]Project Staff, [3]Science Research Assistant
University of Southern Mindanao, Kabacan, North Cotabato

Ten promising cacao (*Theobroma sp.*) varieties were evaluated to determine the adaptability and other agronomic traits at seedling to fruit ripening stage. The experiment was laid out in RCBD with three replications following Good Agricultural Practices (GAP) for Cacao. Seedling survival ranged from 80100%. Significant differences were observed for the number of branches, shoot length, stem diameter and flower onset for 12, 15, 18 and 21 months after planting (MAP). W10 obtained the most number of branches (10.13) and longest shoot length at 21 MAP while BR 25 has the largest stem diameter (73.15) and earliest flower onset (8.33) at 21 MAP. Among the varieties, W10 was observed to be at par with check variety BR25 in terms of number of branches, shoot length, stem diameter and flower onset. However, these are only preliminary observations and cannot be associated yet with adaptability and yield performance of the cacao varieties.

Keywords: cacao, varieties, growth, onset

MINERAL NUTRITION OF RUBBER AND RUBBER-BASED CROPPING IN SOUTHEAST ASIA

Mel Chrisel A. Sales

To determine the factors for rubber and rubber-based nutrient management; identify the nutrient dynamics of rubber and rubber-based cropping system and assess the gaps and the needed studies in rubber and rubber-based nutrient management in the Philippines, a review was done on the mineral nutrition of rubber and rubber-based cropping system. Evaluation of soil and climate is important in the establishment and any options for development in rubber and rubber-based production. Furthermore, recognizing the influence of rubber and rubber-based systems in soil properties is important to identify the proper management options for rubber production and soil sustainability. In nutrient management, site specific nutrient and nutrient optimization studies should be done as soil properties varies spatially. Moreover, based on different studies, rubber requires higher N and K concentration, while P has a positive input-output balance. In a rubber-based system, several advantages were found compared to monocrop rubber. Rubber-based

systems improves the physico-chemical properties of soil, increase leaf litters and organic carbon, and augment labile pool of P in soil. In the Philippines, studies on nutrient management of rubber is needed as limited published studies were found. This will serve as guide for Filipino rubber farmers.

PERFORMANCE EVALUATION OF FERMENTED TEAS AS BIOFERTILIZERS AND BIOPESTICIDES AND THEIR EFFECTS ON PESTS, DISEASES AND YIELDS OF SELECTED SOLANACEOUS VEGETABLES

Purificacion O. Cahatian, Irenea S. Candolita, Naomi G. Tangonan, Elaine Genevive B. Parcon, and Micel Joy O. Tabanao

The use of synthetics fertilizer and pesticides is almost a given technology especially in commercial and semi-commercial farms. However, with the renewed emphasis on organic agriculture and the beneficial healthful advantages of pesticides-free vegetable produce, there is no best option but to use non-chemical fertilizer and non-synthetic crop protection sprays. Thus this study was conducted to formulate and test the efficacy of fermented teas applied as biofertilizer in improving yield performance and providing good control or prevention of pests and diseases of solanaceous vegetables.

Results of the survey revealed important pest and disease incidences in both nurseries and plantations. Surveys were done in small or backyard gardens to wide plantations in different municipalities of the provinces of North and South Cotabato from March to September 2020.

Generally, there were nine (9) species of insect pests recorded to cause adverse effects to the growth and development of solanaceous vegetables. These insect pests belonged to five insect orders such as Lepidoptera (Noctuidae families: *Spodoptera litura, Helicoverpa armigera, Leucinodes orbinalis*); Coleoptera (Cocinellidae family: *Epilachna pusilanima);* Hemiptera (Aleyrodidae family: *Bemisia tabaci*; Aphididae family: *Aphis gossypii)*; Diptera (Agromyzidae family: *Liriomyza sativa)* and one mite species belonging to family Tetranychidae (*Tetranychys truncates).* These insect pests are cutworms (*Spodoptera litura*), 12-spotted lady beetle (*Epilachna pusilanima*), fruitworms (*Helicoverpa armigera*), whiteflies (*Bemisia tabaci*), fruit and shoot borer (*Leucinodes orbinalis)*, leaf miner (*Liriomyza sativa*), melon aphids (*Aphis gossypii*), and red spider mites (*Tetranychys truncates*).

On the disease aspect, varying levels of severity infections were noted on tomato such as bacterial wilt (*Ralstonia solanacearum*) with 16.84%, early blight (*Alternaria solani*) with 18.52%, late blight (*Phytophthora infestans*) with 18.22%, Southern wilt (Sc*lerotium rolfsii*) with 16.87% and Anthracnose (*Colletotrichum gloeosporioides*) with 15.99 % severity infection.

Diseases and levels of severity infections obtained from the eggplant were also noted. Bacterial wilt caused by *Ralstonia solanacearum* has 11.11%, Cercopora leaf spot (*Cercospora* sp.) with 16.44%, Verticillium wilt (*Verticillium* spp.) with 8.44%, Fusarium wilt (*Fusarium oxysporum*) with 8.88%, and fruit rot (*Phytophthora palmivora*) with 19.89% severity infections.

In sweet pepper, anthracnose caused by *Colletotrichum gloeosporioides* has 18.07%, powdery mildew (*Leveillula taurica*) with 15.55%, Cercosppora leaf spot (*Cercospora capsici*) with 13.33%, Southern leaf blight (*Sclerotium rolfsii*) with 22.63%, and Verticillium wilt (*Verticillium* spp.) with 7.40%.

Meanwhile, there were ten botanical plants subjected for tea preparation, they were seasoned (7, 14, 21 days) and tested in cocktailed formulations of which each contained three components

such as fungicidal, insecticidal and nutrient-rich botanicals. Samples of each tea formulation were already subjected to pre-evaluation. The same botanical formulations were applied to the selected Solanaceous vegetables the soonest they were transferred in the field up to their last priming. Plant samples from each of the treated vegetables will be collected after certain harvest for another nutritional analyses to evaluate and validate the contained nutritional compounds as affected by the applied formulated fermented teas.

EVALUATION OF THE LARVICIDAL ACTIVITY OF *Aedes aegypti* AND *Anopheles* sp. USING MARIGOLD (*Tagetes erecta*)

Sedra A. Murray and Elma G. Sepelagio

The rise of the incidence of denque fever and malaria in the Philippines is posing an alarm. The need to explore on the larvicidal properties of some plants like Marigod (*Tagetes erecta*) to eradicate mosquitoes becomes a hot issue to ensure that the community will not be endangered of the increase breeding sites especially in bodies of water like canals where larvae of the mosquitoes usually develop and grow. The study aimed to evaluate the larvicidal activity of *Aedes aegypti* and Anopheles sp. using Marigold (*Tagetes erecta*). Marigold were grown and propagated in the backyard for mass production. Seeds were collected and were sown in seed bed. Then these were transferred to plots and watered daily. Marigold plants are now in their 5th months. The flowers are evident already. The two cages of mosquitoes were built for rearing larvae. Wrigglers of unknown species are reared in the two cages. By the time these wrigglers will grow into fourth instar larvae, that is where the start of the application of flower extracts of 30%, 60% and 90%, the positive control and the negative control to 20 viable larvae will start. The larvae are on their first instar growth as of now.

Development Category

UTILIZATION OF ELECTRONICS WASTE MANAGEMENT MODEL: THE INTERVENTION IN THE CASE OF HIGHER EDUCATION INSTITUTIONS OF NORTH COTABATO

Maricel G. Dayaday and Fredelino Galleto, Jr.

Information and communications technology (ICT) has penetrated nearly every aspect of modern life so thus E-waste has been escalating rapidly with the rise of information society. Yearly, 20 to 50 million tons of electrical and electronic equipment wastes are generated worldwide. Electronic waste become the most difficult task for many parts of the world both social and environmental problems. E-waste are electronic products like computers and mobile phones. The purpose of this study is to assess and evaluate the current practices among HEIs in North Cotabato in the implementation of E-waste management. Also, to develop an intervention and evaluate it. Using both quantitative (survey questionnaires) and qualitative (in depth interviews), the results of the study shows solid waste among HEIs goes to landfill (local garbage collection) - 53.8%, followed by informal e-waste sector (junkshop) - 23.1%. Other HEIs do not have any solid waste disposal procedure (15.4%) and only 7.7% send it back to GSO. Respondents are aware of the concept of

E-waste management (46.2% said NO while 53.8% said YES). HEIs have no formal rules and regulations and also do not discuss e-waste in their regular operations. This study is informative for formulating better policies to manage E-waste. The recycling method will vary for each material and component of E-waste. The researchers tried to work out a distinct process flow to recycle every material of E-waste such as instructional materials, arts, and planting pots that may provide many opportunities which are environmentally safe, encourage cost efficiency, and provide jobs.

Keywords: Electronic waste, E-waste management, Model, policies

PRODUCT DEVELOPMENT, PACKAGING AND BRANDING OF SMOKED CATFISH (*Clarias gariepinus*) AS "TinaHITO"

Pia Amabelle M. Flores and Jalaloden B. Marohom

The present study evaluated sensory evaluation, microbiological analysis and proximate composition of smoked catfish (*Clarias gariepinus*). Complete randomized design was used with 3 treatments (1-Control, 2- 5% Sugar Addition, 3- 5%- Sugar/Vinegar Addition) replicated 3 times. The control (no value addition) and T2 is significantly more acceptable than T3 ($p<0.05$). Texture and aroma is significantly better in T1 and T2 compared to T3 ($p<0.05$). No presence of indicator organisms *Escherichia coli* and *Salmonella* in all treatments after processed and in vacuum packed products. Total Plate Count (TPC) was higher in Formulation 2 compared to the control but both values were below detection limit for spoilage. Proximate analysis showed comparable protein (6.65- 7.04%), moisture (35.4- 37.4%), ash (18.6-25.8%), fiber (1.5-2.1%) and carbohydrates (38.2-40.1%) in all treatments. Lipid is slightly higher in T3 (32.9%) compared to control and T2 (27.5%, 32.2%). Results suggest that smoked African catfish (*C. gariepinus*) product is already acceptable without value addition thus reduced cost and higher return. But 5% Sugar addition can have comparable acceptability, microbial quality and proximate composition. Vacuum- packaging improves shelf-life of smoked catfish products refrigerated and frozen. Pure smoked catfish or 5% Sugar value addition is recommended for "TinaHITO" brand.

