



CARAGA STATE UNIVERSITY



4TH

QUARTER REPORT

OCTOBER-DECEMBER 2023

**OFFICE OF THE VICE PRESIDENT FOR RESEARCH
INNOVATION, AND EXTENSION**

PHYSICAL ACCOMPLISHMENT REPORT 2023



PHYSICAL ACCOMPLISHMENT REPORT 2023

PERFORMANCE INDICATOR	ANNUAL TARGETS	Q1	Q2	Q3	Q4	TOTAL
Percentage of graduate school faculty engaged in research work & actively pursuing in the last three (3) years	50%	79.01% (64/81)	79.01% (64/81)	79.01% (64/81)	79.01% (64/81)	79.01% (64/81)
Number of research outputs in the last three years utilized by the industry or by other beneficiaries	9	4	0	2	5	11
Number of research outputs completed within the year	40	7	36	14	43	98
Percentage of research outputs published in internationally-refered or CHED recognized journal within the year	40%	53.33% (16/30)	66.66% (24/36)	115.38% (15/13)		69.62% (55/79)



PHYSICAL ACCOMPLISHMENT REPORT 2023

PERFORMANCE INDICATOR	ANNUAL TARGETS	Q1	Q2	Q3	Q4	TOTAL
Number of trainees weighted by the length of training	1500	748	714.75	417.5		1880.25
Number of extension programs organized and supported consistent with the SUC's mandated and priority programs	10	5	4	0	4	13
Percentage of beneficiaries who rate the training course/s and advisory services as satisfactory or higher in terms of quality and relevance	70%	98.74 % (314/318)	97.18 % (380/391)	98.36 % (180/183)		97.98% (874/892)
Number of active partnerships with LGUs, industries, NGOs, NGAs, SMEs, and other stakeholders as a result of extension activities	9	9	2	4	1	16

PHYSICAL ACCOMPLISHMENT REPORT 2023

Actively pursuing in the last three (3) years (investigative research, basic and applied scientific research, policy research, social science research)

NAME OF FACULTY (Graduate School)	PLANTILLA POSITION	FACULTY ENGAGEMENT	
		A	Pursing advanced research degree program (Ph.D.)
		B	Actively pursuing research, with the last (3) years
		C	Producing technologies for commercialization or livelihood improvement
		D	Research work resulted in an extension program
(Surname, Given Name)		E	None of the above
CAA			
1	ANDIG, FELO MINO B.	Asso. Prof. II	B
2	AUSTRAL, TOMAS M. JR.	Asso. Prof. IV	B
3	BALANAY, RAQUEL M.	Prof. VI	B
4	BORINES, NIC O SWALD M.	Instructor I	A
5	BORINES, REZE L S.	Instructor III	B
6	CABILLO, CRISHELO	Asst. Prof. II	A
7	CANALES, RENNIELYNN F.	Instructor I	B
8	GARCIA, GLENN	Asst. Prof. IV	B
9	JOANNE, LANG RES	Assistant Prof. I	B
10	PARAC, ELIZABETH P.	Prof. 2	B
11	ROLLON, REUBEN JAMES C.	Asst. Prof. IV	B
12	SAGOC SOC, ROSALINA A.	Asso. Prof. II	B
13	SALVADOR, ROMULO C.	Asso. Prof. IV	D
14	VARELA, ROWENA P.	University Professor	B
15	LIDO, JO LIBE B.	Instructor I	B
16	VILLASICA LEO JUDE D.	Assistant Prof. II	B
CHASS			
1	Sanchez, Ruth E.	Associate Professor 3	A
2	Badiang, Sheila S	Assistant Professor 4	A
3	Masing, Anna Lyn A.	Associate Professor 2	B



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CMNS			
1	Arcede, Jayrold P.	Professor V	B
2	Domingo, Job H.	Asso Prof IV	E
3	Herrera, Fernando T	Professor II	B
4	Herrera, Miraluna L	Professor VI	B
5	Lalayada, Mary Joy R.	Asso Prof IV	B
6	Libao, Merliza F.	Asso Prof V	B
7	Macalalag, Jay Michael R.	Assi Prof IV	A
8	Ocares, Felix	Asso. Prof. 5	B
9	Paluga, Esamel M.	Professor VI	B
10	Agua, Briex Michael	Assistant Professor IV	A
11	Albia, Jake A.	Associate Professor II	E
12	Arlan, Erwin N	Assistant Professor IV	B
13	Burdeos, Karen B.	Assistant Professor 3	A
14	Demetillo, Meljan T	Professor 1	B
15	Gamalinda, Eve F.	Professor 1	B
16	Boyles, Lilia Z.	Assoc Prof 5	B
17	Jumawan, Jess	Associate Professor 5	B
18	Won, Maria Elma Q.	Associate Professor 2	B
19	Dela Cruz, Ian Niel	Associate Professor 1	A
20	Gallego, Rovelyn A.	Assistant Professor 2	A
21	Magdugo, Rexie	Assistant Professor 2	B
22	Hernando, Brent Joy H.	Assistant Professor 1	B
23	Ligalig, Rowena J.	Assistant Professor 1	A
24	Calagui, Lawrence B.	Instructor 3	B
25	Calagui, Shirlamaine	Instructor 3	B
26	Chennie S Naling	Instructor 3	B
27	Ombat, Liela A.	Professor 3	B
28	Galolo, Adam Roy	Professor 2	B
29	Jumawan, Jbycelyn C.	Professor 5	B
College of Education (CEd)			
1	Bulay, Minie L.	Assistant Professor III	B
2	Berame, Jille S.	Associate Professor IV	B
3	Liquido, Ma. Gloria E.	Professor 2	B
4	Lasco, Maris T	Assistant Professor 3	B
5	Amado, Alvic A.	Associate Professor IV	B
6	Lagura, Gladys L.	Associate Professor 3	B
7	Alegre, Emybel M.	Associate Prof. V	B



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8	Flores, Grace T	Assistant Professor 4	B
9	Codilla, Leo L Jr.	Instructor III	B
10	Cubillas, Texie E.	Associate Professor 1	B
11	Cubillas, Ariel U.	Associate Professor 4	B
12	Mercado, Rissa L.	Associate Professor II	B
13	Low, Sonia R.	Professor 5	E
14	Siganob, Joyce M.	Associate Professor 4	E
CCIS			
1	Presbitero, James V.	Associate Professor I	B
2	Jayoma, Jaymer M.	Professor IV	C
3	Candare, Rudolph	Assistant Professor IV	C
4	Dalaorao, Glenn A.	Professor II	B
5	Pitogo, Vicente A.	Professor I	B
CoFes			
1	Paz, Sheryl L.	Professor I	B
2	Sarmiento, Roger T.	Associate Professor IV	B
3	Apdohan, Julie Rose B.	Assistant Professor IV	B
4	Lador, Richie P.	Assistant Professor II	A
5	Seronay, Romell A.	Professor IV	B
6	Elvira, Marlon V.	Instructor III	B
7	Amarille, Meycel C.	Assistant Professor III	B
8	Garcia, Chime M.	Associate Professor I	A
9	Sabado, Jessa Marie	Instructor I	E
CSUCC			
1	ALAN, FRANK AIKEN O.	Assistant Professor IV	B
2	ARANTE, RAMIL B.	Professor III	B
3	AROY, VICARDO J.	Assistant Professor IV	B
4	DAMINAR, NATHALIE L.	Professor I	B
5	MARISCAL, RICHFIELD JAY L.	Assistant Professor I	B

# OF FACULTY	A	12	79.01%
	B	61	
	C	2	
	D	1	
	E	5	
81			

PHYSICAL ACCOMPLISHMENT REPORT 2023

Number of research outputs in the last three years utilized by the industry or by other beneficiaries

UTILIZATION recorded in Q4 (5)

NO	PRODUCT NAME / METHODS / PROCESS / TECHNOLOGY	PROOF	BENEFICIARY
1	Bayugan City Spatial Datasets	End-User License Agreement; Certificate of Utilization	Caraga State University (student)
2	RTR Spatial Datasets	End-User License Agreement; Certificate of Utilization	Caraga State University (student)
3	Butuan City DTM and DSM	End-User License Agreement; Certificate of Utilization	Caraga State University (student)
4	ADN Spatial Datasets	End-User License Agreement; Certificate of Utilization	Caraga State University (student)
5	Mine Virtual Reality Application	Certificate of Utilization	APEX MINING CO., INC.

Number of extension programs organized and supported consistent with the SUC's mandated and priority programs

EXTENSION PROGRAMS recorded in Q4 (4)

NO	EXTENSION PROGRAM	ACTUAL BENEFICIARIES	IMPLEMENTOR
1	Technology Transfer "Sago Processing Technology"-Phase 2	Kaba-ang Livelihood Association	CEGS Extension
2	Geotourism Advancement of the Province of Surigao del Norte	Surigao del Norte PPDO and LGUs	CEGS Extension
3	Capacitate Local and Indigenous Communities in Pagatpatan on the Formulation of Localized Herbal Medicine-Phase 2	Womens of Barangay Pagatpatan, Butuan City	CMNS Extension
4	Workshop on Design Thinking for JHS and SHS Science and Mathematics Teaching	Science and Math Secondary and Tertiary Teachers from Sibagat & Taligaman	CMNS and CHaSS Extensions

OVPRIE recorded newly published journal articles:

Article / Title	Authors	Title Of Journal or Publication
Heavy Metals in the Striped Snakehead Murrel <i>Channa striata</i> and Sediments of Lake Mainit, Philippines with Notes on Piscine Micronuclei Occurrence.	Laudiño FAR, Rhenzlyn Joy M. Agtong RJM, Elvira MVE, Fukuyama, M, JUMAWAN Joycelyn C	The Philippine Journal of Fisheries
The Nauclea, Tristaniopsis, and Terminalia forest: Exploring the lesser-known biotopes of Agusan Marsh, Philippines	Roger Sarmiento and Rowena Varela	Blo Web of Conferences
The prevailing infection of <i>Schistosoma japonicum</i> and other zoonotic parasites in bubaline reservoir hosts in the ricefield of lake ecosystem: the case of Lake Mainit, Philippines.	Estaño, L. A., & Jumawan, Joycelyn C	Parasitology
Accumulation of Heavy Metals on the Muscles of Striped Snakehead Murrel <i>Channa striata</i> in Lake Mainit, Philippines, and the Association of Its Consumption on Human Health	Laudiño, F. A. R., Agtong, R. J. M., Elvira, M. V., Fukuyama, M., & Joycelyn C JUMAWAN	Journal of Hazardous Materials Advances,
Bioaccumulation and Potential Human Health Risks of Heavy Metals in the Muscles of Tank Goby (<i>Glossogobius giuris</i>) in Lake Mainit, Philippines	Agtong, R. J. M.,audiño, F. A. R., Elvira, M. V., Fukuyama, M., & Joycelyn C JUMAWAN	Philippine Journal of Science
Butachlor at environmentally relevant concentrations induces partial feminization in male Luzon wart frog <i>Fejervarya vittigera</i> Wiegmann, 1834	Salvani, G. G., & Jumawan, Joycelyn C.	Journal of Hazardous Materials Advances,
Design of DC-DC Boost Converter Single Input Dual Output for WSN Application using 180nm CMOS Process Technology	Re-Ann Cristine O. Calimpusan, Heartsel M. Grengin, Arvin P. Inguito	International Journal of Engineering Trends and Technology
Simulation and Economic Modelling of a Floating Solar Photovoltaic (FSPV) System using PVSyst in a Philippine Lake	Jeffrey T. Dellosa	44th World Conference on Applied Science, Engineering & Technology (44th WCASET-2023)
Development and Implementation of Monitoring, Control, and Battery Charging Systems for a 2.8 kWp Floating Solar Photovoltaic (FSPV) System Prototype	Jeffrey T. Dellosa	International Association of Jesuit Engineering Schools 1st Asia Pacific Regional Conference



