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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

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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.

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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

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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.

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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
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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.

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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)

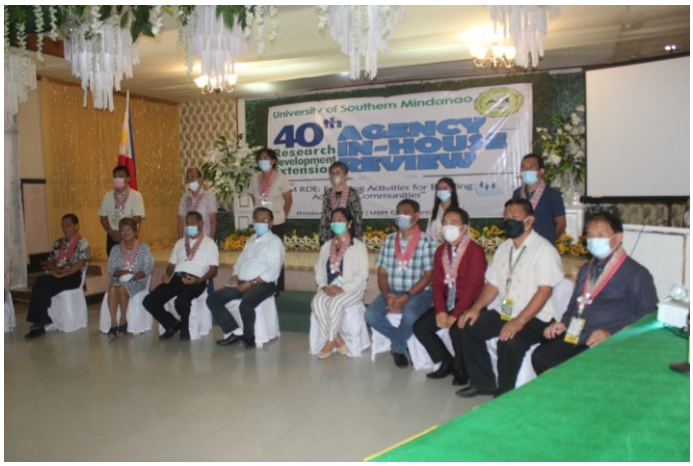
TIME	ACTIVITY
8:30 AM – 11:00 AM	Presentation of RDE Projects
11:00 AM – 12:00 PM	Poster Viewing
12:00 PM- 1:00 PM	*Lunch*
01:00 PM – 02:00 PM	Validation/Synthesis of Reports
02:00 PM - 3:00 PM	Closing Program

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]

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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

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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

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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

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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

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 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

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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

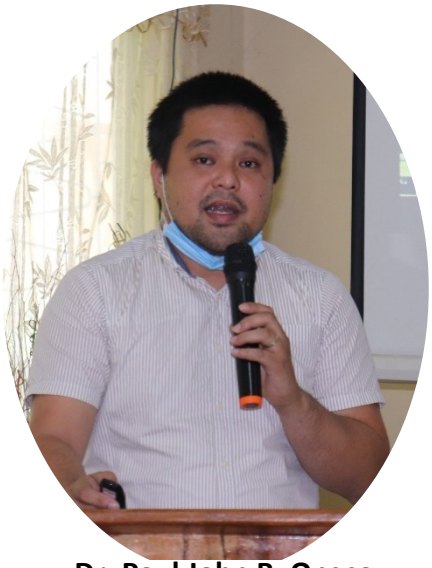
Composition of Evaluation Team

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.

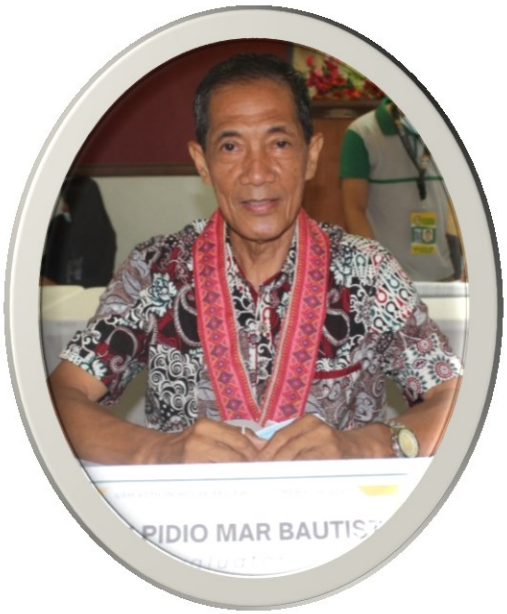
- Moderately suitable area were Dolongan series, Mambuhay series, Cabangan series, Camansa series, Kidapawan series, Malalag series, Faraon series and Madunga series.

(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

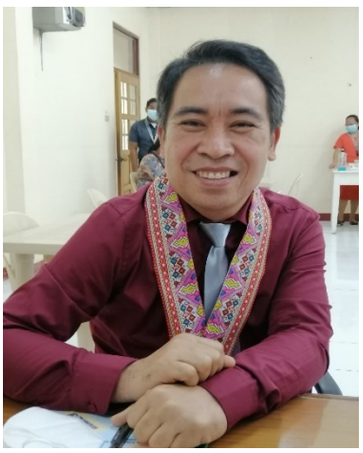
- No significant difference found among the 3 different processes of making Adlai Butter Spread and Sayote Leaf Tea

(Social Science & Extension Category)

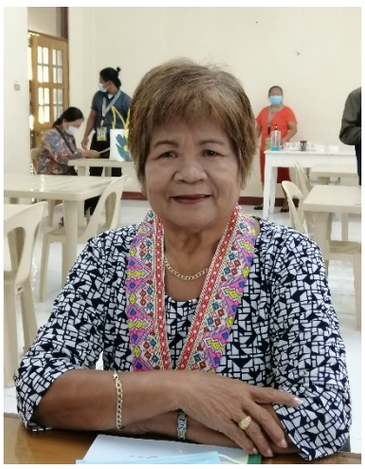
Agency	:	University of Southern Mindanao
Date of AIHR	:	October 21-22, 2020
Venue ***Session 3***	:	Social Science & Extension Category USM Extension Conference Room USM, Kabacan, Cotabato
Date Report is Prepared	:	October 26, 2020

B. Review/Evaluation Process

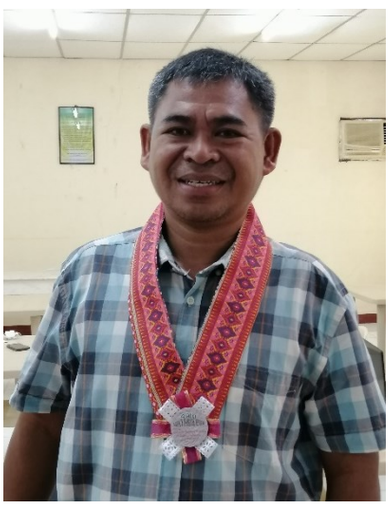
Composition of Evaluation Team



Mr. Ommal Abdulkadil
PhilRice - MES



Dr. Marcelina O. Bahalla
Retired USM Professor



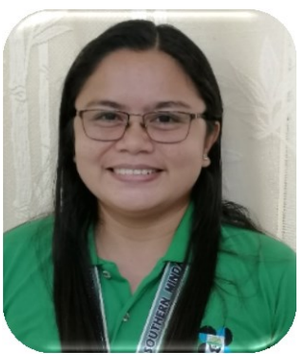
Mr. Rodelio Ambangan

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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	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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CLOSING PRAYER	**MR. MARK HENRY DE LEON** Research Assistant

EMCEE:
PROF. JULIUS JEROME G. ELE
Faculty, College of Agriculture

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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