Keywords: product development, packaging, branding, African catfish, smoked catfish, TinaHITO

AGRO-ECO FARM TOURISM DEVELOPMENT FOR LIVESTOCK AND POULTRY IN THE UNIVERSITY OF SOUTHERN MINDANAO

Julius Jerome G. Ele, Roy C. Ricabar, Mary Joy S. Caňolas, Geoffrey R. Atok, Vic Laurence P. Oliva, Josephine R. Migalbin, Jurhamid C. Imlan, and , Eulalio Jr M. Vergara

Agritourism provides a prospect of uniting the components of agriculture and tourism productiveness. This is for the provision of educational, social and monetary benefits to the visiting tourists, owners, producers and communities. Moreover, it is a venue for providing awareness in agriculture and interaction with tourists. The main objectives of the study are to develop and establish agro-eco farms in livestock and poultry for tourism at the land area of the College of Agriculture in the University of Southern Mindanao, Kabacan, Cotabato. The livestock and poultry areas established for agri-eco tourism are the native chicken, native swine and goat. The farm animal areas have been built with fences, pasture area, range zone, a space for water and feed provision, simple water system for all the livestock and poultry including a nesting and perch area for the native chickens. The agro-eco farm of the livestock and poultry have been visited by individuals from different schools, colleges and universities, alumni and various private and government agencies.

Keywords: agro-eco farm, tourism, native chicken, native swine, goat

REVITALIZING INTELLECTUAL PROPERTY TECHNOLOGY BUSINESS MANAGEMENT (IP-TBM) IN UNIVERSITY OF SOUTHERN MINDANAO

Pia Amabelle M. Flores, Cyrelle M. Besana, Mark Henry F. De Leon
Technology Transfer and Promotion Division- Philippine Council of Agriculture, Aquatic Resources Research and Development
University of Southern Mindanao.

The IP-TBM project serves to satisfy the role of University of Southern Mindanao (USM) in technology transfer pursuant to Republic Act No. 10055 or the Act providing the framework and support system for ownership, management, use and commercialization of intellectual property generated from research and development funded by government and for other purposes. Series of activities were conducted to achieve the following objectives: 1) capacitate the technology transfer of USM personnel through IP-TBM; 2) enhance technology promotion and commercialization activities through USM IP-TBM office; 3) promote intellectual property (IP) awareness among researchers in the University; and, 4) intensify linkages with various agencies to enhance activities on IP protection and management, technology transfer and commercialization. Among the outputs of the project include: 2 graduates for IP Master Class and Technology commercialization (Tech Comm) Mentorship. These trainings enabled 4 echo-seminars on IP, Tech Comm and Tech Pitching. The project developed 21 IEC materials that were used during echo-seminars and 5 promotional activities. This project generated 38 IP assets (filed): 14 copyrights, 8 Trademarks, 13 Utility Models (UM) and 1 patent. Three UMs were granted. One technology is recipient of Excellence in UM award, the same technology that was approved for "Fairness Opinion Report" by DOST XII. The project was instrumental to the revision of Intellectual Property Policy and crafting Technology Transfer Protocol. The DOST-PCAARRD and USM IP-TBM marker was inaugurated last September 24, 2019 to commemorate collective effort of both agencies to effectively carry out IP management and commercialization of technologies derived from R&D funded by government. USM IP-TBM continues to push through its goal towards mobilizing technology transfer in the University.

Keywords: USM IP-TBM, RA 10055, Technology Transfer, Intellectual Property, Technology Commercialization,

MARKET ANALYSIS AND POSITIONING OF PROCESSED HALAL CHEVON FOOD PRODUCTS

Jalaloden B. Marohom, Ivy Mar B. Cabornida, and Lorna G. Valdez

The project started last January 2020 and is expected to be completed on June 2021. The implementation sites are key cities and municipalities in the Philippines. The objectives of the study are market analysis and branding, positioning strategies on halal chevon products and develop business plan and recommend policies.

Total respondents will be 1000 consisting of households, students and travelers selected through stratified random sampling. Survey questionnaire was converted into Google form. Six (6) label designs and one (1) trademark were filed.

Results showed that among the 56 respondents, mostly are 22-23 years old and has a household size of 4-6. Majority are male, single and Cebuano. Mostly are college graduate, have average monthly household income of 20,000php-25,000php and 38.3% are students. Chevon Carne Norte label has significant relationship with age, employment status and household size whereas the tagline has significant relationship with frequency of buying Chevon Tapa.

Respondents extremely agreed on willingness to buy products displayed in grocery stores and are tested. Mostly agreed to buy products that has halal logo. The most preferred label for Chevon Tapa and Chevon

Carne Norte was the red and yellow color combination while 67.9% preferred the green and yellow combination for Chevon Carne Norte. Majority (89.3%) preferred the tagline "MapapahuGOAT ka sa sarap!".

Willingness to buy of the respondents in terms of low price, attractiveness and unique color, accessibility, and superior performance from the brand are influenced by estimated spending and frequency of buying for Chevon Tocino, Tapa and Carne Norte.

ENHANCED AGRI- FARM TOURISM DEVELOPMENT FOR HERBS, SPICES AND MEDICINAL PLANTS

Ivy M. Pasquin

Agri-farm tourism is a new emerging value added agricultural business in the Philippines which aim to improve the income and potential viability of small farms and rural communities. It is a key element of socially and environmentally responsible tourism. Integrating herbs, spices and medicinal plants as a major component of an agro farm tourism would increase the public's awareness of its valuable uses and potentials as food. The study aims to produce a catalogue of herbs, spices and medicinal plants established in the agri-farm tourism area at College of Agriculture, University of Southern Mindanao using 31 qualitative and quantitative descriptors. Morphological data gathered from 228 plants established in the area was based on existing IBPGR plant descriptors for each species. There were already 41 plants completely characterized while on going evaluation for the remaining 187 plants.

Keywords: agri-farm tourism, IBPGR descriptors, herbs, spices, medicinal plants, morphological data

PEST AND DISEASE MANAGEMENT FOR RUBBER AND INTERCROPS

Purificacion O. Cahatian[1] (USM), Joan P. Sadoral[2] (USM), Armando G. Valiente[2](PGAS), Lira May A. Sibongga[3], and Marife T. Andoy[3]

[1]Project Leader, [2]Project Staff, [3]Research Assistant

This is Project 4 of the program entitled Land management of diverse rubber based systems in southern Philippines (SLaM 040/2017) funded by Australian Center for International Agricultural Research and Philippine Council for Agriculture and Aquatic Resources Research and Development with a duration of five years (June 2019- May 2024). This report covers June 2019 to May 2020 (Year 1).

Assessment for rubber resulted to two major and three minor rubber diseases at USM and one disease (stem rot) was recorded in Agusan del Sur. No insect pest was observed on newly planted rubber at USM while 2 leaf feeders were recorded infesting rubber in Agusan (grasshopper and pachyrrhyncid beetle). Assessment for lanzones and banana resulted to one minor disease for each crop. Assessment for diseases of corn resulted to four minor diseases and two major pests: the Fall Armyworm (FAW) and the Asian Corn borer.

Pests and Disease Management trials for annual intercrops: eggplant, corn and mungbean are on-going, using two botanical extracts.

Keywords: *pests, diseases, intercrops, assessment*

UPGRADING OF CROP PROCESSING CENTER AT UNIVERSITY OF SOUTHERN MINDANAO

Francisco Gil N. Garcia[1] and Harem R. Roca [2]
Respectively, [1]Project Leader and [2]Co-Project Leader
University Of Southern Mindanao, Kabacan, Cotabato

The project is aimed to upgrade the USM Processing Center through the acquisition of new pieces of equipment to be used in the processing of additional products with a budget of Php 5 million and DA-BAR as funding agency. Following government protocol, a series of bidding was conducted and a winning bidder was elected via Single Calculated and Responsive Bid (SCRB). All other requirements thereafter were issued by USM BAC to the winning bidder and in turn, the latter complied with all post-bidding requirements. Delivery of the various equipment is expected within the next 45 days from the date of contract signing.

Keywords: upgrade, processing, equipment, bidding, SCRB

SMARTER APPROACHES TO REINVIGORATE AGRICULTURE AS AN INDUSTRY- PHASE II SARAI – ENHANCE AGRICULTURAL MONITORING SYSTEM IN NORTH COTABATO

Adeflor G. Garcia, Purificacion O. Cahatian, Romulo L. Cena,
Rezin G. Cabantug, and Dennis F. Sarmiento

Project SARAI aims to craft crop advisories which are targeted for rice, corn, banana, coconut, coffee, cacao, sugarcane, soybean, and tomato. The crop advisories focus on integrating local weather data and drought forecast with farm management activities, specifically nutrient and water management, and proactive pest and disease monitoring. Project SARAI implements a near real-time monitoring of production areas using remotely-sensed images. Project SARAI is implemented by the University of the Philippines Los Baños (UPLB), together with 11 State Universities and Colleges (SUCs) and six National Government Agencies.

Specifically, this project aims to conduct monitoring and forecasting activities for crop (rain fed rice and cacao) health and status; develop site-specific nutrient, water, and pest management protocols for cacao and rainfed rice in selected areas in North Cotabato; evaluate and update SARAI mobile agricultural applications and ICT interventions; and enhance capacity building activities for Municipal Agri-extension workers, provincial agriculture and planning officers, researchers, and BSagriculture students on the basic application of GIS technology.

Monthly collection of canopy diameter, plant height, height of main trunk, trunk diameter, number of chupons per tree, number of main branch and main branch diameter were regularly documented based on the SARAI procedures.

Training-workshops were also conducted during laboratory schedule of 3rd Year BS Entomology Major Students and Pest Management NC II trainees on the use of the SPIDTech Application and its capability in future pest identification. Gathering of additional data for insect pests and diseases were also integrated in both rainfed rice and cacao set-ups to enhance the library of pests and diseases of the mobile application (SPIDTech). Data collection of pests was done every 2 weeks by direct counting, using insect net and observation of damage areas as set in the SARAI protocol.

The project was able also to produce and filed 14 Intellectual Property Rights (IPR) through the Intellectual Property-Technology Business and Management Office (IP-TBM) located at the University of Southern Mindanao. These products were significantly utilized by the LGU's in the crafting of their Comprehensive Land Use Plan as well as in the proactive implementation of agriculture related projects.