OVPRIE recorded newly published journal articles:

Article / Title	Authors	Title Of Journal or Publication
IoT-Enabled Aquaculture Surveillance System for Enhanced Fisheries Resource Management	Alexander T. Demetillo, Nikki Jane G. Tudio, Joedel C. Solite, Lovely Mae Dagsa, Edgardo Ricardo B. Sajonia Jr., Alfred Dennis B. Balamad	IEEE ICICAC 2023
IoT-Enabled Energy Consumption Monitoring and Control System for a Single-Phase Building	Lovely Mae Dagsa, Charle Magne L. Cillo, Jessa Lee T. Raper, Joie Lister B. Montil	IEEE ICICAC 2023
Morpho-anatomy and habitat characteristics of <i>Xanthostemon verdugonianus</i> Náves ex Fern.-Vill.(Myrtaceae), a threatened and endemic species in the Philippines. Journal of Threatened Taxa	Jumawan, Jess H., Sinogbuhan, A. J. M., Abucayon, A. A., & Taperla, P. A. T	Journal of Threatened Taxa
Molecular Dynamics Simulation of Thermal Conductivity and Vibrational Density of States of Cadmium Telluride	J.M.T. Lazarte ^{1*} , G.C. Liston	International Journal of Membrane Science and Technology,
Thermal Conductivity of Buckled and Puckered Arsenene: An Equilibrium Molecular Dynamics (EMD) Simulation	Ferdinand Michael B. Calo ^{1*} , Jessa Mae T. Lazarte ² , D'Lanor Rose C. Bedrijo	International Journal of Membrane Science and Technology,
Monte Carlo Simulation Study on the Optimal Neutron Energy and Boron Concentration for SARS-COV-2 Inactivation through BNCT	Jr Auxtero Eulogio, Jessa Mae LazarteOrneth Payac	International Journal of Membrane Science and Technology,
Calculation of Mass Attenuation Coefficients of Composite Tin Cans Using XCOM: A Computer Simulation Study	Eulogio S. Auxtero, Jr. ^{1,2*} , Jessa Mae T. Lazarte ^{1,3} , Genaro Alberio	International Journal of Membrane Science and Technology,
A Region-Based Point Cloud Down Sampling Technique for Scene Rendering Augmentation of Synthetic 3D-Modeled Objects	Jaymer M. Jayoma, Elbert Moyon, Mark Phil Pacot	ACM Digital Library

INITIATIVES, ACHIEVEMENTS, & PARTNERSHIPS

INITIATIVES, ACHIEVEMENTS, & PARTNERSHIPS

DOST Executive Committee Explores CSU's Research, Development, and Innovation (RDI) Projects During Site Visit

A delegation of high-ranking officials, including Undersecretaries, Assistant Secretaries, and Directors from various councils and attached agencies within the Department of Science and Technology (DOST) Central and Regional Offices, visited Caraga State University (CSU) on October 13, 2023. Their purpose was to personally inspect several research, development, and innovation (RDI) projects that had received funding through the DOST's Grant-in-Aid (GIA) program.

The distinguished delegation from the Department of Science and Technology (DOST) included several high-ranking officials. Dr. Leah J. Buendia, who serves as the Undersecretary for Research and Development, was present, as was Ms. Maridon O. Sahagun, the Undersecretary for Scientific and Technical Services. Additionally, Dr. Teodoro Gatchalian, an Undersecretary, graced the occasion with his presence, along with Assistant Secretary Rodolfo J. Calzado, Jr. and Mr. Cesar R. Pedraza, Director of Planning and Development. Their collective presence underscored the significance of this visit to Caraga State University.



Also present at the event were the Executive Directors of the three prominent research and development councils under the umbrella of the Department of Science and Technology (DOST). These distinguished individuals included Dr. Reynaldo V. Ebor, who serves as the head of the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD)

Dr. Enrico C. Paringit, who holds the position of Executive Director at the Philippine Council for Industry, Energy, and Emerging Technology Research and Development (PCIEERD); and Dr. Jaime C. Montoya, who holds the esteemed role of Executive Director at the Philippine Council for Health Research and Development (PCHRD). The event also had the privilege of hosting Dr. Bernardo N. Sepeda, the Executive Director for the National Research Council of the Philippines (NRCP), as well as Dr. Carlo A. Arcilla, who serves as the Director of the Philippine Nuclear Research Institute (PNRI), among other notable attendees. DOST Caraga Regional Director Noel M. Ajoc was also in attendance during the project visits in CSU.

Dr. Rolyn C. Daguil, CSU President, assisted by Dr. Jeffrey T. Delloso, the Vice President for Research, Innovation, and Extension (VPRIE), assumed the leadership role on behalf of CSU when hosting the prestigious delegation from the DOST. The visiting DOST officials were accompanied by the members of CSU's Executive Committee and administration officials including Dr. Michelle V. Japitana, VPEOAS, Dr. Alexander T. Demetillo, VPAF, and Dr. Luisito I. Tabada, VPAA among others, marking a momentous occasion for both institutions.



During his welcoming address, Dr. Daguil expressed his heartfelt gratitude for the department's invaluable support, specifically in providing funding for project proposals originating from the university. He underscored the significance of transforming project outcomes into tangible commercial assets, guaranteeing their enduring viability. This signifies the university's commitment to harnessing the results of these initiatives for commercial endeavors, whether in the form of marketable products or services, to secure their sustainability over the long term.

The ExeCom members were allowed to witness the remarkable achievements of a diverse range of projects through engaging video presentations, informative booth exhibits, and immersive facility tours. These projects encompassed a wide spectrum of objectives, including waste reduction initiatives, socioeconomic development, and the promotion of sustainable practices in mineral and mining operations.

The other project that caught the committee's attention was the "Systematized Mining Operations Using Automation and Real-Time Telematics Platform Towards a Paradigm Shift in Surface Mines of CARAGA Region (SMART Mines)," focuses on enhancing safety and efficiency within mining operations through automation and real-time telematics. Another notable project, the "CYANanobot" project is dedicated to the development of a miniaturized boat-assisted data acquisition system, leveraging optical nano-sensors for automated cyanide monitoring in wastewater. Collectively, these projects serve as a testament to the shared commitment of CSU and the DOST to the advancement of research and development, ultimately benefiting not only the region but the entire nation. This visit further solidifies the strong collaboration between DOST and CSU, emphasizing their joint efforts in driving forward RDI initiatives that contribute to the betterment of the nation, aligning to CSU President's LIKHA Agenda, the DOST's Strategic Agenda and the country's Philippine Development Plan (PDP).





CSU's sustainable mining innovations take spotlight at Mining Philippines 2023 International Conference and Exhibition

The Mining Philippines 2023 International Conference and Exhibition, held from September 19-20 at the prestigious EDSA Shangri-La Manila, brought together an array of foremost leaders, technical experts, and investors from the Philippines' mining industry as well as resource-driven countries such as Australia, Canada, China, and Japan.

The Department of Science and Technology's Philippine Council for Industry, Energy, and Emerging Technology Research and Development (DOST PCIEERD) took the opportunity to highlight the Sustainable Mineral and Mining Operations Using Industry 4.0 (SuMMO) Program inclusive of the three ongoing projects – Project 1: Information and Communications Technology 4 Responsible Mining (ICT4RM) 2.0, Project 2: MineGEARS, and Project 3: Industry 4.0 Learning Factory for Mining Engineering and Geology in the Academe Using Augmented and Virtual Reality Technologies or MARVEL Tech., implemented at the university.

The contributions of CSU at this international conference highlight the institution's pivotal role in advancing the Philippines' mining industry. As the sole university participant, it is a paragon of research and development, bridging the gap between theory and practical, real-world solutions.



Leading the charge is Dr. Rolyn C. Daguil, the University President, who was at the forefront of this remarkable journey. Alongside him is the Vice President for Administration and Finance, Dr. Alexander T. Demetillo, the SuMMO Director and Project Leader for SuMMO Project 3: MineGEARS, Engr. Rudolph Joshua U. Candare, and Summo Project 3: MARVEL Technologies Project Leader, Dr. Jaymer M. Jayoma.

CSU, partner agencies host Caraga Healthcon 2023

The Caraga State University, along with the Caraga Health Research and Development Consortium (CHRDC), the Department of Science and Technology (DOST), and the Department of Health-Caraga (DOH-Caraga) welcomed its participants for the Caraga Healthcon 2023 at the H.E.R.O Learning Commons Auditorium last November 8-9, 2023. This is the 6th convention that CHRDC has organized to date.

This year's theme revolved around "Sustainable Development in Caraga: Resilience through Health Research, Technology, and Innovation." Various academic institutions, agencies, experts, and stakeholders attended the convention to either facilitate or participate in the following activities: Plenary Sessions, 3-minute Pitch to Policymakers Competition, Wellness Sessions, Health Quiz Bowl, Visual Poster Exhibit Contest, Oral Health Research Paper Presentation, and Health Technology Idea Pitching Competition.



CHRDC celebrates Caraga Healthcon 2023, formerly known as Caraga Health Research Forum (CHRF), every November of the year to push on with its mission of 'addressing health challenges, finding solutions to health issues, and prioritizing health research and development.'

CSU hosts workshop for climate-secure and peaceful Mindanao

The Consultative Group of International Agricultural Research (CGIAR)- Climate Resilience Initiative, known as ClimBeR, is taking proactive steps to bridge gaps in climate security and environmental peacebuilding in Mindanao.

In a significant move, its experts conducted a three-day workshop last October 24-26, 2023, at H.E.R.O. Learning Commons Auditorium, Caraga State University. The workshop focused on laying the groundwork for a robust Community of Practice (CoP) dedicated to addressing the unique challenges faced by the region. Caraga State University hosted the activity as one of its organizers.

The event brought together stakeholders with diverse expertise, fostering a collaborative environment to address Mindanao's intertwined climate change and conflict challenges. The workshop witnessed enthusiastic participation from individuals representing government agencies, non-governmental organizations, local communities, and academia.



Together with CGIAR and CSU, the collaborative activity was also organized by Agusan del Sur State University College of Agriculture and Technology, Mindanao State University – Iligan Institute of Technology, ECOWEB, and CGIAR FOCUS Climate Security. The initiative aimed to facilitate the exchange of ideas, experiences, and innovative strategies to bolster resilience against the impacts of climate change and conflict in Mindanao.

The 2023 LIKHA Summit (SciTech4Dev Forum)

This year's LIKHA Summit, a contextualized rebranding of the formerly known SciTech4Dev Forum, will be on November 20-24, 2023, at the Caraga State University HERO Learning Commons. The inspiration behind LIKHA Summit is etched in this year's theme: 'Leveraging Innovation, Knowledge, and Holistic Adaptation,' embodying the University's commitment to harnessing innovative ideas and knowledge while taking a comprehensive and holistic approach to adaptation.

As part of the summit's fresh take on forums, this year's edition will provide an avenue for stakeholders in Caraga to present their sectors' needs and challenges. These shall be used by researchers in coming up with solutions specifically aligned with said demands. Pitching for these proposed solutions will then be established to ensure collaboration among the academe, the industry, and the local government networks.

CSU aims to make a meaningful and measurable difference in the region's development, fulfilling the vision of becoming a digital, innovative, and entrepreneurial University. The LIKHA Summit also aligns with the various regional agencies' plans for Caraga.