Since 2018, up to date, there were already 45 Municipal Agriculture Extension Workers (AEW), 412 BS Agriculture students and 18 researchers from the university who benefitted in the dissemination of information and capacity building lead by SARAI. To enhance the eagerness and enthusiasm of Agricultural Technologists and Extension Workers, they generated thematic maps of their own Municipality. Advance training-workshop on suitability, density and index mapping using Quantum and ArcGIS software was conducted by USM SARAI Team participated by Municipal and Provincial AEWs of North Cotabato. They were also encouraged to produce suitability and density map of their own Municipality.

Third year agriculture students enrolled in Soil Survey Classification and Land Use were trained with the basic clipping, overlaying and mapping of their respective barangay. Most of them were able to create maps used in their outline and manuscripts.

CURRICULUM DEVELOPMENT AND OFFERING ON HALAL SCIENCE AND SCHOLARSHIPS FOR SUC FACULTY ON HALAL SCIENCE

Emma K. Sales and Josephine R. Migalbin

Halal industry plays an important role, especially for Muslims. It is necessary that educational institutions integrate Halal Science in the course as platform for more comprehensive knowledge. The Curriculum on Halal science will benefit students to be employable and functional in the Halal industry.

This project aims to develop a curriculum on Halal Science for human capacity building of Halal stakeholders, train SUC faculty on Halal Science and develop a mechanism to sustain the program.

The team consulted Imam and Halal stakeholders which favoured the development of Halal Science Curriculum. Also, two (2) FGDs with concerned stakeholders were conducted for inputs in the crafting of the curriculum and benchmarking in Dubai, Turkey, and Malaysia for its development. Review of the programs offered were compared and assessed to suit the need of the Philippines.

Three SUCs namely University of Southern Mindanao (USM), Sultan Kudarat State University (SKSU), and Central Mindanao University (CMU) collaborate to develop the curriculum which was approved by their respective Board of Reagents.

Fourteen modules were developed for the three courses: HalSci1 - Halal Principles and Concepts (three modules), HalSci2 - Halal Food Production (seven modules), and HalSci3 Halal Food Processing (four modules). Furthermore, Virtual launching and a Webinar Series of the Certificate course live stream on Facebook were successfully conducted. Information dissemination was done to the public that a curriculum on Halal Science will be offered by USM, SKSU and CMU.

Keywords: *Halal Science, Curriculum, Halal food*

GERMPLASM COLLECTION, PRESERVATION AND PERPETUATION OF VANISHING AND INDIGENOUS PLANTS WITH FOOD AND MEDICINAL VALUE

Rezin G. Cabantug and Samsudin S. Panday

The lack of raw material sources, unavailability of plant samples, and the spatial accessibility for research leads in the realization of a germplasm collection to preserve and perpetuate indigenous crops with food and medicinal value in Philippine Industrial Crop Research Institute (PICRI). The project aims to reestablishment the research activities and possible agri-tourism in the center

while continuously providing raw materials for processing as notable agri-products of the university. The project was able to collect 26 important plants classified as 1) edible plants, medicinal and aromatic, ornamental with 5, 18, and 3 plant samples consequently. Majority of the plant samples collected were propagated through cuttings (50%) followed by root shoot (23.08%), seeds (15.38%) and there are also samples collected as grown seedlings (11.54%) with a total of 1,035 propagated samples. Among the 26 propagated plants, 12 of which were already planted in the germplasm area. The project recommends the continuous reproduction and collection of indigenous plants to exploit its food and medicinal capability for further research and development of by-products for the university.

Keywords: Medicinal plants, food nutrition, plant propagation, food processing

LIMITATIONS AND CONSTRAINTS FOR PRODUCTION OF RUBBER (*Hevea brasiliensis*) USING GEOGRAPH INFORMATION SYSTEMS (GIS) IN AGUSAN DEL SUR, PHILIPPINES

Kim Gonzales, Adeflor Garcia, Richie Lador and Nepthali Morgado

A study was conducted to determine the limitations and constraints of rubber production in the province of Agusan del Sur and to integrate GIS technology in creating a suitability map. The limitations identified were: high rainfall, high elevation, steep slopes, shallow soil depth, clayey soil texture, poor soil drainage, acidic and alkaline soils, low organic matter, and high base saturation. The soil series identified as highly suitable for rubber production were: Butuan series, Mambutay series, San Manuel series, Quingua series, Lourdes series, and Bolinao series. The soil series identified as moderately suitable were: Dolongan Series, Mambutay Series, Cabangan Series, Camansa series, Kidapawan series, Malalag series, Faraon series, and Madunga series with significant limitations of high rainfall, shallow soil depth, poor soil drainage and steep slopes.

In determining the criteria weights and the overall suitability classification, Analytical Hierarchy Process (AHP) with pairwise comparison method was used. The criteria were categorized into main and sub criteria; weights were then determined using a pairwise comparison matrix where all criteria were compared and scored based on relative importance to each other. After weighing, the consistency ratio was then calculated and results show consistency among all factors. The main criteria (Climate, Topography, and Soil Physical Characteristics) had a consistency ratio calculated at 0.0224; for the sub-criteria of soil physical characteristics (Soil Depth, Texture, and Drainage), the consistence ratio was 0.0937; and for the sub criteria of soil chemical characteristics (pH, CEC, Organic Matter, and Base saturation), the consistency ratio was 0.0451, all of which fall below 0.10 as required in the AHP method.

Overall results of the study indicate that rubber production in Agusan del Sur is very viable and has high potential to be developed as a major industry in the country.

Keywords: Suitability, Rubber, GIS, Agusan del Sur, Limitations and Constraints

LAND USE PLAN OF USMARC AND PICRI: INPUTS TO LAND USE DEVELOPMENT AND INFRASTRUCTURE PLAN (LUDIP) OF THE UNIVERSITY

Rezin G. Cabantug, Tito Jun T. Tidula, Chresil Sales, Edward A. Barlaan, Samsudin S. Panday, and Efren E. Magulama

Land use planning is a combination of instruments, tools and procedures which are used to strategies and make decisions about what is to be done in the future. Developmental issues had recently raised in the department levels due to the need for instructional and academic purposes. Research areas located in USMARC and PICRI had been also a concerned due to disease incidence

and spreading. This was initially found attributed to the intercropping of other crops used for production which eventually became an alternative host to pest and a convenient inoculation hub for disease. Unsuitable establishment of research studies which aggravates the spread of disease had been also a concerned. The segregation of inorganic, organic and halal studies exacerbates also the need for spatial management and distribution. The conduct of this project enhances and optimizes utilization and distribution of the resources of the University especially, on land factor. That eventually leads to the prudent policy crafting of Instructional, Research, Development and Tourism agenda of the University. Further, results of this project would significantly provide inputs in the compliance of Republic Act 11396 and the full implementation of Implementing Rules and Regulation on SUC's Land Use Development and Infrastructure Plan by the Commission on Higher Education.

Keywords: Campus planning, integrated, land use, university planning, tourism planning

ENHANCING ORGANIC VEGETABLE PRODUCTION FOR FARM TOURISM

Purificacion O. Cahatian and Adeflor G. Garcia

Organic Agriculture gained popularity in the Philippines with the enactment of of RA 10068 or otherwise known as the "***Organic Agriculture Act of 2010".*** Section 22 of the said act gives provision for the establishment of national, regional and provincial organic R & D and extension centers established and integrated as a major component of the existing RDE centers of DA, the DOST, the DENR, SUCs and the LGUs.

Rio Grande Farms@USM, is a Department of Tourism-accredited Farm Tourism Site featuring organic vegetables and edible landscaping. To enhance the production of organic vegetables, this project, with very minimal financial support from the university research fund embarked on organic cucumber production through a comparative study using botanical extracts as biofertilizer and biopesticide.

The squash beetle is the most abundant insect pest infesting cucumber starting when the first true leaves of cucumber emerged. Initial assessment reveal that pre-treatment percent infestation for Botanical 1 is 38.48% and reduced to 8.10% four days after first treatment application while pre-treatment percent infestation for Botanical 2 (Commercial) is 44.36% and reduced to 13.21% four days after first treatment application.

Initial yield for Botanical 1 is 18.07kg , while for Botanical 2 (Commercial) is 16.45kg.

Social Science Category

WILLINGNESS TO ACCEPT (WTA) COMPENSATION AMONG RESPONDENTS AND THE VALUATION OF THE PROVISIONING FUNCTION OF THE AGRICULTURAL LAND IN THE INUNDATED AREAS OF THE PROPOSED KABULNAN-2 MULTI-PURPOSE IRRIGATION AND POWER PROJECT (K2MIPP) IN SULTAN KUDARAT

Norma U. Gomez, Rhenalie Bello, Alaiza Hadji Ali, and Paulene Grace Favila

The main objective of this research is to provide a baseline information from respondents who

will be affected by the proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project (K2MIPP).

Quantitative analyses were used from the 290 primary data gathered from the respondents. Ordinal Logistic Regression Analysis identified variables years in schooling and willingness to be relocated are statistically significant at 1% and 5% level of significance, respectively. These are the variables significant factors in the respondents' willingness to accept (WTA) compensation when relocated once the proposed K2MIPP will be implemented. Meanwhile, willingness to relocate is positively related with the willingness to accept compensation (0.678).

Further, the analysis revealed that the Net Present Value (NPV) of the common agricultural crops grown in the inundated areas like rice, corn, coffee and rubber under the good scenario can serve as the low bound estimate of the amount of compensation per hectare that will be paid to the affected farmers.

In line of the above analysis, should the government consider paying the farmers for the lands that will be affected by the proposed K2MIPP, the result suggests that higher compensation should be given to productive and high-earning agricultural lands. With that, farmers would be willing to accept payments in return for their lands.

FACTORS AFFECTING THE WILLINGNESS OF THE RESPONDENTS TO BE RELOCATED: THE CASE OF THE PROPOSED KABULNAN-2 MULTI-PURPOSE IRRIGATION AND POWER PROJECT (K2MIPP) IN SULTAN KUDARAT

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Quantitative analysis was used from the 290 primary data gathered from the respondents. The results of the Binomial Logistic Regression Analysis shows that from the variables included in the analysis on the factors that determine the farmer-respondents' willingness to be relocated once the proposed K2MIPP will be implemented only religion was found significant at 5% level.

This only shows that our Muslim brothers-farmers were more willing to be relocated than the other respondents with other religious affiliation (-1.359). The reason for this may be due to unified decision, they have almost the same decision to willingly move to other place.

BASELINE STUDY FOR THE PROPOSED KABULNAN-2 MULTI-PURPOSE IRRIGATION AND POWER PROJECT (K2MIPP) IN SULTAN KUDARAT

Norma U. Gomez, Rhenalie Bello, Alaiza Hadji Ali, and Paulene Grace Favila

The main objective of this research is to provide a baseline information from respondents who will be affected by the proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project (K2MIPP).

Qualitative and descriptive analyses were used from the 290 primary data gathered from the respondents. The results of the Focus Group Discussion of the various stakeholders from the inundated areas revealed that the most important issues confronting them are: lost livelihood and source of income and issues on proper compensation, relocation and land conflict. On the other hand, Stakeholder Analysis show that the farmers, barangay/community, business sector, barangay officials/LGUs, youth, teachers, and IP community have low power and interest on the proposed project so the strategy for these stakeholders is to keep them informed. In terms of

stakeholder's potential for threat to organization and potential for cooperation with organization, NIA XII is a supportive stakeholder (low threat and high cooperation).

The study concluded that in any irrigation dam and power project implemented, loss to environmental ecosystem is inevitable and with the call for sustainable development it put pressure on the dam-building industry to integrate social or human as well as environmental concerns in project planning and decision-making. It is, therefore, recommended that full benefit – cost analysis incorporating both the environmental benefits and costs be made.

PREDICTORS OF PERFORMANCE OF USM GRADUATES IN THE LICENSURE EXAMINATION FOR AGRICULTURISTS: BASIS FOR THE DEVELOPMENT AND ASSESSMENT OF INTERVENTION PROGRAMS IN IMPROVING PASSING RATE

Donnie M. Tulud

In USM, there have been a number of LEA board passers since the time it started its graduate to take the exam. However, its passing rate is erratic which means there are times that it is higher than national passing rate and there are times that it is below though it produces number of topnotchers. Looking some years back, the passing percentage is below national passing rate. This trend signifies that the results posit risk on the standards of USM of providing quality academic input to its students which led to questions such as what factors that could possibly account for the performance of USM in the LEA. Despite the fact that there are available data in the university and in Professional Regulation Commission; still, these were not explored to improve to increase the number of passers in LEA. Hence, this institutional study was propelled to identify and examine the predictors of performance of USM graduates in national board exam specifically in the Licensure Examination for Agriculturists in order to develop and eventually assess intervention programs to improve passing rate. To achieve the purpose of the study, the data were collected through a standard questionnaire titled Perceived Causes of Academic Failure Inventory (PCAFI) that identified eight factors: teachers' behavior; teaching methods; lack of commitment to study; problems with learning environment; problems with subject content and examinations; psychological problems of student; future concerns related to chosen field of study; and problems of time management. Data from the survey questionnaire were used to develop an intervention program that would probably help USM LEA examinees to pass the upcoming board examination and eventually assessed the effectiveness of such intervention. A total of 32 graduates and passers in purposive samples, participated in the survey by responding in Google form link sent to their personal social media accounts. Findings indicated that all of the respondents disagree on the identified factors with the overall mean of 1.49 which implies that those factors identified are for them not perceivably contributory factors of their performance in the licensure examination. However, taken singly the indicators of those sub factors, the result showed that a greater number of the respondents agree on indicator stating" too many things to memorize" for factor Problems with the Learning Environment with a mean of 2.56, and "examination is too stressful" for factor on Content Subject and Examination with a mean of 2.63. Considering this result, the researcher proposed an intervention program relative to these sub factors which may concentrate on stress management and memory enhancement program before students will take the licensure examination. As to the third objective which is on the assessment of effectiveness of the proposed intervention programs, the results are not yet generated since all review classes and board examinations for year 2020 onwards are postponed due to COVID 19 pandemic.

PREDICTORS OF PERFORMANCE OF USM GRADUATES IN THE LICENSURE EXAMINATION FOR AGRICULTURAL AND BIOSYSTEMS ENGINEERING: BASIS FOR THE DEVELOPMENT AND ASSESSMENT OF INTERVENTION PROGRAMS IN IMPROVING PASSING RATE

Mirasol O. Verona

For Bachelor of Science in Agricultural and Biosystems Engineering (BSABE) students, passing the national licensure examination is one of the highest achievements they can attain in their chosen career. This substantiates their knowledge, progress, skills, qualifications, and intellectual capacity in their preferred profession. However, factors predictive of performance in the licensure examination over which the examinees can exercise an amount of control are often set aside and are not maximized to proliferate performance. Thus, the researcher deemed it indispensable to conduct an institutional study to determine the factors that could give the best prediction to the performance of the graduates in taking the BSABE Licensure Examination, develop an intervention program to assist USM BSABE graduates to pass the upcoming board examination and eventually assess the effectiveness of such intervention. Data were gathered from passers of BSABE program from 2016 to 2018 using a standard questionnaire titled Perceived Causes of Academic Failure Inventory (PCAFI) that identified eight factors: teachers' behavior; teaching methods; lack of commitment to study; problems with learning environment; problems with subject content and examinations; psychological problems of student; future concerns related to chosen field of study; and problems of time management. Twenty-two (22) graduates and passers in purposive samples, participated in the survey by responding in Google form link sent to their personal social media accounts. Results revealed that all of the respondents disagreed on the identified factors with the overall mean of 1.53 which implies that the identified factors are not perceivably influential factors of their performance in the licensure examination. Taken singly, results showed that a greater number of the respondents agree on indicator stating" too many things to memorize" for factor Problems with the Learning Environment with a mean of 2.67 and "I need a lot of time to study this subject" for factor Problems with Content Subject and Examination. Taking into account the results, an intervention program was developed relative to these sub factors particularly focusing on stress management and memory enhancement program before students will take the licensure examination. Results are not yet collated for the assessment of the effectiveness of the proposed intervention due to the postponement of review classes and board examinations brought by the existing pandemic.

PREDICTORS OF PERFORMANCE OF USM GRADUATES IN THE LICENSURE EXAMINATION FOR CHEMISTS: BASIS FOR THE DEVELOPMENT AND ASSESSMENT OF INTERVENTION PROGRAMS IN IMPROVING PASSING RATE

Ronel A. Naringahon

The University of Southern Mindanao (USM) is SUC IV and ISO certified. However, the performance of the University in the specified licensure examinations from 2016 up to 2018 is usually below the national passing rate. Specifically, USM failed twice out of three in Chemist Licensure Examination (CLE) from 2016 to 2018. Indeed, the results posit risk on the standards of USM. Hence, this study was conducted to identify and examine the predictors of performance of USM graduates in national board exams specifically in CLE to develop and evaluate intervention programs to improve passing rates. To achieve the purpose of the study, the data were collected through a standard questionnaire titled Perceived Causes of Academic Failure Inventory (PCAFI) that identified eight factors: teachers' behavior; teaching methods; lack of commitment to study; problems with the learning environment; problems with subject content and examinations; psychological problems of the student; future concerns related to the chosen field of study; and problems of time management. Data from the survey questionnaire were used to promulgate an

intervention program that would be expected to improve USM CLE examinees to pass the upcoming board examination and eventually assessed the effectiveness of such intervention. A total of 11 takers in the mentioned licensure examination participated in the survey by responding in the Google form link sent to their social media accounts. However, taken singly the indicators of those subfactors, the result shows that a greater number of the respondents agree on the indicator stating "I need a lot of time to study for this subject" with a mean of 2.45. Considering this result, the researcher proposed an intervention program relative to a time management program before students will take the licensure examination. In regards to the third objective which is on the assessment of the effectiveness of the proposed intervention programs, the results are not yet generated considering that all review classes and board examinations for the year 2020 onwards are postponed due to the COVID-19 pandemic.

KWENTONG BAYAN NG MGA MAGINDANAWN BILANG KAGAMITANG PAMPAGTUTURO

Shandra C. Gonsang, Rayhana A. Sugadol at Bonabai M. Wali

Ang pag-aaral sa katutubong panitikan partikular sa mga kwentong bayan ay may malaking maiaambag sa pagkatuto ng mga mag-aaral sa kultura ng mga pangkat etniko. Isinusulong ng CHED ang integrasyon ng pag-aaral ng iba't ibang kultura sa kurikulum ng mga kursong Humanidades. Kung kaya't ang pag-aaral na ito ay isang magandang tugon sa mandato ng CHED.

Layunin ng pag-aaral na makatipon ng mga Kwentong Bayan ng mga Magindanawn. Ang pagtitipon ay ginawa sa pamamagitan ng paghahanap ng mga Kwentong Bayan mula sa iba't ibang naisatitik at naisaling mga oral na panitikan ng mga Magindanawn.

Ang mga kwentong bayang ito ay idinaan sa balidasyon. Para matiyak na orihinal at awtentik ang mga kwentong bayan, bumuo ng pamantayan sa pagpili ng mga tagasuri (validator). Una, tubong Magindanawn, ipinanganak, lumaki at nakatira sa lugar. Pangalawa, edad limampu (50) pataas. Pangatlo, may malawak na kaalaman tungkol sa wika at kulturang Magindanawn. Pang-apat, maalam tungkol sa oral na panitikan ng Magindanawn.

Nakatipon ng sampung kwentong bayan ng mga Magindanawn. Mula sa sampung ito, lima ang pumasa sa isinagawang pagsusuri ng mga validator. Ang limang kwentong bayang napili ang siyang gagawaan ng sanayang-aklat na inaasahang gagamitin ng mga mag-aaral na kumukuha ng kursong Panitikan ng Rehiyon sa Kolehiyo ng Edukasyon ng Pamantasan ng Katimugang Mindanao.

Kinapapalooban ng mga magandang kaisipan na kapupulutan ng mga dakilang aral ang mga kwentong bayan ng mga Magindanawn.

Keywords: *Magindanawn, Kwentong Bayan, Pagtitipon, Tagasuri*

KWENTONG BAYAN NG MGA ARUMANEN MANOBO BILANG KAGAMITANG PAMPAGTUTURO

Nelia O. Du at Winnie O. Aquino

Ang pag-aaral sa katutubong panitikan partikular sa mga kwentong bayan ay may malaking maiaambag sa pagkatuto ng mga mag-aaral sa kultura ng mga pangkat etniko. Isinusulong ng CHED ang integrasyon ng pag-aaral ng iba't ibang kultura sa kurikulum ng mga kursong Humanidades. Kung kaya't ang pag-aaral na ito ay isang magandang tugon sa mandato ng CHED.