The LIKHA Summit 2023, anchored on the principles of SciTech4Dev, unfolded its first day with a series of deliberate sessions aimed at fostering collaboration, addressing societal challenges, and propelling innovation in Caraga State University.

VPRIE Dr. Jeffrey T. Dellosa started the series strong with a speech emphasizing the advancement of research and development beyond traditional metrics. The highlight speech of this morning came from Dr. Rolyn C. Daguil, CSU President, unveiling the LIKHA Agenda. Dr. Daguil underscored the need for increased innovation to address Caraga's challenges.

The summit then transitioned to insights from within CSU, as Mr. Henson Dejarme, CMNS Dean, presented the challenges faced by the university and how they successfully navigated through them.

The morning session also brought forth esteemed speakers from external institutions. Dr. Albertson D. Amante, VPRIE of Batangas State University, and Dr. Francis Aldrine Uy, President of USHER Technologies Inc. and Mapua University Fellow, shared their success stories and experiences.

The collaboration spirit continued to flourish as representatives from key government agencies took the stage in the afternoon session. National Economic and Development Authority (NEDA), Department of Information and Communications Technology (DICT), Department of Trade and Industry (DTI), Department of Science and Technology (DOST), and Department of Interior and Local Government (DILG) outlined their plans for the Caraga Region in the coming years. The alignment of these plans across different agencies presented a holistic approach to regional development.



The second day commenced with a groundbreaking session of Reverse Pitching, providing a unique platform for stakeholders from key i2FAME sectors in Caraga to articulate their actual needs and research and development (R&D) gaps. The program extended with insightful presentations addressing industry concerns, featuring contributions from the Department of Trade and Industry (DTI) Caraga and DOST Caraga's Provincial Directors, representing local government units (LGUs) in various provinces.



Caraga State University (CSU) wrapped up the third day of the LIKHA Summit 2023, culminating in an enlightening open house that showcased the cutting-edge technologies and innovations developed by its Research, Development, and Innovation Centers (RDIs). Serving as a dynamic platform for engagement, the event allowed stakeholders to explore a diverse array of projects aimed at addressing pressing challenges and contributing to the region's sustainable development.



The fourth day of LIKHA SUMMIT 2023 witnessed a transformative environment as it hosted the Technology Matching & Proposal Writing Workshop, a cornerstone of the ScieTech4Dev initiative. The day commenced with an engaging presentation by esteemed RDI Center Directors, unveiling the latest technological advancements.

In addition, the workshop continued with a comprehensive discussion led by CSU's Research Service Director, Dr. Sherryl L. Paz, outlining the Rationale and Mechanics of the Proposal Writing Workshop. Participants, including CSU RDI Centers/Faculty Researchers and stakeholders, delved into the intricacies of Patent Search to ensure project uniqueness and applicability. Engr. Rudolph Joshua U. Candare then emphasized the imperative of the Diffusion of Research Outputs, highlighting the commitment to translating research into tangible solutions.

The whole week was filled with exploration into innovation and renewed dedication to solving regional challenges. Representatives from the Research Development and Innovation (RDI) Centers showcased capsule proposals, demonstrating the diverse expertise of CSU researchers.



Caraga Regional Innovation and Start-up Week

The Caraga Regional Innovation & Start-up Ecosystem was conducted on November 21-24, 2023. This activity gathered State Universities and Colleges (SUCs) and Higher Education Institutions (HEIs) within the Caraga Region to participate in workshops and pitching competitions.

The event aims to catalyze entrepreneurial spirit, foster technological innovation, and promote sustainable development within our community by providing aspiring entrepreneurs and creative minds with a dynamic platform for collaboration, idea incubation, mentorship, and networking.

CARAGA STARTUP WEEK 2023 is also a startup competition that brings together Higher Education Institutions (HEIs) and State Universities and Colleges (SUCs) in Caraga Region that will feature innovations in ***Agriculture, Mining, Education, Smart Sustainable Cities and Tourism*** among others. This activity aims to establish a comprehensive Startup Ecosystem in the region to convene innovative minds and turn unique ideas into reality.



7th TBI Summit: CSU signs MOU for DOST PCIEERD's ReSEED Program

Caraga State University, along with fifteen other Higher Education Institutions, participated in the Memorandum of Understanding (MOU) Ceremonial Signing for the DOST PCIEERD's ReSEED Program at the 7th TBI Summit held in Iloilo City on November 21, 2023. Vice President for Research Extension and Innovation, Dr. Jeffrey T. Dellosa, represented CSU on behalf of CSU President Dr. Rolyn C. Daguil. The launching of the Regional Startup Enabler for Ecosystem Development (ReSEED) Program during the summit signifies a notable stride in strengthening the startup's solid foundation, such as access to markets, financial backing, supportive policies, and community support that are crucial components for startup ecosystems to thrive.

The Caraga Regional Innovation and Startup Ecosystem (CaragaRISE) consortium of CSU is among the regional consortia in the country dedicated to enhancing the startup ecosystem in the Caraga region.



CSU's mission is to cultivate a globally competitive and socially responsible workforce, contributing to the sustainable and inclusive development of the Caraga Region and beyond. CaragaRISE is CSU's way of helping Caraga Region rise from being identified as one of the poorest regions through innovation and the formation of tech-based startups, anchored on the Leveraging Innovation, Knowledge, and Holistic Adaptation (LIKHA) Agenda of CSU.

This mission is shared with other HEIs in the region, such as the Agusan del Sur State College of Agriculture and Technology (ASSCAT), Father Saturnino Urios University (FSUU), North Eastern Mindanao State University (NEMSU), and Surigao del Norte State University (SNSU) as well as partner agencies like the Department of Agriculture (DA), Department of Information and Communications Technology (DICT), Department of Science and Technology (DOST), Department of Trade and Industry (DTI), and National Economic Development Authority (NEDA). Through this MOU and the commitment of the partner agencies, Caraga Region's future is already ensured.

CSU hosts NRCP's 21st Mindanao Regional Cluster Convention and Stakeholders' Engagement

The Department of Science and Technology - National Research Council of the Philippines (DOST-NRCP), in partnership with Caraga State University, Mindanao Development Authority (MinDA) and the Department of Science and Technology (DOST) Caraga Region, held its 21st NRCP Mindanao Regional Cluster Convention and Stakeholders' Engagement: Strengthening Network with LGUs, HEIs, and the Third Sector from November 30, 2023, to December 1, 2023, at the HERO Learning Commons. This year's theme for the convention was "Towards a Positive VUCAD2 Future: Science Technology and Innovation's Role in Sustainable Development in the Mindanao Region."

University President, Dr. Rolyn C. Daguil, personally welcomed the NRCP representatives headed by Dr. Ephrime B. Metillo, Chair of NRCP Mindanao Regional Cluster. This is the first time CSU has hosted a two-day convention for the NRCP.

The first day of the convention featured poster exhibits from Higher Education Institutions (HEIs) and paper presentations from Northern Bukidnon State University, Ateneo de Davao University, and the Ministry of Science and Technology - Bangsamoro Autonomous Region in Muslim Mindanao. Discussions related to the benefits and roles of being an NRCP member and the oath-taking of new associates and regular members also occurred. The second day of the convention involved the stakeholders' engagement.

Featured on the second day were the plenary sessions, breakout sessions, and research presentations involving policy research for local government legislation, eco-tourism, transdisciplinary research, etc.



Through this convention, everyone who attended learned how they would be able to contribute to the sustainable development of the Mindanao region.

AWARDS AND RECOGNITIONS



AWARDS AND RECOGNITIONS

CSU's Food Innovation Center wins 3rd Place during the RSTW's InnovEats Pitching Competition

On October 1, 2023, the Food Innovation Center (FIC) at CSU participated in the InnovEats Pitching Competition as part of the Regional Science and Technology Week (RSTW) 2023 in Surigao City. The competition provided a platform for innovators to showcase their food products to a panel of experts in food innovation.

During the competition, FIC presented Tropical Fruit Flavored Chips (TroChips), a new and innovative snack that combines traditional Filipino snacks with modern food technology. Made from locally sourced ingredients, TroChips aims to promote healthy eating habits among consumers. The judges were impressed by TroChips and awarded it 3rd place in the competition, along with monetary rewards and product optimization support. This recognition is a testament to the hard work and dedication of the FIC team in creating innovative and healthy food products.



Navigatu's SnapScout and ClassMeet win 1st and 3rd places in Philippine Startup Challenge - Regional Pitching Competition

The Department of Information and Communications Technology (DICT) – Caraga Region recently held the Philippine Startup Challenge (PSC) - Regional Pitching Competition (RPC) via Zoom Platform on October 16, 2023. Ten (10) teams out of the 26 teams pitched their innovative ICT ideas and solutions in this year's RPC.

The startup teams pitched their ideas before Ms. Keren Happuch Lacadin, Deputy Focal of ICT Industry Development Bureau Region 10, Founder and CTO of Web Wiselabs Mr. Kevin Felisilda, and Dr. Franch Maverick Lorilla, Technology Business Incubator (TBI) Manager of Cagayan de Oro Business Incubation Technology Entrepreneurship and Startups (CDO b.i.t.e.s.) represented by Christian Rey M. Alison.

Caraga State University and Navigatu Incubatee's ClassMeet, composed of Arabela Mae Matias, Bryan Ian Ramos, and Selywn Rollorata, bagged 3rd Place. AdvocaSeeks from Mainit National High School came in 2nd Place. Startup team SnapScout, also from CSU and composed of Elijah Banguis, Gio Gonzales, Klint Jerald Matugas, Mike Andre Puspup, and Mary Abigail Soliva, was declared the champion of this year's Regional Pitching Competition.

SnapScout will proceed to the semifinal round and have a chance to represent the Caraga Region in the Philippine Startup Challenge Pitching Competition.



CSU secures championship and third prize in DOST's RICE 2023 - Mindanao Leg

Caraga State University (CSU) has emerged as a powerhouse of innovation and excellence, securing top honors at the DOST 2023 Regional Invention Contest and Exhibits, held in Cagayan De Oro City on October 4-5, 2023. The university clinched the championship and secured the third prize, demonstrating the exceptional talents and commitment of its students and faculty.

The Champion for the SIBOL AWARD for Outstanding Student Creative Research for College was awarded to Ms. Leizl B. Caserial and Christine Laurence Cocon, while Ms. Hanzel Caringal claimed the third prize.

CSU celebrated these individual achievements and extended its congratulations to the eight finalists in the College Category for Outstanding Student Creative Research (SIBOL). These students represented the Department of Electronics Engineering, guided by the remarkable leadership of Engr. Re-Anne Cristine O. Calimpusan and the College of Engineering and Geoscience, led by Engr. Lorie Cris S. Asube, with mentors, Dr. Alexander T. Demetillo, Lovely Mae Dagsa, and Ronieto Mendoza.

The DOST 2023 Regional Invention Contest and Exhibits (Mindanao LEG) was a highly competitive event, featuring numerous universities and colleges across Mindanao.



CSU's exceptional achievements underscore its unwavering dedication to excellence in innovation and commercialization, all under the inspiring leadership of CSU President Dr. Rolyn C. Daguil.

These accomplishments in the fiercely contested SIBOL College category, where various universities and colleges from Mindanao participated, further highlight CSU's commitment to excellence in innovation and research.

CMNS, CCIS clutch top awards at HealthCon 2023

Students from the College of Mathematics and Natural Sciences (CMNS) and the College of Computing and Information Sciences (CCIS) secured top spots in the competitions held during HealthCon 2023, the 6th Caraga Health Research and Development Convention at the HERO Learning Commons from November 8-9, 2023.

Coach Mr. Jashin C. Rosal and his students Yanna Heart Bande, Kate Lindsay Montesclaros, and Jabes Nemuel A. Sono from the Department of Biology emerged as First Place (Champion) in the Health Quiz Bowl. In addition, two startup products, VibrioSolve and Mental Boost, representing CMNS and CCIS respectively, were chosen among the Top 5 Finalists in the Health Technology Ideation Pitching.



The VibrioSolve: Phage-based Alternative to Antibiotics in Controlling Vibrio Infections in Aquaculture of Maegan D. Fumar, John Andrew L. Daminar, and Fidel James R. Lanuevo was coached by Ms. Maria Elma Q. Won, Chairman of the Biology Department. CCIS's startup Mental Boost, the recent Navigatu Pitching Competition winner, was also selected as one of the top 5 finalists. The Incubation Project Head of Navigatu TBI, Ms. Jenelyn Refamonte-Asis, served as the coach of Edzel B. Mulig, Desiree S. Olvido, and Katherine Nicole Rose E. Abecia for the startup.

The annual Health Technology Pitching Competition, organized by the Caraga Health Research and Development Consortium (CHRDC), provides students with a platform to present creative solutions for addressing urgent health concerns in the Caraga region.

ECE student-researchers lock 2nd runner-up, top 5 places in Xinyx Unlocked Competition

Two teams of BS Electronics Engineering (ECE) students secured the 2nd runner-up and top 5 positions in the latest Xinyx Competition. This year's national technology pitching event focused on 'From Problems to Possibilities: Building Tomorrow's Cities Today.'

The research titled **'Design and Development of a Monitoring System for Floating Solar Platforms'** by Ricky Pie Resonable, Harvey Abiagador, and Jocelyn Llorente secured the second runner-up position. This announcement followed the revelation of the Top 5 finalists, where the research titled **'Design and Development of Pico Hydro and Monitoring System for the Generation of Electricity'** by Lydelle P. Arcite, James Michael Yula, Jesryniel Plaza, and Jocelyn Llorente was included.

'The two CSU teams from the final five were selected from an initial pool of ten teams, out of 58 engineering entries across the country,' expressed the Vice President for Research, Innovation, and Extension Jeffrey Dellosa in his Facebook post. He, along with Engr. Ronieto Mendoza and Engr. Re-Ann Cristine O. Calimpusan accompanied the student-researchers in Muntinlupa as coaches

Xinyx Unlocked is a platform for students to demonstrate their resourcefulness, creativity, and adept application of technical skills in their academic domains. This competition encourages participants to craft innovative solutions with the potential to make a meaningful and positive impact on their local communities.

Among Xinyx's many activities, the Unlocked Competition was the most awaited segment, where ten predetermined student teams pitched and defended their innovative ideas and projects. The Caraga State University congratulates the winners, coaches, and the Department of Electronics Engineering for this feat!



HIGHLIGHTS OF ACCOMPLISHMENTS

Technology Transfer and Licensing Office (TTLO)

Application of IP to IPOP HL including Patent, Utility Model, Copyright, and other types of IP in the university and from the MSME

INVENTION

No	Title	Filing Date	ITSO
1	Composition of Fruit Crisp Candy	January 24, 2023	CSUCC
2	Spanish Style Fish Product	January 24, 2023	CSUCC
3	A Device for Drying Natural Fiber	July 17, 2023	CSU
4	An Integrated Machine for Processing Potatoes	July 17, 2023	CSU
5	A COMPOSITION OF VEGETABLE FOOD BAR	September 28, 2023	CSUCC
6	A Device for Harvesting Agricultural Compost	13 November 2023	CSU
7	A Processing Device for Cacao Beans	13 November 2023	CSU
8	An Automated Biomass-Fueled Crop Drying System	14 November 2023	CSU

UTILITY MODEL

No	Title	Filing Date	ITSO
1	Entrance Screening System	January 30, 2023	CSUCC

COPYRIGHT

No	Title	Author
1	Participation and Teaching Assistantship	Dr. Julie S. Berame, et.al
2	Laboratory Workbook in Developmental Biology	Dr. Joycelyn Jumawan & Jashin Rosal



Updates of the Patent Inventions filed

Bibliographic		Application Sub-Type	
Application Type	Invention	Status	EXAMINED/swearing condition to prepare patent certificate
(10) Registration Number and Date		(40) Publication Number and Date	PH 1/2021/06020 A1 2023.06.14
(180) Expiration Date		(87) PCT Publication Number and Date	
(20) Filing Number and Date	PH 1/2021/06020 2021.12.09		
(86) PCT Filing Number and Date			
(85) National Entry Date			
(80) Priority Details			
(51) IPC Classes	C7 F20B 9/06 (2006.01)		
(71/72) Applicant	C7 (EN) CARAGA STATE UNIVERSITY		
(72) Inventor	(EN) OLAYBARI, Angelica L. (EN) ASANUR, Naisy R. (EN) BERTULFO, Jack O. (EN) OLAS, Mark Lester C.		
(74) Representative Name	(EN) BERTULFO, Jack O		
(54) Title	(EN) A DEVICE FOR DRYING OF AGRICULTURAL CROPS		

Bibliographic		Application Sub-Type	
Application Type	Invention	Status	EXAMINED/in checking condition to prepare patent certificate
(10) Registration Number and Date		(40) Publication Number and Date	PH 1/2020/060906 A1 2022.06.13
(180) Expiration Date		(87) PCT Publication Number and Date	
(20) Filing Number and Date	PH 1/2020/060906 2020.12.07		
(86) PCT Filing Number and Date			
(85) National Entry Date			
(80) Priority Details			
(51) IPC Classes	C7 B02C 13/00 (2006.01)		
(71/72) Applicant	C7 (EN) CARAGA STATE UNIVERSITY		
(72) Inventor	(EN) ABACAHN, Cywin D (EN) CAPUTAN, Jabele J (EN) ESTACION, Dori Koshi S.		
(74) Representative Name	(EN) DELLOSA, Jeffrey T (EN) BERTULFO, Jack O		
(54) Title	(EN) A DEVICE FOR EXTRACTING OUT THE STARCH FROM STARCH PRODUCING CROP		

Patent Searches

1. Nipa Fruit Candy
2. Spanish Style Fish Products
3. Entrance Screening System
4. Vegetable Food Bar
5. Biomass-fired Dryer
6. Hybrid Cacao Roaster
7. Mushroom Bagger
8. Near Infrared Cacao Roaster

9. Potato Processor
10. Abaca Fiber Dryer
11. Automated Chick Brooder
12. Coffee Bean Harvester
13. Mechanical Siever
14. Palm Oil Frond Splitter
15. Rubber Latex Extractor
16. Sugar Processing Machine
17. Herb Fruit Blends

Technology Transfer & Licensing Office Policy Development

Develop or Implement Policies and Processes to Enable IP Protection and Technology Commercialization in CSU.

No	Title	Status
1	Spin Off Policy	Revised. For Submission, Discussion & Approval
2	Customer/Client Profile Form	Revised and Approved
3	IP Disclosure Form	Revised and Approved
4	Deed of Assignment for Patent/UM	Approved
5	Certification for Substantial Use of University Resources (as attachment to thesis manuscript)	Form for QUAMS Approval
6	Conduct of Patent Search	Revised and Approved
7	Conduct of Patent Drafting	Revised and Approved
8	Technology Licensing & Commercialization	Revised and Approved

Technology Transfer/Commercialization

Technology Commercialization poses persistent challenges for TTLO. Recognizing the significance of connecting with stakeholders and potential technology adopters, TTLO has undertaken several strategic activities to facilitate this process.

Commercialization of Mapx

MOA with Municipal Government of Mainit

Memorandum of Agreement between the Municipal Government of Mainit and Caraga State University done on September 1, 2023 for the technology commercialization of “Manage your Assets, Properties and Map it for Visualization”, otherwise known as “MapX”, a software platform for online WebGIS mapping, specifically, tax mapping, parcellary mapping, property valuation and assessment, tax collection, spatial analysis visualization, and map digitization in which LGU-Mainit shall allocate the amount of Three Hundred Thousand Pesos (Php 300,000.00) to CSU as the Contract Price.





Technology Transfer/Commercialization

Technology transfer and commercialization of university IPs.

Activities and Efforts:

Food and Tech Expo 2023:

Organized by CSUCC RDE and ITSO on November 30, 2023, the expo showcased a diverse range of faculty-and-student created food and technologies. TTLO actively evaluated the presented food items, contributing to identifying potential technologies for commercialization. Beyond its immediate impact, the expo provided a platform for CSUCC RDE to promote its products, creating possibilities for future commercialization endeavors.



Discussions on Term Sheets:

TTLO engaged in discussions with CSUCC ITSO Head and CSU TBI Director related to the preparation of Term Sheets, signaling a strategic approach to formalizing agreements. The ongoing discussions suggest an intent to streamline collaboration processes, a critical aspect of technology transfer and commercialization.



IP Education

- IP Seminar (Taligaman) November 17 - 44 participants;
- Basics of Intellectual Property: November 25 - 20 Participants

Other Trainings/Seminars Attended

- RAISE Program Proposal Writeshop
- Bukidnon State University Virtual Benchmarking Activity
- Patent Drafting and Patent Search Training Workshop with NEMSU
- En Banc of the RAISE Program
- Orientation and Action Planning Workshop for CIPC and TE
- University-wide Strategic Planning Workshop using Futures Thinking and Scorecard
- Orientation on Technology Business Incubation and Intellectual Property Rights (IPR)
- DOST Caraga's TechReady 2023 Training Workshop
- From Ideas to Assets: Harnessing the Value of Intellectual Property for Businesses
- Patent Mining Report Presentation of TTLO OJTs
- Seminar Series: Intellectual Property & Patent Search

Externally-funded projects

Project/ Program	Approved Budget	Remarks
Project 1. Regional Intellectual Property and Technology Business Management (IP-TBM) in Caraga through the RAISE Program	2,412,950.00 (Year 1)	Funds not yet downloaded (As of Nov. 30, 2023 - DV#4819 is prepared)
Project 4. Establishment of Regional Knowledge Management (KM) Hub in Caraga through the RAISE Program	1,342,000.00 (Year 1)	Budget released on Nov. 14, 2023 LDDAP-ADA no. 011011101-11-1105-2023

Proposed Activities

- Crafting of TTLO Five-year Developmental Plan
- Formulation of Operation Manual for CSUCC FTBI 'DAGCoTi' in collaboration with CSUCC Alumni
- Hiring of a Technical Expert who focused on Drafting IP Applications



Research and Development Publication Office

Progress of Current Projects

Q1 (Jan-Mar): Acceptance of submissions and review

Q2 (April-June): Online Release of JESEG & JASSH

Q3 (Jul-Sept): Acceptance of submissions and review

Q4 (Oct-Dec): Online Release of JESEG & JASSH

The Journal of Ecosystem Science and Eco-Governance is pleased to introduce a valuable addition: **POLICY BRIEFS**, a new article type aimed at facilitating meaningful engagement between researchers and policymakers, especially concerning studies with direct policy implications.