Layunin ng pag-aaral na makatipon ng mga Kwentong Bayan ng mga Arumanen Manobo. Ang pagtitipon ay ginawa sa pamamagitan ng paghahanap ng mga kwentong bayan mula sa iba't ibang naisatitik at naisaling mga kwentong bayan ng mga Arumanen Manobo.

Ang mga kwentong bayang ito ay idinaan sa balidasyon. Para matiyak na orihinal at awtentik ang mga kwentong bayan, bumuo ng pamantayan sa pagpili ng mga tagasuri (validator). Una, tubong Arumanen Manobo, ipinanganak, lumaki at nakatira sa lugar. Pangalawa, edad limampu (50) pataas. Pangatlo, may malawak na kaalaman tungkol sa wika at kulturang Arumanen Manobo. Pang-apat, maalam tungkol sa oral na panitikan ng Arumanen Manobo.

Nakatipon ng sampung kwentong bayan ng mga Arumanen Manobo. Mula sa sampung ito, lima ang pumasa sa isinagawang pagsusuri ng mga validator. Ang limang kwentong bayang napili ang siyang gagawaan ng sanayang- aklat na inaasahang gagamitin ng mga mag-aaral na kumukuha ng kursong Panitikan ng Rehiyon sa Kolehiyo ng Edukasyon ng Pamantasan ng Katimugang Mindanao.

Kinapapalooban ng mga magandang kaisipan na kapupulutan ng mga dakilang aral ang mga kwentong bayan ng mga Arumanen Manobo.

Keywords: *Arumanen Manobo, Kwentong Bayan, Pagtitipon, Tagasuri*

KWENTONG BAYAN NG MGA TEDURAY BILANG KAGAMITANG PAMPAGTUTURO

Maria Luz D. Calibayan at Rosemarie R. Sison

Ang pag-aaral sa katutubong panitikan partikular sa mga kwentong bayan ay may malaking maiaambag sa pagkatuto ng mga mag-aaral sa kultura ng mga pangkat etniko. Isinusulong ng CHED ang integrasyon ng pag-aaral ng iba't ibang kultura sa kurikulum ng mga kursong Humanidades. Kung kaya't ang pag-aaral na ito ay isang magandang tugon sa mandato ng CHED.

Layunin ng pag-aaral na makatipon ng mga Kwentong Bayan ng mga Teduray. Ang pagtitipon ay ginawa sa pamamagitan ng paghahanap ng mga Kwentong Bayan mula sa iba't ibang naisatitik at naisaling mga oral na panitikan ng mga Teduray.

Ang mga kwentong bayang ito ay idinaan sa balidasyon. Para matiyak na orihinal at awtentik ang mga kwentong bayan, bumuo ng pamantayan sa pagpili ng mga tagasuri (validator). Una, tubong Teduray, ipinanganak, lumaki at nakatira sa lugar. Pangalawa, edad limampu (50) pataas. Pangatlo, may malawak na kaalaman tungkol sa wika at kulturang Teduray. Pang-apat, maalam tungkol sa oral na panitikan ng Teduray.

Nakatipon ng sampung kwentong bayan ng mga Teduray. Mula sa sampung ito, lima ang pumasa sa isinagawang pagsusuri ng mga validator. Ang limang kwentong bayang napili ang siyang gagawaan ng sanayang- aklat na inaasahang gagamitin ng mga mag-aaral na kumukuha ng kursong Panitikan ng Rehiyon sa Kolehiyo ng Edukasyon ng Pamantasan ng Katimugang Mindanao.

Kinapapalooban ng mga magandang kaisipan na kapupulutan ng mga dakilang aral ang mga kwentong bayan ng mga Teduray.

Keywords: *Teduray, Kwentong Bayan, Pagtitipon, Tagasuri*

USM INDIGENOUS PEOPLES PROFILE: INPUT TO USM IP EDUCATION DESIGN

Amme Rose Legaste Blonto, Radji Macatabon, Dyane Rhea B. Bana-Ay, Ma. Lezel P. Pataray, John P. Baylon and Paul John B. Ongcoy

This research focuses on the Indigenous Peoples constituents of the University of Southern Mindanao. This project has three components, **Socio-Demographic Profile and Indigenous**

Knowledge System; **IP Learning Style and Knowledge Transmission**; and **tracer study on USM IP Research Studies.**

This research aimed to make a profile and conduct a SWOT Analysis to determine the Strength, Weakness, Opportunities and Threats of the current IP related information. The project used quantitative method. The sampling procedure used purposive, snowball approach. The instruments were a mixture of original and modified checklist and questionnaires which were validated by experts.

Result shows that IP learners scores One (1) in their owned Literature and Arts based on the rubric modified from Bennett,J.M. (2008) on Intercultural Knowledge and Competence Value Rubric. This means that they only recall/perform one to two examples/pieces but failed to cite and expound/perform accurately. Moreover, in terms of their learning style, majority are visual learners which means they prefer using graphic organizers, posters, models, picture and watching videos related to the lessons. In terms of researches conducted which has inclination to IPs, only few researches are on the data base. The theme usually focused on the cultural heritage.

INSTRUCTIONAL MATERIAL DEVELOPMENT: INPUT TO GENERAL EDUCATION (GE) COURSE ON PEACE AND DEVELOPMENT

Amme Rose L. Blonto

This study aims to develop contextualized /indigenized audio-visual instructional material in Peace and Development. This pursuit is to support CHED Memorandum Order No. 2, 2019 which revolves around the Integration of Indigenous Peoples Studies/Education into the relevant higher education curricula.

This research used Instructional System Design: ADDIE Model for material development: Analysis, Design, Development and Implementation (Watson, R). The analysis and design were found on USM IP learning profile. The IM was developed and validated by experts before its actual implementation. There are two materials compared to determine whether the instructional material has reached the value of contextualization/indigenization, the commonly used VLE material for Peace and Development and the contextualized /indigenized audio-visual instructional material. The effectivity of the material is based upon the responses of the selected research classes. Their responses are rated as determinant of learning success and is triangulated using FGDs.

The product of this research is a set of original audio-visual instructional material for General Education course on Peace and Development where contents are product of USM, Multicultural (Indigenous Peoples Center for Research, Education and Development) researches.

Key words: Indigenous Peoples, contextualized/indigenized, ISD-ADDIE Model

DEVELOPMENT AND VALIDATION OF TEACHING GUIDE IN GEOLOGY USING 7ES LESSON APPROACH AND LESSON STUDY MODEL

Hazel Ann S. Soriano

This research aimed to develop and validate a teaching guide for teaching Earth Science at the University Laboratory School (ULS), University of Southern Mindanao. Specifically, determine teachers' awareness on the use of 7Es lesson approach and lesson study model in teaching Earth Science; develop a teaching guide in Earth Science using the 7Es approach and Lesson Study (LS) model; and assess the learning guide/module based on its accuracy and quality, timeliness,

appropriateness and suitability, sequential, design and formatting, and quality of references.

The researchers used descriptive research design in determining the awareness of teachers with regards to lesson study particularly 7Es approach. The validation of the lesson study was done by three module validators using Rubric for Instructional Materials.

Findings revealed that teachers in ULS-USM were very aware of the 7Es learning cycle with an overall mean of 4.35 which implies that 7Es is a useful recommended instructional approach in Science curriculum which is consists of seven stages: Elicit, Engage, Explore, Explain, Elaborate, Extend, and Evaluate. Moreover, the Science teachers in ULS-USM were very aware on the LS model with an overall mean of 4.13 which implies that LS model is an inquiry cycle that has three phases- planning, teaching and observing, and analyzing and revising phase which support teachers to experiment, observe and improve as teachers work together to study student learning. The developed module contains three (3) lessons which include 1) Earth's Characteristics; 2) The Earth's Outer and Inner Layers; and 3) Earth's Minerals.

The teaching guide in Geology was rated satisfactory with an overall mean of 1.67 which implies that the learning module developed go beyond the required criteria in terms of accuracy and quality, timeliness, appropriateness and suitability, sequential, design and formatting, and quality of references. Therefore, it was recommended for approval and use.

TEACHING AND LEARNING ENHANCEMENT ON SELECTED GENERAL EDUCATION (GE) COURSES THROUGH OUTCOMES BASED EDUCATION (OBE)

Abubakar A. Murray and Kharlo J. Subrio

This study captures the effect of the implementation of Outcomes-Based Education (OBE) among selected GE courses in the improvement of teaching and learning. Generally, it hypothesizes that there is a considerable enhancement in the teaching and learning brought about by the intervention.

Two things were sought in the study. First is the perception among faculty and students on the impact of implementing OBE in selected GE classes. Second is the level of improvement in the student performance brought about from such implementation. Two GE courses were considered, the GE 1 (Understanding the Self) and the GE 4 (Mathematics in the Modern World).

The data gathering process of the study is conducted using two adapted pre-test questionnaires and is still ongoing for the faculty respondents.

Extension Category

SAVE LIGAWASAN MARSH: A CLIMATE CHANGE MITIGATION INITIATIVE THROUGH EFFICIENT UTILIZATION OF ALTERNATIVE ENERGY

Saque J. Amilbahar[1], Tito Jun T. Tidula[2], and Cayetano C. Pomares[3]

[1]DCE-CEIT, University of Southern Mindanao, Kabacan, Cotabato, Philippines

[2]OVPRDE, University of Southern Mindanao, Kabacan, Cotabato, Philippines

[3]Retired University Professor, University of Southern Mindanao, Kabacan, Cotabato, Philippines

Invasive alien species (IAS) are exotic or foreign plants that are introduced by people, either intentionally or unintentionally outside its natural dispersal potential. The water hyacinth

(*Eichhornia crassipes (Mart.) Solms*) and tanobong (*Phragmites spp.*) are two common IAS that currently found in the Ligawasan Marsh which affected the marsh bio-diversity by invading the area. Reproduction and production of fishes and other endemic aquatic species like crocodilians were adversely affected. These alien species pose a threat to food chain of macro- and microorganisms that subsist in the marsh. Fish production alone has significantly reduced to almost nil for only ten (10) years. To address these concerns, this project aimed to transform invasive plants into charcoal briquettes as alternative source of energy and likewise empowering the community on briquette production. Community engagement, extent of invasion survey, and preliminary production of charcoal briquette were done to determine the possibility of introducing charcoal briquetting as a means of livelihood to the marsh nearby community. Moreover, collaborative efforts were initiated with the 7th IB Philippine Army and the beneficiary community dweller of Barangay Cuyapon, Kabacan, Cotabato. Both plants successfully produced good briquette. Tanobong briquette that weighs 6 g lasted for 15 minutes when fired while 12 g water hyacinth lasted for 20 minutes. Research is continually done to determine the best carbonized-binder ratio to be introduced to the community for production and commercialization.