Policy Brief Submission

Satellite Remote Sensing for Industrial Tree Plantation Mapping and Monitoring: Way Forward for the Philippine ITP Industry” (Engr. Jojene R. Santillan)

JESEG December 2023 Issue Status

14 submissions:

- 1 desk rejection
- 8 waiting for authors' revision
- 1 ongoing galley proofing
- 2 ongoing review
- 2 sent request letter to reviewers



jASSH December 2023 Issue Status

6 submissions:

- 1 galley proofing status
- 2 to be checked by assoc ED
- 1 waiting for author revision
- 2 waiting for a reviewer



Navigatu Technology Business Incubator

Linkages and Partnerships

On November 9, 2023, the CDOBites, the Technology Business Incubator of the University of Science and Technology of Southern Philippines-Cagayan de Oro visited the Navigatu TBI facility to conduct a benchmarking activity. A fruitful exchange of best practices and strategies highlighted the visit of the CDOBites team composed of Engr. Christian Rey Alison, Engr. Ronelle Pabellan, and Ms. Shandy Pañares. The Navigatu TBI team gained valuable insights into the incubation program and the strategies employed by CDOBites. On the other hand, CDOBites acknowledged the unyielding efforts of the Navigatu TBI in advancing the Startup, Entrepreneurship, and Innovation ecosystem in the University and in the region. Present during the visit are Incubation Project Head, Ms. Jenelyn R. Asis, and Community Development Project Head, Mr. Edwin Manuel M. Jarlata. Also present during the visit is Mr. Jirby Jake Laniton, Coordinator of CET of USTP-CDO



Other Linkages and Partnerships





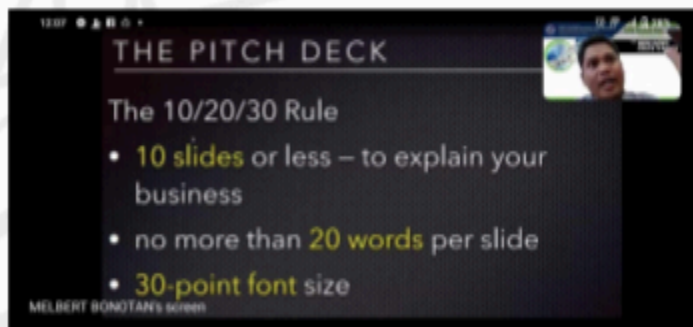
Navigatu Technology Business Incubator

Linkages and Partnerships

The last quarter of year at Navigatu is highlighted by several conferences, summits, and trainings. One of which is the 8th Mindanao ICT Cluster Conference where the Incubation Project Head of Navigatu, Ms. Jenelyn R. Asis was invited to speak about WHWise (Women Helping Women: Innovating Social Enterprise Program). WHWise is a program run by DOST where Ms. Asis served as one of the mentors of the national finalists and representative of the Caraga region.

Ms. Asis talked about the role of Navigatu in helping the MSMEs in the region realize the importance of being able to address the needs and wants of the customers to enable entrepreneurs to properly position themselves and their enterprises to gain traction.

Prof. Melbert R. Bonotan, MSc., was invited as the resource person of North Eastern Mindanao State University-College of Information Technology Education **Technofair**. The director delivered a talk about Crafting and Delivery of Pitch and Hackathon.



The Director also graced the Journey in Venture Financing in Entrepreneurship, a talk for The Entrepreneurial Mindset students in Caraga State University-Cabadbaran Campus on October 23, 2023. This talk was aimed at equipping both students and faculty in appreciating entrepreneurship as an opportunity to earn income and become an entrepreneur,



Navigatu Technology Business Incubator

Consultancy Services and Speaking Engagements



The Technofair was later on followed by the NEMSU KA-VIBES TBI Faculty Bootcamp held at Cagwait, Surigao del Sur from October 25-27, 2023. This bootcamp aims to teach faculty on Tech101 and craft the Tech101 syllabus and course guide, orient the faculty on the proper protocols in Technology Pitching and Pitching Competition, and to train faculty members in technopreneurship and share students' incubation program best practices.

The NEMSU Faculty Bootcamp was conducted in collaboration with CDOBites and Navigatu, Technology Business Incubators from University of Science and Technology of Southern Philippines-CDO and Caraga State University.

On November 8-9, 2023, TBI Director, Prof. Melbert R. Bonotan, MSc was invited as one of the resource speakers for the Women Helping Women: Innovating Social Enterprises (WHWise): Accelerating Innovation and Inclusive Entrepreneurial Ecosystem for Women in Caraga. The series of training and workshops led by the director was aimed at capacitating women entrepreneurs on Marketing and Business Mindsets, Designing of Business Model and Value Proposition Canvas, and Segmentation, Targeting and Positioning. The TBI Director was joined by the RAISE ATBI Project Development Office, Mr. Elpedio Corbeta, also as one of the resource speakers.

TRAINING, SEMINARS, AND WORKSHOPS CONDUCTED/ATTENDED

On October 4, 2023, the Office of the Vice President for Research, Innovation, and Extension and the Office of Planning and Development jointly organized a Research Proposal Workshop. The main objective of the workshop was to update the Public Investment Program (PIP) for the upcoming Fiscal Year 2025. The workshop was designed to provide a platform for researchers to present their proposals and ideas for potential funding. Participants had the opportunity to engage with experts from various fields, including Gender and Development.

The event was attended by the Research Center Directors and College Extension Coordinators. The workshop was an excellent opportunity for researchers to showcase their work and contribute to the development of the PIP.

A total of thirty-five (35) research proposals were submitted for funding, all of which were from the Social Sectors and Advancement of Science and Technology, Research and Development, and Innovation.



Faculty Researchers attended the deepening sessions on Gender Equality

In a proactive effort to campaign in ending the Violence Against Women (VAW) and to mainstream gender and development, the Caraga State University-Main Campus' Gender and Development (GAD) Office organized a two-day training session on Gender Awareness and GAD Tools (HGDG).

The workshop was attended by the university's GFPS members and faculty researchers who play pivotal roles in various research and academic endeavors. The training took place at Caraga State University-Main Campus on December 11-12, 2023, from 8:00 am to 5:00 pm, spanning two full days. To provide expert insights, a resource speaker from the Commission on Human Rights, Mr. Oliver Salino, was invited to discuss the Building Blocks of Gender Analysis and the application of the Harmonized Gender and Development Guidelines.



The objective of these sessions was to foster an equitable, safe, and dignified working environment for all university stakeholders, including staff, program beneficiaries, families, and community members. This was achieved by examining existing processes within the university, with a particular focus on gender awareness and GAD tools.





**Center for Research in Environmental Management and Eco-Governance
(CRÈME)**

Provision of Technical Assistance on the Formulation and/or Updating of the Risk-Informed Comprehensive Development Plans

The CSU Center of Research for Ecosystem Management and Eco-governance (CRÈME) assisted the select Local Government Units in the region in updating its Comprehensive Development Plans. Several activities conducted including the Orientation and Action Planning were delivered. The series of technical assistance ran from July to October 2023 with the assistance of certified environmental planners, planning officers, and technical experts from DILG and LGUs. A total of 12 activities were conducted for the said technical assistance which started with a consultation or integration meeting with the invited partners from DHSUD and CSU.



Short-term training program for the preparation of a risk-informed comprehensive development plan of LGU Tubay, Agusan del Norte

The Local Government Unit (LGU) of Tubay, Agusan del Norte requested a short-term training program for the preparation of a risk-informed comprehensive development plan. This short training course was talked over with DILG Regional Office 13 sometime in October of this year. Caraga State University (CSU), being an academic institution, possesses the necessary personnel and technical expertise to provide its services in the development and packaging of the Risk-Informed CDP.

The training method is a mix of online and in-person sessions. The blended seminar is set for November 28th through November 30th, 2023. CDP+ output was presented and criticized on December 18 and 19, 2023. LGU-Tubay is required to pay a training fee of P 74,000.00, which will be utilized to cover various expenses such as the training kit, honorarium for resource speakers, training assistant, and incidental costs.



Project Completion: Biological Profiling of Critical Watersheds (Baoy, Cambuayon, Can-Agtiw, Agas-as) of Surigao del Norte

The generation of up-to-date data on the biodiversity conditions of the watersheds through a comprehensive biological survey could serve as the basis for formulating conservation strategies and as a crucial step toward the declaration of a local conservation area.

The objective of the study is to provide baseline information on the presence of ecologically significant forest species and the general condition of three critical watersheds located in the Baoy Catchment Area in the municipalities of Claver, Gigaquit, and Bacuag, Mt. Can-agtiw in Tinago, Malimono, and the Laurel Catchment Area in Taganaan, Surigao del Norte. Bioprofiling the local flora and fauna can help us assess the quality and vitality of each watershed.

The surveyed critical watersheds in Surigao del Norte harbor a rich diversity of floristic species, amounting to 424 identified species. This remarkable array of flora plays a vital role in safeguarding the water quality within each watershed, effectively acting as a natural filtration and buffer system for the water.

This profiling could serve as baseline data for developing an effective conservation effort in collaboration with local governments, DENR, researchers, and other stakeholders. This project will result in the designation of critical watersheds as Local Conservation Areas, which will generate multiple benefits, including the effective conservation of globally threatened species, forests with high conservation value, and a reduction in deforestation and degradation. This initiative complements the objective of delineating the remaining forested land areas of Surigao del Norte and sustaining their use, thereby protecting the area and its biodiversity.

The Caraga State University (CSU) Center for Research in Environmental Management (CREME) conducted the above profiling in collaboration with the Surigao Economic Development and Microfinance Foundation, Inc.



Center for Renewable Energy, Automation, and Fabrication Technologies (CRAFT)

2-day Control System Training and Workshop for the technical personnel from Equiparco Construction Company (EPCC)

The Center for Renewable Energy, Automation, and Fabrication Technologies (CRAFT) at Caraga State University recently organized a two-day training and workshop on Control Systems. The event took place at the Mechatronics Laboratory Room in Hinang Hall and was meant for Equiparco Construction Company's (EPCC) technical personnel. The initiative was a collaborative effort between CRAFT and EPCC, bringing together the expertise of the university and the industry knowledge of the construction company. This partnership demonstrates the potential synergy between academic institutions and private enterprises.

The discussion is centered on various topics related to Control Systems such as the Introduction to Control Systems, Block Diagramming in Control Systems & SFG, Exploration of Instrument Society of America (ISA), and a Workshop on Tank Level Control Systems. This collaboration between CRAFT/DECE and EPCC aims to enhance the participants' control systems skills. It fosters innovation in the construction industry through theoretical insights and practical workshops. The faculty members from the Department of Electronics Engineering are leading this training program.



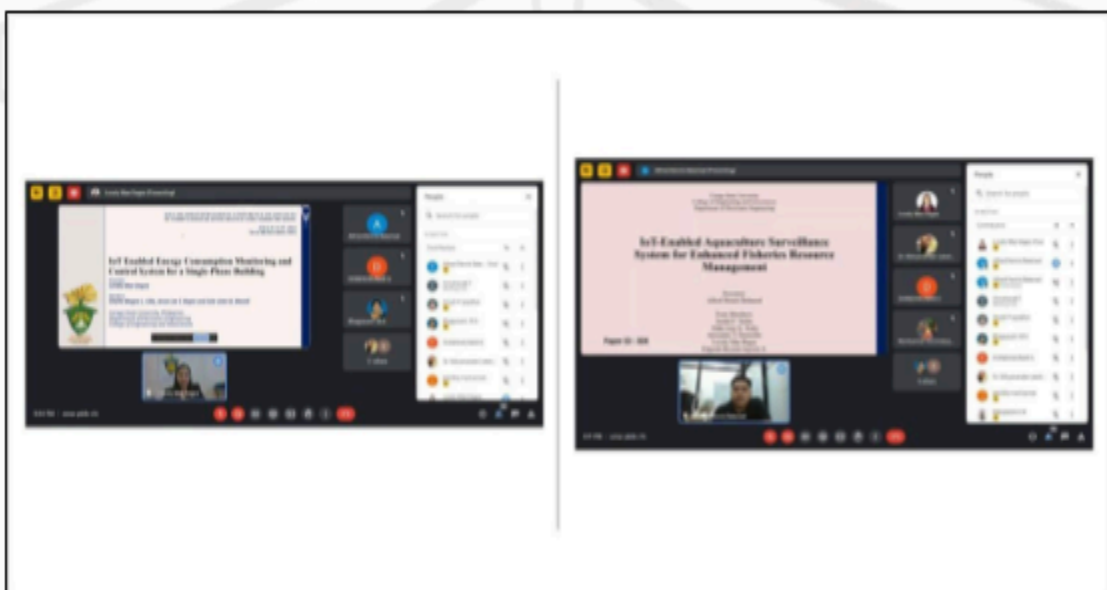


**Center for Renewable Energy, Automation, and Fabrication Technologies
(CRAFT)**

PAPER PRESENTATION 1

Two DECE faculty members, **Engr. Lovely Mae Dagsa** and **Engr. Alfred Dennis Balamad** participated in and successfully presented their research studies at the IEEE Second International Conference on Advances in Computational Intelligence and Communication (IEEE ICACIC-2023). The conference took place online on December 7-8, 2023, and was organized by Puducherry Technological University in India. The presented papers will be officially published at IEEE Xplore (which is Scopus-indexed).