Keywords: alternative energy, charcoal briquettes, invasive plants, Ligawasan Marsh, Tanobong, Water hyacinth

FISH AND MEAT PROCESSING IN BARANGAY CUYAPON, KABACAN, NORTH COTABATO.

Cyra Mae R. Escalera and Milagrina P. Pomares

Results of preliminary surveys and validation in barangay Cuyapon revealed that fisherfolk - farmers have lots of resources as potential raw materials for livelihood trainings on fish processing due to the steady supplies of freshwater fishes which composed the daily catch from Liguasan marsh. Aside from fish, ducks and chickens were domesticated in the backyards of these marginalized fisher folk - farmer families. Trainings on the improvement of post – harvest technologies should be conducted to help uplift the economic and social status of the marginalized fisher folk - farmers especially during and after this pandemic period.

Translating and lay-outing the IEC materials into the local dialects is currently on the process. The proponent hopes to fully implement the trainings in November 2020 following on the IATF health protocol.

SOXAARRDEC: KAAGAPAY NG MAGSASAKA SA KRISIS AT KALAMIDAD (KMKK)

Elizabeth C. Molina, Ardniel A. Baladjay, Analyn V. Deriquito
Siony Bruño & George Cadungon

The current COVID-19 pandemic has affected the agricultural production and livelihoods especially of the poor and vulnerable households in Region 12 who are into subsistence farming since agriculture is one of the most affected sectors by the crisis.

In response to the calamity, DOST-PCAARRD initiated the program GALING-PCAARRD Kontra Covid-19 in which Quick Response Projects are being undertaken by the regional consortia. Hence, SOXAARRDEC is conducting the project KMKK. It aims to establish initiatives in selected rural communities in SOCCSKSARGEN to increase household food security and resiliency during calamities and disasters. Specifically, it aims to initiate household/backyard vegetable gardening and glutinous corn production; promote and showcase the importance of household commodity production as part of disaster risk management in coping with future challenges by natural disasters; facilitate information and knowledge sharing on best practices in responding to

disasters and calamities in agricultural communities; and strengthen the role of the consortium and its member institutions in assisting communities for disaster preparedness, risk reduction and recovery.

The project is conducted in two barangays each of Kabacan, Aleosan, Midsayap, Alamada and Tacurong. Coordination with local government units has already been done. Vegetable seeds, glutinous corn seeds and vermicast have already been distributed to six barangays. Additionally, information, education and communication (IEC) materials on vegetable production have been produced, and a survey on farmers' organic farming practice and their perception about organic farming has been conducted in three barangays.

HEALS (HEALTH, ENVIRONMENT, AGRICULTURAL AND LIVELIHOOD SKILLS) FOR SUSTAINABLE DEVELOPMENT

Analyn Gonzales, Moreno B. Java, Jr., Faith P. Buned, Glyn B. Gabano-Magbanua, Jerose L. Molina, Maribelle T. Piamonte, Hasim K. Iskak, Elizabeth C. Molina, Monaira I. Sumael, Sedra A. Murray, Joel V. Misanes and Elizabeth R. Genotiva

HEALS (Health, Environment, Agricultural and Livelihood Skills) for Sustainable Development was born out of the collaborative efforts of the extension coordinators from the different colleges of the university. The program involves the provision of holistic care to the partner community through capacity building, livelihood and entrepreneurship education, life skills and hard skills training to the agriculture, women and youth sectors in Dagupan, Kabacan, Cotabato. The program aimed to provide the beneficiaries in the partner community the chance to develop themselves as human resources equipped with the necessary skills to adapt and respond to the changing demands of time and of the world. To achieve its aim, HEALS component leaders conducted a series of Focus Group Discussions with Barangay and Youth leaders to identify the most pressing needs of the partner community. Initial results were presented back to the community for validation. The discussions highlighted the following needs identified by the partner community: (1) knowledge on poultry production, (2) processing, marketing and packaging of local products, (3) development of communication skills, (4) sports management, (5) development of livelihood skills for drug surrenderees, and (5) assistance on various agricultural needs of the community. To date, HEALS continues to address the needs identified by the partner community.

INTEGRATED VIDEO AND AUDIO LEARNING SERVICES FOR ENHANCED EDUCATION (I-SEE):

A connectivity resilience project amidst COVID-19 pandemic

Janice M. Bangoy, Ardniel A. Baladjay, Genghis Khan P. Manero, Allan G. Dalo, Juvelyn Gesulga, and Myrna R. Tan

In an era known as the society of technology and knowledge, where lifelong learning is a way of life, it is important that educational institutions have as a priority the goal of finding effective ways of providing new learning opportunities according to their environment, student characteristics, teacher training, economic crisis and advancing technology in an effort to make learning more efficient, equitable and innovative in higher education

To ensure the continuity of learning amidst the covid-19 pandemic, the University of Southern Mindanao Extension Services Office is taking additional efforts to provide remote learning services via print, radio, video online and offline electronic resources. These include printing and distributing technology production guide modules; broadcasting video lessons through Internet and radio; and, broadcasting videos through websites, portals, social media (Facebook and YouTube) accessible through computer desktops, laptops or mobile phones.

In partnership with the HEALS project team, a series of seminar-workshops on Developing Effective Print-based Information, Education and Communication (IEC) print materials were conducted to equip faculty and full time researchers with the basics of IEC materials development. These matured technologies translated into printed IEC materials shall kickstart the project information campaign via the video, audio and print format. Also, a draft cacao production guide module as e-learning material is being edited for revisions to meet the needs of the target audience. Further, a School-on-Air with the topic: Halal Goat Production, dubbed as "Teknogiya sa Radyo", is launched on October 16, 2020 along with a redesigned Extension Services Facebook page to live stream a synchronized audio and video technology guide.

Keywords: *Lifelong Learning, Learning Opportunities, Developing Effective Print-based Information, Education and Communication Materials, Online and Offline Electronic Resources, Remote Learning*

FAT TO FIT THROUGH SPORTS AND FITNESS PROGRAM FOR USM FACULTY AND STAFF: (FELLOWSHIP AND TEAMWORK TO FITNESS IN TRAINING FOR USM FACULTY AND STAFF)

Judy L. Garcia, Moreno B. Java Jr., Vinus P. Java, Eduard S. Sumera, Jessa S. Buisan, and Ruben L. Tagare

Fitness activities among government employees are very important in order to break the monotony of daily routine and to have balanced activities so as to maintain a good state of well-being. More often, these public servants are highly engrossed to meet deadlines, finish paper works and perform multi-functions as required for them to do so. As a result, sedentary lifestyle related diseases are on the rise.

Specifically, for this component, the objectives are the following: (1) to increase by 70% the normal body mass index and to (2) to provide opportunity for at least 50% of USM Faculty and Staff to engage in fitness training.

The body mass index will be measured by dividing the weight (kgs) of the clients with their squared height measured in meters. Individualized training program will be provided to every client based on their fitness level.

Due to the pandemic, there were only a handful of participants who were able to engage in the fitness program. Though, the data is expected to increase before the year ends.

Keywords: Fellowship, Teamwork, Physical Fitness, Training, Body Mass Index, Body Fat Index

KABATAAN KONTRA DROGA AT TERORISMO: KASAMA, KALINGA, KASANGGA (KKDAT: KKK): UTILIZING INFORGRAPHIC MATERIALS AS TOOL TO ASSIST FILIPINO YOUTHS FOR PREVENTION AGAINST TERRORISM AND ILLEGAL DRUGS

Ruben L. Tagare, Jr., Cheeze Janito, Marichu Calixtro and Jomar B. Esto

The future of the nation lies in the hands of today's youths. More so, the youths have the biggest counterpart for nation-building and have the ability to reshape the country's present appearance (Terrayo, 2014). Unfortunately, in the present era, 65% of Filipinos that are involved in drug cases and crime were youths (Zelfox, 2017). With this increasing number, the Philippine National Police intensifies the campaign against illegal drugs through the Comprehensive Dangerous Drugs Act of 2002. With this campaign, the Institute of Sports, Physical Education, and Recreation of the University of Southern Mindanao, Philippines was tapped to facilitate an extension program

entitled *"Kabataan Kontra Droga at Terrorismo"* (Youths Against Drugs and Terrorism) which aimed to provide various training to Sangguniang Kabataan officials and youth representatives to acquire sustainable skills that they can use in carrying tasks, providing activities, and initiating campaigns in their respective communities for the benefit of their constituents.

One of the components in the said program is the Infographic Making which is designed to help the youths acquire expertise in developing Information, Education, and Communication (IEC) materials for illegal drugs and terrorism campaigns and disseminate their outputs to the youths in their respective places. In deciding what topic should they focus on, they should consider emphasizing the most pressing issue that their community is facing.

Direct instruction, thorough monitoring, and constructive feedback of participants' progress were performed to ensure that the aims of this program were achieved. It was participated with 120 participants from 38 Barangays of Makilala, Cotabato with one compulsory output per Barangay. As result, participants were able to design and produce their outputs with contents that are relevant and responsive to the needs of youths in their respective communities and they were able to disseminate their outputs in their places.

Keywords: EIC Making; Infographic Making; KKDAT; Terrorism and Illegal Drugs Campaign; Youth Empowerment

KABATAAN KONTRA DROGA AT TERORISMO: KASAMA, KALINGA, KASANGGA (KKDAT: KKK): WAYS TO SUCCEED: ORGANIZING FOR KKDAT ACTIVITIES

Judy L. Garcia, Marlene Orfrecio, Marlon A. Mancera, and Jessa S. Buisan

With so many external factors nowadays that influence the behavioral patterns of today's generation such as the problems about drugs, addiction to the very enticing games in the internet, and some other juvenile delinquencies, these things will greatly affect the productivity of our youth of becoming the foundation of building our society and our nation in general. Needless to say, that something should be done to intervene with the current situation and to divert youth's time and attention to hone their given talents and develop skills to make them more productive in the community.

For this component, the main objective is to develop skills in the organization and management of sustainable activities in the community. Initially, assessment on issues and concerns was done in every barangay about their sports program and other concerns and participants from each barangays were tasked to create programs for their community.

Data revealed that out of 36 barangays, 100% were able to present their program proposal while 34 out of 36 barangays (94.47%) were able to submit written reports of their program proposal.

Keywords: Sports Program, Youth, Community

COLLABORATIVE BARANGAY-BASED DEVELOPMENT AND ECONOMIC MAINSTREAMING

Analyn A. Gonzales

The College of Business, Development Economics and Management through its extension and community services is guided by its mission for community development through advocacy, technology transfer, consultancy and other support services. The college identified Barangay Dagupan as one of the areas of concern in the Municipality of Kabacan, leading to the creation of

the Collaborative Barangay-Based Development and Economic Mainstreaming (CBDEM) Extension Project. The project was first launch last May 2016 from the collaborative efforts of the department extension coordinators and faculty members of the college.

The college collaborated with local government unit, private and government agencies and farmer's group to conduct extension projects and activities primarily geared towards uplifting the life of the people and the communities in Barangay Dagupan.

A total of 18 seminars were conducted to the members of Dagupan Agrarian Reform Beneficiaries - Multi-Purpose Cooperative (DARB-MPC). The seminars afforded the creation and commercialization of the coco-based product and agri-based livelihood of the barangay. The cooperative is certified by Food and Drug Administration - License to Operate as Food Manufacturer. To date, the college conduct monitoring in the area to check on how project activities are progressing. An impact assessment will be conducted to determine the significant changes brought about by the extension project of the college and to measure its effectiveness.

KABATAAN KONTRA DROGA AT TERORISMO (KKDAT: KKK): KASAMA, KALINGA, KASANGGA: **KKDAT–SPORTS AS AN AVENUE**

Norge D. Martinez, Malony F. Martinez , Priscilla P. Dagoc, Jerum B. Elumbaring, and Elpedio A. Arias

Kabataan of today viewed to be the necessary component KKKDAT:KKK within the social system. They are the tangible mirrors of forecasting the future of the society. Modern youth adopts an own status and captures an own social room with claims, such as to live their newly acclaimed energies and possibilities, and test different social roles that open its vulnerability to enter into drugs and affiliation to lawless organization. Addressing the national issues on drugs and terrorism is the main goal of the activity. This would include the provision and training of Sangguniang Kabataan officials and representatives to acquire sustainable skills that will be used in carrying the task of providing activities in their respective communities. The objective of this extension program is for SK officials and members to acquire and enhance their knowledge and skills in officiating Basketball and Volleyball games. To achieve this objective, we conducted the program in every specified area in the municipality of Makilala, Province of Cotabato. There were four clusters: Cluster 1-Sinkatulan, Cluster 2- Malabuan, Cluster 3 – New Israel and Cluster 4 – Malasila. The results revealed that participants' satisfaction with the programs was higher than average.

FAT TO FIT THROUGH SPORTS AND FITNESS PROGRAM FOR USM FACULTY AND STAFF: (FELLOWSHIP AND TEAMWORK TO FITNESS IN TRAINING FOR USM FACULTY AND STAFF): FAT TO FIT THROUGH SPORTS TRAINING PROGRAM

Judy L. Garcia, Elpedio A. Arias, Marlene E. Orfrecio, Gladys Pearl Ambrosio, Jomar B. Esto, Malony F. Martinez, Marlon A. Mancera, Jerum B. Elumbaring, Helen Grace D. Lopez, Priscilla P. Dagoc, Norge D. Martinez, Desireee Tenebroso, Marichu C. Calixtro, Jomar Esto, Queenie Tobiano, Cheeze R. Janito

The FAT to FIT extension program of ISPEAR will serve as an intervening activity to address the fitness problems of the members of the faculty and staff of USM. It will provide an opportunity for everyone to engage in varied physical activities in an extended period of time to prevent over exertion that leads to muscle pain and loss of motivation to exercise. In this program, the participant can pace themselves so that they can work on based on their level of fitness.

Specifically, for this component, the objectives are the following: (1) to increase by 70% the normal body mass index; (2) to provide opportunity for at least 50% of USM Faculty and Staff to

engage in fitness training and (3) to increase to at least 60% active participation among faculty and staff during the conduct of Faculty and Staff Meet.

Sports training programs and activities in basketball and volleyball were already designed for mass participations among clients. These activities are composed of low, moderate and high intensity wok out in order to address different level of fitness among participants. Every session is composed of varied activities to break monotony and keep the clients interested with the exercise program.

Keywords: Fellowship, Teamwork, Physical Fitness, Training, Basketball, Volleyball

Synthesis Report

(Research Category)

Agency : University of Southern Mindanao

Date of AIHR : October 21-22, 2020

Venue ***Session 1*** : Mangosteen Hall
Café Martina, USM, Kabacan, Cotabato

Date Report is Prepared : October 26, 2020

A. Review/Evaluation Process

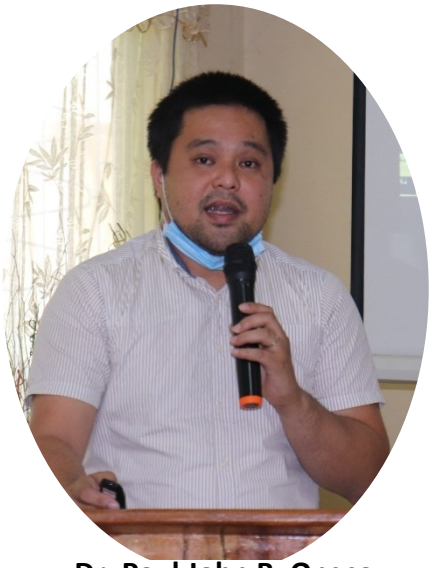
Composition of Evaluation Team

Dr. Ariston Durano Calvo
Retired University Professor, USM
Plant Physiologist/Fruit Crop Specialist

Dr. Pernelyn Soria Torreña
R & D Coordinator
PhilRice Midsayap
Plant Pathologist/Rice Specialist

Moderators

Prof. Joseph S. Quesado
Faculty, CA



Dr. Paul John B. Ongcoy
Faculty, CED

Dr. Marlyn A. Ressurreccion
Faculty, CAS

Table 1. Number of projects/studies presented and evaluated.

Sector/Commodity	No. of Projects/Studies Presented/Evaluated		
	Completed	**On-going**	**Total**
CROPS			
1. Corn		2	2
2. Fruit Crops			
2.1 Lanzones		1	1
2.2 Banana		1	1
2.3 Mango		3	3
3. Plantation & Industrial Crops			
3.1 Rubber	1	6	7
3.2 Coffee		1	1
3.3 Cacao		1	1
3.4 Herbs, Spices & Essential oil bearing crops		1	1
4. Legumes		2	2
INSECTS			
1. Stingless Bee		1	1
2. Mosquito		1	1
BIOFERTILIZER/BIOPESTICIDES		1	1
AGRI TOURISM DEVELOPMENT		3	3
TOTAL	**1**	**24**	**25**

Number of projects/studies programmed for presentation	22
Number of projects/studies actually presented	25
Number of projects/studies not reported	0
Number of projects/studies not programmed but presented	3

Best Paper Award

Best Paper : Land Suitability Analysis for Rubber (*Hevea brasillensis*) using Analytical Hierarchy Process (AHP) and Geographic Information System (GIS) in Agusan del Sur, Philippines/Adeflor G. Garcia, Kim I. Gonzales, Richie P. Lador and Nepthalie F. Morgado

Best Poster Award

Best Poster: Bacterial Quality and Chemical Content of Insect Bat as Organic Soil Amendment/Ma. Teodora N. Cabasan, C. M. Jumao-as, John Aris G. Tabora, & Edward A. Barlaan

2nd Place Land Suitability Analysis for Rubber (*Hevea brasillensis*) using Analytical Hierarchy Process (AHP) and Geographic Information System (GIS) in Agusan del Sur, Philippines/ Adeflor G. Garcia, Kim I. Gonzales, Richie P. Lador and Nepthalie F. Morgado

3rd Place Quantitative Real-Time PCR Detection of Causal Pathogens of Major Diseases in Banana/Edward A. Barlaan, Michael James L. Abrea & E.F. Alejandro

E. Information for Dissemination

- Bamboo internode, coco shell and plastic bottle as trap for stingless bees

F. Significant Findings

- Based on the analysis using Analytical Hierarchy Process (AHP) and Geographic Information System (GIS) in Agusan del Sur, different soil series were identified and were categorized into two: highly suitable and moderately suitable.

- Highly suitable areas were Butuan series, Mambutay series, San Manuel series, Quingua series, Lourdes series and Bolinao series.

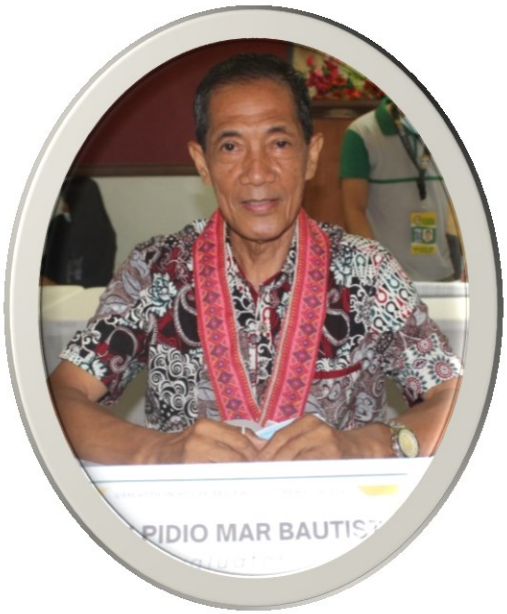
- Moderately suitable area were Dolongan series, Mambuhay series, Cabangan series, Camansa series, Kidapawan series, Malalag series, Faraon series and Madunga series.