- **IoT Enabled Energy Consumption Monitoring and Control System for a Single-Phase Building** (Authors: Engr. Lovely Mae Dagsa, Engr. Charle Magne L. Cillo, Jessa Lee T. Raper, Joie Lister B. Montil)
- **IoT Enabled Aquaculture Surveillance System for Enhanced Fisheries Resource Management** (Authors: Dr. Alexander T. Demetillo, Engr. Alfred Dennis B. Balamad, Engr. Edgardo Ricardo B. Sajonia Jr., Engr. Lovely Mae Dagsa, Nikki Jane G. Tudio, Joedel C. Solite)





**Center for Renewable Energy, Automation, and Fabrication Technologies
(CRAFT)**

PAPER PRESENTATION 2

Dr. Jeffrey T. Dellosa, a Doctor of Engineering graduate from Ateneo de Davao University, presented his paper entitled “Development and Implementation of Monitoring, Control and Battery Charging Systems for the 2.8 kWp FSPV System Prototype” during the International Association of Jesuit Engineering Schools (IAJES) held at the Ateneo de Davao University in Davao City on December 1-2, 2023.

The International Association of Jesuit Engineering Schools (IAJES) is a global network of engineering schools and programs associated with Jesuit educational institutions. Its primary focus is fostering collaboration and sharing best practices among Jesuit engineering schools worldwide. Many Jesuit engineering schools prioritize projects and research that contribute to sustainable development and positive social impact, aligning with the broader mission of Jesuit education.

Ateneo de Manila University, Ateneo de Davao University, Ateneo de Zamboanga University, Ateneo de Naga University, and Ateneo de Cagayan or Xavier University are among the Jesuit academic institutions in the Philippines participating in the said conference. Other popular Jesuit academic institutions include Georgetown University, Sta. Clara University, and Gonzaga University among others in the US.

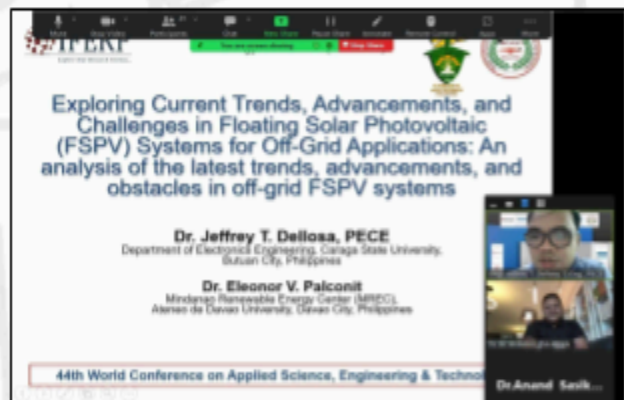


**Center for Renewable Energy, Automation, and Fabrication Technologies
(CRAFT)**

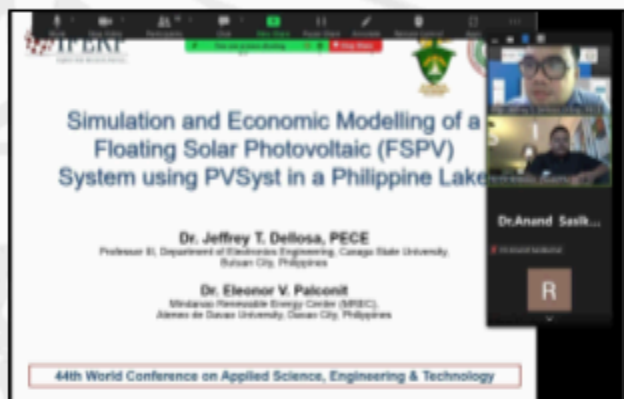
PAPER PRESENTATION 3

Dr. Jeffrey T. Dellosa continues to shine as a beacon of innovation in solar energy, presenting two groundbreaking studies at the 44th World Conference on Applied Science Engineering and Technology.

In his presentation titled "Exploring Trends in Off-Grid Floating Solar Photovoltaic Systems," Dr. Dellosa offered unparalleled insights into the challenges, advancements, and trends in this field. His expertise illuminated the potential of off-grid FSPV systems, highlighting their pivotal role in sustainable energy solutions.



Additionally, Dr. Dellosa presented "Simulation and Economic Modeling of a Floating Solar Photovoltaic System using PVSyst in a Philippine Lake," a study that exemplified his dedication to practical applications. This paper showcased the economic viability and simulation aspects of an FSPV system in a Philippine lake, demonstrating its feasibility as a sustainable energy solution.



This paper won the Best Paper during the conference.

The Department of Electronics Engineering proudly celebrates Dr. Dellosa's exceptional achievements. His research not only advances scientific knowledge but also paves the way for practical, sustainable solutions that benefit our global community.



**Center for Renewable Energy, Automation, and Fabrication Technologies
(CRAFT)**

PAPER PRESENTATION 4

Engr. Alfred Dennis Balamad, a faculty member of the Department of Electronics Engineering, has been granted the privilege to present his research output at the prestigious international conference at the IEEE Region 10 Conference (TENCON), Chiang Mai, Thailand from October 31 to November 3, 2023. This remarkable opportunity allows Engr. Balamad to present his thesis output in Master of Science in Electrical Engineering which he has recently completed at MSU-IIT through a DOST-ERDT scholarship program. This study was collaboratively authored with MSU-IIT researchers.

The department takes great pride in this achievement, underscoring its commitment to faculty development through academic presentations and active engagement in research and innovation.



CENTER'S ON-GOING PROJECT:

Design and Development of a Monitoring System for Floating Solar Photovoltaic System through a Wireless Sensor Network

Mathematical and Statistical Computing and Research Center (MSCRC)

Math dept invites prof emeritus from France for volunteer lecturer course

Caraga State University hosted a Volunteer Lecturer Course on 'Data Assimilation and Machine Learning for Environmental Problems' with Professor Emeritus Mark Asch from the Université de Picardie Jules Verne in France. This initiative marks a significant stride towards global academic cooperation.

Faculty members and graduate students from the university, as well as those from other esteemed institutions such as Mindanao State University (MSU) Main and Iligan Institute of Technology, and Agusan del Sur State College of Agriculture and Technology (ASSCAT), were invited to participate from October 9 to October 19, 2023.

The course delved into the intersection of data assimilation and machine learning, offering valuable insights into addressing environmental challenges through cutting-edge technologies. With a focus on practical applications, participants gained hands-on experience and theoretical knowledge that could potentially contribute to sustainable solutions for environmental issues.



The presence of Professor Mark Asch, an eminent figure in the field, added a distinguished touch to the course, further emphasizing the importance of global partnerships in advancing education and research. Faculty members and graduate students engaged in interactive sessions, discussions, and collaborative projects, creating a platform for the exchange of ideas and the exploration of innovative approaches to environmental problem-solving. As they return to their respective institutions armed with new knowledge and perspectives, the impact of this international collaboration is expected to resonate in research and initiatives addressing environmental challenges in the Philippines and beyond.

This Volunteer Lecturer Program was established by the International Mathematical Society (IMU) - Commission for Developing Countries. By giving institutions in developing nations financial support to host a volunteer lecturer for an intensive course, it aims to promote research and international interaction between mathematicians in developing nations and the global mathematical community.



Mathematical and Statistical Computing and Research Center (MSCRC)

Basic Statistical Training and JASP Software Application Workshop

Selected faculty members from the different colleges of Caraga State University are diving deep into statistical insights on November 29, 2023 to December 1, 2023.



CENTER'S Project Expected for 2024:

1. The Development, and Pilot-Testing of a Community-Tailored Shared Decision-Making Intervention
2. Digital Twins for Environmental Modeling and Smart Cities – Training Program under Researchers on Industry, Energy Emerging Technologies - Opening Opportunities for Learning (RIEETOOL)

ACTION TOWARDS GREATER ADVANCEMENT OF KNOWLEDGE (AGAK)

The fourth quarter of 2023 marked a period of significant milestones and achievements for our center. Throughout this period, our team dedicated its efforts towards several key initiatives, including the thorough evaluation of research project proposals, active participation, and successful execution at the LIKHA Summit, and our presence at the esteemed NRCP Convention. These endeavors exemplify our commitment to fostering innovation, advancing research excellence, and actively contributing to the scientific community. This report aims to highlight the accomplishments and strides made during this crucial quarter, showcasing the dedication, expertise, and impactful contributions of our center's team members.

Evaluation of Research Project Proposals

On October 18, 2023 the Center spearheaded an evaluation of research project proposals at Multi-Media Center, Old CEIT building of Caraga State University. The proceedings were initiated by Ms. Apple Jane Lima, Instructor 1 of CSU-CED, who skillfully hosted the event. The session commenced with a solemn prayer, followed by a multimedia presentation of the National Anthem. Dr. Rissa Mercado, the associate dean of CEEd, delivered the opening remarks, setting the tone for the day's deliberations. Dr. Gladys L. Lagura then provided a comprehensive rationale for the program, shedding light on its significance. A heartfelt message resonated through the venue as Dr. Jeffrey T. Delosa, the Vice President for Research, Innovation, and Extension, shared his insights with the audience. Ms. Evelyn B. Ballenas, a faculty member of CEEd, took the stage to introduce the esteemed panel of evaluators. The panel comprised Dr. Jeffrey T. Dellosa (Vice President for RIE), Dr. Sherryl L. Paz (Research Director), and Mr. Mark Vincent G. Vergara (CCPD Director). Following the formal introductions, the spotlight shifted to the heart of the event—the project proposal presentations. Each proposal was meticulously presented in the following order:

Title	Proponent
Bridging Education and Culture: Developing Contextualized Outcomes- Based Instructional Materials (CLOBIMs) for K-12 Education and Pre-Service Teachers	Glady L Lagura, EdD Grace T. Flores, EdD Miraluna L. Herrera, PhD Alvic A. Arnado, PhD Emybel M. Alegre, PhD Joyce M. Suganob, EdD Ma. Gloria Liquido, EdD Leo L. Codilla, Jr., EdD
Case Study and eLearning Instructional Materials Analytics of the Field Study Course Implementation During Pandemic: A Lens for Hyflex Curriculum for Field Study Courses	Maris T. Lasco, Ed.D Nelia S. Raganas, PhD Leo L. Codilla, Jr., EdD Julie S. Berame, PhD Rissa L. Mercado, PhD Minie L. Bulay, PhD
Innovation in Education: Exploring Assessment and Design of LMS- Based Instructional Materials for General Education Courses	Grace T. Flores, Ed.D Miraluna L. Herrera, PhD Alvic A. Arnado, PhD Emybel M. Alegre, PhD Myron T. Cubillan Ma. Gloria Liquido, EdD

ACTION TOWARDS GREATER ADVANCEMENT OF KNOWLEDGE (AGAK)

Title	Proponent
Inspiring Young Explorers: Promoting Effective Instructional Practices and Innovations in Early Childhood Education	Marichu Tulang, Ed.D Leo L. Codilla, Jr., EdD Cristina A. Cubillas, EdD Charito C. Rodriguez, EdD Lita Bolivia, EdD Lourdes Bago, EdD Fe Dela Cruz, PhD
Cultivating a Sustainable Future: The Synergistic Impact of Contemporary Teaching and Learning On Education, Environment, and Health Education	Julie S. Berame, PhD Charito C. Rodriguez, EdD Rissa L Mercado, PhD Minie L. Bulay, PhD Cristina A. Cubillas, PhD
Adapting Education to the New Normal: Exploring Academic Issues, Coping Strategies, and Enhancing Literacy and Numeracy Skills	Trixie E. Cubillas, PhD Ariel U. Cubillas, PhD Gladys L. Lagura, EdD Leo L. Codilla, Jr., EdD Grace T. Flores, EdD



For the year 2025 funding, our center undertook a proactive initiative by submitting project proposals to the Department of Budget and Management (DBM) under two significant research programs: the RESILIENT research program and the Outcomes-based Instructional Design and Development (ObIDD) research program. Under the RESILIENT research program, our center passionately crafted six (6) proposals that focused on resilience-building measures across various sectors aligned with the demands of the present educational environment.