(Development Category)

Agency	:	University of Southern Mindanao
Date of AIHR	:	October 21-22, 2020
Venue ***Session 2***	:	Lanzones Hall Café Martina, USM, Kabacan, Cotabato
Date Report is Prepared	:	October 26, 2020

A. Review/Evaluation Process

Composition of Evaluation Team



Dr. Elpidio R. Bautista
Retired President, MOSCAT
Plant Breeding & Genetics/Educational Management

Mr. Ruel Villanueva

Moderators

Prof. Girlie E. Ticbe
Faculty, CAAS

Prof. Maria Luz D. Calibayan
Faculty, CED

Prof. Nelia O. Du
Faculty, CAAS

Table 2. Number of projects/studies presented and evaluated.

Sector/Commodity	No. of Projects/Studies Presented/Evaluated		
	Completed	On-going	Total
Agro-Tourism	1	1	2
Product Development	2	2	4
Land Used		2	2
Waste Management	1		1
Upgrading Centers	2	2	4
Crops		2	2
Education		2	2
Industry Profile		1	1
TOTAL	**6**	**12**	**18**

Number of projects/studies programmed for presentation	19
Number of projects/studies actually presented	18
Number of projects/studies not reported	1

Best Paper Award

Best: Development and Product Evaluation of Adlai Butter Spread and Sayote Tea/Emilie S. Estelloso, Jenny B. Mamacus, Janice E. Reynes, April Geraldine M. Queñonero & Jo-Ann D. Santos

2nd : Product Development, Packaging and Branding of Smoke Native Catfish (*Clarias macrophalus*) ass "TINAHITO"/Pia Amabelle M. Flores & Jalaloden Marohom

3rd : Upgrading of Geographic Information Center R & D Facilities at USM/Francisco Gil N. Garcia, Kim I. Gonzales, Richie P. Lador & Nepthali F. Morgado

Best Poster Award

Best: Utilization of Electronics Waste Management Model: The Intervention in the Case of Higher Institutions of North Cotabato/Maricel A. Dayaday & Fredelino A. Galleto, Jr.

2nd : Product Development, Packaging and Branding of Smoke Native Catfish (*Clarias macrophalus*) ass "TINAHITO"/Pia Amabelle M. Flores & Jalaloden Marohom

3rd : Curriculum Development and Offering of Halal Science and Scholarship for SUC Faculty on Halal Science/Josephine R. Migalbin (USM), Emma K. Sales (USM), Luzviminda Simborio (CMU), Ruby S. Hechanova (SKSU), Normina A. Mamalinta (SKSU), Krshnon Kyle Padilla (CMU), Jurhamid C. Imlan (USM), Mark Al-jaime J. Muttulani (USM), Sandra Joy P. Pahm (USM), Normina A. Sevilla (USM), and Garry Kieth F. Escucha (USM)

D. Significant Findings

- Most HEIs in the province don't have solid waste disposal procedure, rules and regulation regarding waste disposal or formal platform for discussion of the problem.

- Smoked African catfish is already acceptable without value addition and entails reduced cost and higher return

- Local animal products and animal farm practices/ production were generated and 3 tools/design/ device were developed prospect for IP application
- The GIS Center building was already funded and is under construction to be completed by 2021.

- The project was already funded and different GIS equipment such as UAV and modular workstations is being purchased

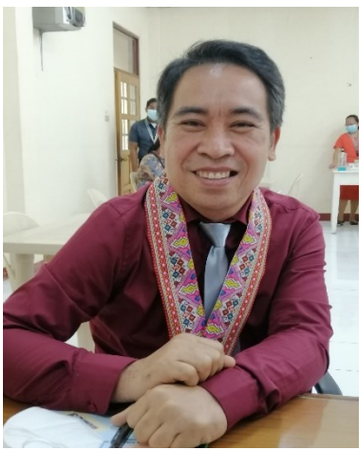
- No significant difference found among the 3 different processes of making Adlai Butter Spread and Sayote Leaf Tea

(Social Science & Extension Category)

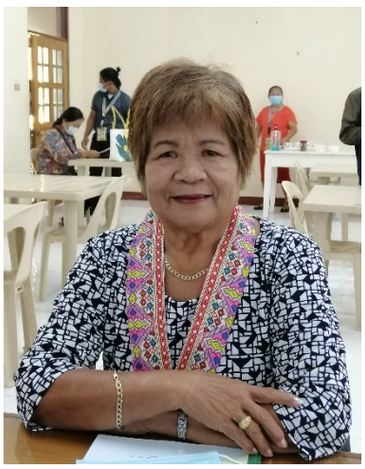
Agency	:	University of Southern Mindanao
Date of AIHR	:	October 21-22, 2020
Venue ***Session 3***	:	Social Science & Extension Category USM Extension Conference Room USM, Kabacan, Cotabato
Date Report is Prepared	:	October 26, 2020

B. Review/Evaluation Process

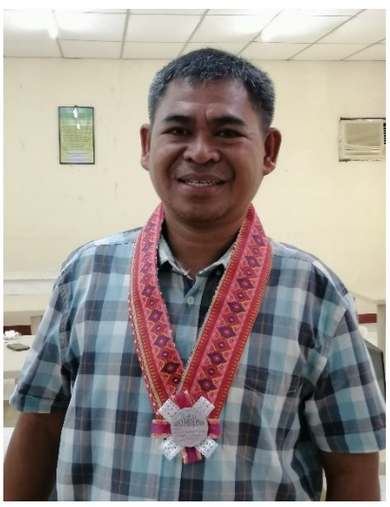
Composition of Evaluation Team



Mr. Ommal Abdulkadil
PhilRice - MES



Dr. Marcelina O. Bahalla
Retired USM Professor



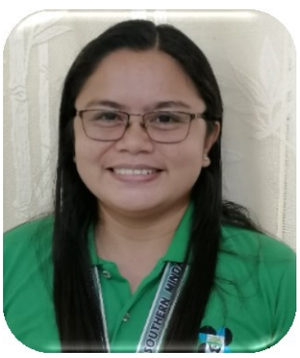
Mr. Rodelio Ambangan

Moderators

Kathleen Ivy Z. Bolotaolo

Ana Rose E. Cunanan

Rapporteurs



Jave C. Fiel

Benjie B. Mari

Daisy Jimenez

Lara Jade J. Estimo

Best Paper Award

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Social Category

Best Paper: Concretization of GAD Initiatives in USM/Jacinta T. Pueyo & Marlyn Resurrection

2nd Place: Baseline Study for the Proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project (K2MIPP) in Sultan Kudarat/Norma U. Gomez, Rhenalie N. Bello, Alaiza Hadji Ali & Paulene Grace Favilla

3rd Place: Factor Affecting the Willingness of the Respondents to be Relocated the Case of the Proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project in Sultan Kudarat/ Norma U. Gomez, Rhenalie N. Bello, Alaiza Hadji Ali & Paulene Grace Favilla

Extension

Best Paper: Save Liguasan Marsh: A Climate Change Mitigation Initiative through Efficient Utilization of Alternative Energy/Saque J. Amilbahar, Tito Jun T. Tidula & Cayetano C. Pomares

Best Poster Award

Social Category

Best : Willingness to Accept (WTA) Compensation Among Respondents and the Valuation of the Provisioning Function of the Agricultural Land in the inundated Areas of Proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project (K2MIPP) in Sultan Kudarat/ Norma U. Gomez, Rhenalie N. Bello, Alaiza Hadji Ali & Paulene Grace Favilla

2nd Place: USM Indigenous Peoples Profile: Input to USM IP Education Design/Amme Rose L. Blonto, Radji A. Makatabon, Dyanne Rhea Bana-ay, Ma. Leizel P. Pataray, John P. Baylon and Paul John Ongcoy

3rd Place: Baseline Study for the Proposed Kabulnan-2 Multi-Purpose Irrigation and Power Project (K2MIPP) in Sultan Kudarat/ Norma U. Gomez, Rhenalie N. Bello, Alaiza Hadji Ali & Paulene Grace Favilla

Extension Category

Best Poster: Save Liguasan Marsh: A Climate Change Mitigation Initiative through Efficient Utilization of Alternative Energy/Saque J. Amilbahar, Tito Jun T. Tidula & Cayetano C. Pomares

2nd Place: University of Southern Mindanao: Creating a Food Safety Culture in North Cotabato/Maria Elena N. Tanabe

3rd Place: Extension Project: Capability Building for Farmers and Agricultural Workers in Top Agricultural Communities on Healthy and Safe Work-Practices/Lydia Clemen Pascual, Emma K. Sales & Jinky Lelanie Lu

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	Nelia O. Du
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	Stephen Dave M. Dupo
	Ana Rose E. Cunanan

EMCEE

Joseph S. Quisado - Opening Program
Julius Jerome G. Ele - Closing Program

CLOSING PROGRAM

USM Cafe Martina University of Southern Mindanao
Kabacan, Cotabato October 24, 2019, 2:00 PM

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SESSION 2	**MS. JANICE M. BANGOY** Training Specialist II
SESSION 3	**ENGR. KHARLO J. SUBRIO** Education Program Specialist II
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PRESENTATION OF OUTPUT FOR EXTENSION	**DR. ARDNIEL A. BALADJAY** Director for Extension Services
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ACCEPTANCE OF RDE OUTPUTS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
AWARDING OF BEST PAPERS & BEST POSTERS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV **DR. EDWARD A. BARLAAN** Vice President for RD & E
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CLOSING MESSAGE	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
CLOSING PRAYER	**MR. MARK HENRY DE LEON** Research Assistant

EMCEE:
PROF. JULIUS JEROME G. ELE
Faculty, College of Agriculture

VISION

USM envisions upholding its status of excellence in research and development by continuing to be the pioneer source of technology and information that are on track towards poverty reduction, food security, and global competitiveness for cohesive and sustainable development among its multi-socio-cultural clienteles.

MISSION

To put into operation a system to undertake multi-disciplinary approach for R & D activities to ensure that technologies and information generated can address the prevailing concerns and issues in the local, regional and national levels for sustainable development.

GOALS

1. Improve the system with scientific excellence through collaborative and interdisciplinary R&D activities that are anchored on the University's vision/mission;

2. Conduct researches and generate technologies that could provide solutions and address the local, regional, and national concerns and issues;

3. Provide a mechanism to ensure that research results be effectively and efficiently delivered to the clients for utilization and commercialization; and

4. Build up resource generation facilities for continuous and sustainable R&D programs that are geared towards ensuring food security, global competitiveness, socio-cultural responsiveness that eventually improve the quality of life of the clienteles.

2020