CARAGA CENTER FOR PEACE AND DEVELOPMENT (CCPD)

Attendance to Trainings and Conferences

Conference 1

The DOST-PCHRD conducted the activity titled “Introduction to Evidence-Informed Policy Messaging and Policymaking for Health Workshop” on October 18-20, 2023. Various researchers across the regions of the Philippines attended this. This was held at Savoy Hotel, Pasay City.

The key highlight of the activity is the making of policy briefs and presentations of outputs based on various research projects. These outputs are targeted to be utilized by different government agencies, i.e. DOST and DOH. Caraga Health Research and Development Consortium (CHRD) was represented by Mr. John Albert M. Quijano, a faculty of Caraga State University – College of Humanities and Social Sciences. He presented the policy research output of their project titled “Factors Contributing to Contraceptive Use and Non-use among Women of reproductive age in the Caraga Region.”



Conference 2

The Caraga Health Research Development Consortium (CHRD) conducted its 6th Caraga Health Research and Development Convention. This was held at Caraga State University – Main Campus HERO Learning Commons. The key highlight of this activity is to present the research results from various studies and their application for community health development through policy interventions and innovations.





CARAGA CENTER FOR PEACE AND DEVELOPMENT (CCPD)

Attendance to Trainings and Conferences

Training/Webinar



The Northeastern Mindanao State University – Education Graduate School conducted research capacity activity to equip their graduate students with various methodologies and approaches to conducting research. The activity was themed “Enriching research

knowledge:

Community-based research approaches in response to RDP 2023-2028.

The activity was attended by participants from various institutions i.e., CSU graduate students, NEMSU graduate students, etc. The activity highlighted the importance of the i2FAME framework and a community-based research approach in selecting a research topic. Supplemented by highlighting the importance of knowing the research project outputs and their significance to the community.

Moreover, the center will hold an approved activity on project proposal writeshop on December 18, 2023. The focus of this activity is to delve deeper into effective strategies and techniques for acquiring grants from various prospective funders.

**Center for Nanoscience and
Technology for Research and
Entrepreneurship (CeNTRE)**

Attendance to Trainings and Conferences

In vision to provide a venue to gain more insights particularly in the fabrication and application of nanomaterials for sensor development the Project funded by CHED-LAKAS: Development of Paper-based Colorimetric Sensor Utilizing Varied Sizes of Gold Nanoparticles for Rapid and On-site Detection of Various Meat Products Spoilage, attended the Meat Assessment Sample Preparation and Sensor Development on November 13-17, 2022 at De La Salle University Laguna Campus; Site visitation, Observation of Hog Slaughtering & Meat Processing at Tarlac Philmico Good Meats Corporation, Tarlac City on November 20-21, 2023.



Center's Contract Research:

Project Title: Minesite Airborne Particulates Matter Measurement and Monitoring
Partner Agency: Libjo Mining Corporation, Municipality of Tubajon, Dinagat Islands
Internal Collaborators: MinRES, CreATE, CCPD Status: On-going
Duration: 7 mos. (October 2023 – March 2024)



CENTER OF HUMAN AND COMPUTER INTERACTION (CHCI)

Project Update under CHCI

PROGRAM TITLE: *Sustainable Mineral and Mining Operations using Industry 4.0*

PROJECT TITLE: *Project 3: Industry 4.0 Learning Factory for Mining Engineering and Geology in the Academe and Mining Industry using Augmented Reality and Virtual Reality Technologies aka MARVEL Technologies*

MARVEL Technologies aims to develop augmented and virtual reality for the anatomy of a mine, mine safety training and drills (mine emergency rescue and evacuation), and mining machine operations like the jumbo drilling machine and others. The delivery of training and instruction for mining education has largely remained traditional. This project aims to bridge this gap through a Digital training room making use of Virtual Reality (VR) and Augmented Reality (AR) to train students, engineers, and practitioners. Augmented Reality (AR) or Virtual Reality (VR) is one technology that can be useful in implementing the training needs for various mining activities. It enables the training for high-risk scenarios such as fire events and simulating specialized equipment. In principle, it is possible to place the individual in a virtual immersion of real-life scenarios, making the training independent of location

Financial Report

As of December 11, 2023, the fund utilization percentage is 46.45%. The total amount shown in the table below is based on the total released approved budget to CarSU, which differs by intended for the DOST-PCIEERD Indirect Cost as stipulated in the approved line-item budget

Technical Accomplishments

- Replication of APEX Minesite
- Safety in Mine Environment Modeling and simulation
- Conduct of Mine Safety Training
- Development of Multiplayer system of the AR/ VR Technology
- Player Prefab
- Development of DashBoard

Research Preparation

In a milestone achievement, the team successfully submitted a comprehensive research paper titled "Low-Cost Mobile-Based Augmented Reality Viewer: Bridging the Gap Between Affordable AR Glasses and Smartphones" to the ICNCC 2023. This significant contribution underscores the team's commitment to advancing the field of augmented reality by proposing an innovative solution that addresses the accessibility gap between affordable AR glasses and smartphones.



CENTER OF HUMAN AND COMPUTER INTERACTION (CHCI)

The culmination of their research efforts is scheduled to be presented online on December 17, 2023, during the ICNCC conference as shown in [Figure 8](#). This accomplishment reflects the team's dedication to sharing valuable insight and contributing to the academic discourse surrounding augmented reality technology in the digital realm.

Schedule for Presentation of Research Paper

The paper, titled "Low-Cost Mobile-Based Augmented Reality Viewer: Bridging the Gap Between Affordable AR Glasses and Smartphones," is scheduled for presentation during the ICNCC 2023 conference. The presentation is slated to take place on December 17, 2023, from 16:45 to 17:00 Japan time.

This visual representation underscores the significance of the team's contribution, providing a specific and scheduled platform for sharing their research findings with the academic community during the specified time frame at the conference.

Online Session 3
Intelligent Image Analysis and Processing
Chair: Yong Cao, Yellow River SAT College, China
16:30-16:30, Sunday, Dec. 17 (GMT+9)
Meeting ID: 868 6268 5483 <https://us2.zoom.us/j/86862685483>

N4018
16:30-16:45
Leveraging Graph Databases for Automated OPC UA Information Model Construction
Ronglong Yu, **Mr. Yaoyi Zhong**, Yunliang Xu, Jie Wen, Quanfeng Pan, Wenti Shi, and Zhan Wang
Zhejiang Energy Digital Technology Co., Ltd, China
Abstract:
To address the OPC UA transformation requirements of conventional factory data collection systems, we propose an innovative method for the automated construction of OPC UA information models utilizing graph databases. This method not only streamlines the process but also minimizes the need for extensive manual labor and specialized expertise. Drawing from the resemblance between OPC UA information models and OWL ontologies, we have devised mapping rules that facilitate the translation of knowledge graph data into OPC UA format. Leveraging the existing Neo4j database within the factory as the primary information source, we've developed an OWL ontology construction module for exporting ontology files. In parallel, an information model construction module has been designed to convert the ontology file into an OPC UA XML file, complete with the OPC UA information model. This XML file adheres to the official OPC UA specification, ensured through the use of the UA-ModelCompiler tool. To validate the effectiveness and viability of this construction method, we conducted functional tests and evaluations using a publicly available database. The results of these tests confirm the feasibility of our approach, marking a significant advancement in OPC UA information model construction for factory data systems.

N00341
16:45-17:00
Low-Cost Mobile-Based Augmented Reality Viewer: Bridging the Gap Between Affordable AR Glasses and Smartphones
Mr. Kent Tugade Espejon, Jaymer M Jayoma, and Elbert Simudan Moyon
Caraga State University, Philippines
Abstract:
This research project aims to enhance the accessibility of Augmented Reality (AR) technology by developing a low-cost mobile-based AR viewer. The study delves into the hardware and software setup, conducting a comprehensive feature analysis of both the mobile-based AR viewer and traditional AR glasses. Emphasizing the accessibility advantages inherent to the mobile-based AR viewer while candidly acknowledging its limitations, the research also explores the broader implications for AR technology adoption and outlines strategies for future improvements in this evolving field.



CENTER OF HUMAN AND COMPUTER INTERACTION (CHCI)

Publication

One (1) research paper, "A Region-Based Point Cloud Down Sampling Technique for Scene Rendering Augmentation of Synthetic 3D-Modeled Objects" is already published in the ACM Digital Library

Patents

The project team is currently conducting inquiries to understand the processes for submitting a patent or utility model grant request. This phase includes researching the patent landscape and reviewing intellectual property rights to prepare a comprehensive application, increasing the chances of securing the desired protection for their invention.

Product

- Developed 124 3D-modelled objects
- Developed a wristband for the anatomy of a Mine AR Technology Controls
- Stages of a Mine AR/VR Technologies

People Services

- Three (3) BSCS students conducting a thesis titled "CPU Optimized Ramer- Douglas-Peucker Algorithm for Visual on Time Series Data"
- Four (4) on-the-job trainees at MARVEL Technologies
- Three hundred (300) Philippine Science High School Students served and trained with basic 3D modeling during their science and technology appreciation field visit to Caraga State University

Places and Partnerships

- meetings with the Apex Mining Company, Inc., and Taganito Mining Company
- two (2) mining companies, i.e, Apex Mining Company, Inc., and Taganito Mining Company, have committed to adopting MARVEL Technologies
- Caraga Regional Science and Technology Week 2022 project exhibit
- Courtesy meeting with the University of Southeastern Mindanao, Obrero Campus' College of Engineering

Policies

The ongoing policy development for integrating AR/VR Technology into the Mining Engineering curriculum aims to enhance learning experiences. As a prerequisite for field exposure, immersive technologies will simulate real-world mine scenarios, ensuring students acquire vital skills and knowledge efficiently and safely before entering the field.



Caraga Center for Agricultural Research and Entrepreneurship (Caraga CARE)

Project Update under Caraga CARE

Research Projects or Programs	Year of Implementation	Year of Completion	Approved Budget Allocation	Obligations	% Funds Utilization	Date for Utilization Update
BIOCHARTILANT - 3: On-farm Multi-location Evaluation on Soil Fertility, Microbiota Diversity, Incidence and Severity of Soil-borne Diseases, and Yield Productivity of Tomato and Bitter Gourd in Organic Vegetable Production	2023	2023	4,280,747.24	3,876,407.90	90.55	Dec 1, 2023
Towards Management of Abaca Virus Diseases Using Sensitive Tools: Updating Nature of Diseases and Incidence.	2023	2024	2,897,816.22	1,397,671.85	48.23	Dec 1, 2023

Trainings conducted

No	Title	Date
1	CAA-LIFE (Livelihood Improvement through Facilitated Extension): Training on Free-Range Native Production and Management	November 8, 2023
2	Addressing Virus Diseases in Abaca Production: A Status Update and Comprehensive Training on Production and Disease Management	October 18, 2023
3	Addressing Virus Diseases in Abaca Production: A Status Update and Comprehensive Training on Production and Disease Management	November 15, 2023
4	Addressing Virus Diseases in Abaca Production: A Status Update and Comprehensive Training on Production and Disease Management	November 16, 2023
5	Training on Biochar Production and Soil Health Management	November 17, 2023
6	Training of Enumerators for the Impact Assessment of the Project "Strengthening Urban Agriculture: A Strategy for Ensuring Food Availability amidst the Threat of CoViD-19 in the Caraga Region"	December 6, 2023
7	Focus Group Discussion for the Impact Assessment of the Project "Strengthening Urban Agriculture: A Strategy for Ensuring Food Availability amidst the Threat of CoViD-19 in the Caraga Region"	December 6, 2023
8	Training on Spray Drying Technology and Flour Processing (Non-wheat)	October 17, 2023
9	Skills Training on Lotus Seeds Processing	November 28, 2023
10	Training on Operation and Maintenance of Vacuum Fryer, Spray Dryer, and Water Retort	November 30, 2023
11	Skills Training on Cucumber Processing	December 6, 2023

Mineral Resources Management Research and Training Center (MinRes)

On-going Projects under MinRes

- Minesite Airborne Particulates Matter Measurement and Monitoring Project. Funded by Libjo Mining Corporation (LMC). (This project is co-implemented by NanoCentRE, CREATE, and CCPD).
- Household Socio-Economic and Livelihood Assessment for the Host Barangays of PNPI. Funded by Pacific Nickel Philippines, Inc (PNPI).
- Selective Electrochemical Detection of Mercury Ions using PEDOT-wires Functionalized on Silica Nanochannels. Funded by DOST-PCIEERD.
- Facile Synthesis of Smart Thermo-responsive Sago Starch/Poly(N-isopropyl acrylamide) Hydrogels Crosslinked with Methacrylated-TiO₂ for Heavy Metal Valorization and Photocatalysis. Funded by DOST-PCIEERD.

Financial Update

Project/ Program	Approved Budget, Php	Obligated Php (%)	Remaining Balance Php (%)	Remarks
Minesite Airborne Particulates Matter Measurement and Monitoring Project	260,000.00	0.00 (0%)	260,000.00	Major activities will be conducted next year (2024)
Household Socio-Economic and Livelihood Assessment for the Host Barangays of PNPI	220,140.00	0.00 (0%)	220,140.00	to be implemented next year (2024)
Selective Electrochemical Detection of Mercury Ions using PEDOT-wires Functionalized on Silica Nanochannels	1,995,984.00	479, 665.50 (24%)	1,516,318.5 (76%)	Q1 done
Facile Synthesis of Smart Thermo-responsive Sago Starch/Poly(N-isopropylacrylamide) Hydrogels Crosslinked with Methacrylated-TiO ₂ for Heavy Metal Valorization and Photocatalysis	1,741,984.00	387,551.15 (23%)	1,354,432.85 (77%)	Q1 done



Caraga Food Innovation Center (CFIC)

Product Development Activities

Student's Output

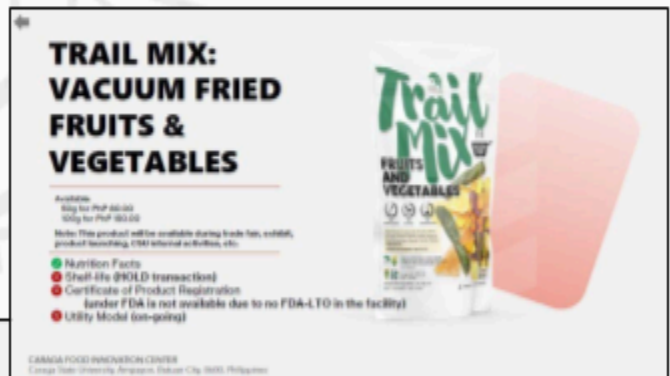
1. RTE Vegan Porridge
2. Vegan Patty
3. Vacuum Fried Spices
4. Freeze-dried Mixed Fruits
5. Dried Mango Coco

Requested products by DTI-AdN

1. Rice Flour
2. Mochi
3. Rice Chips
4. Puffed Rice
5. Coco Jam
6. Coco Pretzels

Contract Research & Development with DOST Caraga

1. Vacuum-fried Lotus Seeds
2. Ready to Drink Cucumber-Kalamansi Juice
3. Spray-dries Cucumber-Calamansi Juice
4. Cucumber Pickles



FINANCIAL

Bar chart showing Financial Performance (Revenue vs. Expenses) for various periods. Revenue is represented by red bars and Expenses by green bars. The chart shows a general upward trend in revenue over time, with a significant spike in the final period.

PERIOD	REVENUE	EXPENSES
2020-01-01	100,000.00	20,000.00
2020-03-31	120,000.00	25,000.00
2020-06-30	150,000.00	30,000.00
2020-09-30	180,000.00	35,000.00
2020-12-31	200,000.00	40,000.00
2021-03-31	250,000.00	50,000.00
2021-06-30	300,000.00	60,000.00
2021-09-30	350,000.00	70,000.00
2021-12-31	400,000.00	80,000.00
2022-03-31	450,000.00	90,000.00
2022-06-30	500,000.00	100,000.00
2022-09-30	550,000.00	110,000.00
2022-12-31	600,000.00	120,000.00
2023-03-31	650,000.00	130,000.00
2023-06-30	700,000.00	140,000.00
2023-09-30	750,000.00	150,000.00
2023-12-31	800,000.00	160,000.00
2024-03-31	850,000.00	170,000.00
2024-06-30	900,000.00	180,000.00
2024-09-30	950,000.00	190,000.00
2024-12-31	1,000,000.00	200,000.00
2025-03-31	1,050,000.00	210,000.00
2025-06-30	1,100,000.00	220,000.00
2025-09-30	1,150,000.00	230,000.00
2025-12-31	1,200,000.00	240,000.00
2026-03-31	1,250,000.00	250,000.00
2026-06-30	1,300,000.00	260,000.00
2026-09-30	1,350,000.00	270,000.00
2026-12-31	1,400,000.00	280,000.00
2027-03-31	1,450,000.00	290,000.00
2027-06-30	1,500,000.00	300,000.00
2027-09-30	1,550,000.00	310,000.00
2027-12-31	1,600,000.00	320,000.00
2028-03-31	1,650,000.00	330,000.00
2028-06-30	1,700,000.00	340,000.00
2028-09-30	1,750,000.00	350,000.00
2028-12-31	1,800,000.00	360,000.00
2029-03-31	1,850,000.00	370,000.00
2029-06-30	1,900,000.00	380,000.00
2029-09-30	1,950,000.00	390,000.00
2029-12-31	2,000,000.00	400,000.00
2030-03-31	2,050,000.00	410,000.00
2030-06-30	2,100,000.00	420,000.00
2030-09-30	2,150,000.00	430,000.00
2030-12-31	2,200,000.00	440,000.00
2031-03-31	2,250,000.00	450,000.00
2031-06-30	2,300,000.00	460,000.00
2031-09-30	2,350,000.00	470,000.00
2031-12-31	2,400,000.00	480,000.00
2032-03-31	2,450,000.00	490,000.00
2032-06-30	2,500,000.00	500,000.00
2032-09-30	2,550,000.00	510,000.00
2032-12-31	2,600,000.00	520,000.00
2033-03-31	2,650,000.00	530,000.00
2033-06-30	2,700,000.00	540,000.00
2033-09-30	2,750,000.00	550,000.00
2033-12-31	2,800,000.00	560,000.00
2034-03-31	2,850,000.00	570,000.00
2034-06-30	2,900,000.00	580,000.00
2034-09-30	2,950,000.00	590,000.00
2034-12-31	3,000,000.00	600,000.00
2035-03-31	3,050,000.00	610,000.00
2035-06-30	3,100,000.00	620,000.00
2035-09-30	3,150,000.00	630,000.00
2035-12-31	3,200,000.00	640,000.00
2036-03-31	3,250,000.00	650,000.00
2036-06-30	3,300,000.00	660,000.00
2036-09-30	3,350,000.00	670,000.00
2036-12-31	3,400,000.00	680,000.00
2037-03-31	3,450,0	



Caraga Center for Geoinformatics (CCGEO)

Product Utilization

NO	PRODUCT NAME / METHODS / PROCESS / TECHNOLOGY	PROOF	BENEFICIARY
1	Bayugan City Spatial Datasets	End-User License Agreement; Certificate of Utilization	Caraga State University (student)
2	RTR Spatial Datasets	End-User License Agreement; Certificate of Utilization	Caraga State University (student)
3	Butuan City DTM and DSM	End-User License Agreement; Certificate of Utilization	Caraga State University (student)
4	ADN Spatial Datasets	End-User License Agreement; Certificate of Utilization	Caraga State University (student)

Presentations

NO	TITLE	Authors	CONFERENCE
1	Spatio-temporal and Hydrological Analysis of Sambunotan Watershed, Dinagat Islands, Philippines	Arnaldo C. Gagula, Van Jovi C. Lofranco, Mary-Ann M. Pomoy, Stephanie Mae Salcedo-Albores	International Congress on Sustainable and Climate-Resilient Watershed Management through Ecosystem-Based Approaches in the Asia-Pacific Region.
2	Land-cover Characterization and Water Quality Assessment of the Sambunotan Watershed, Dinagat Islands, in Support of the Development of the Watershed Management Plan	Meriam Makinano - Santillan, Jojene R. Santillan, Arnaldo C. Gagula, Michelle V. Japitana, Stephanie Mae Salcedo-Albores	4th International Conference on INREM
3	Hydrological and Geologic Assessment of the Sambunotan Watershed for Sustainable Resource Management	Meriam Makinano - Santillan, Arnaldo C. Gagula, Jojene R. Santillan, Stephanie Mae Salcedo-Albores, Jun Love E. Gesta, Nichole Anthony Pacle, Riva Varela	4th International Conference on INREM
4	Remote Sensing and GIS-Based Development and Calibration of a Hydrological Model for the Sambunotan Watershed, Philippines	Stephanie Mae Salcedo-Albores, Jojene R. Santillan, Jun Love E. Gesta, Arnaldo C. Gagula, Meriam M. Santillan	44th Asian Conference on Remote Sensing (ACRS) 2023

5	SITE SUITABILITY ANALYSIS OF MATERIAL RECOVERY FACILITY IN CARAGA STATE UNIVERSITY USING GIS AND RS TECHNOLOGIES	Arturo G. Cauba, Wilson Sanawi	44th Asian Conference on Remote Sensing (ACRS) 2023
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Caraga Center for Geoinformatics (CCGEO)

Presentations

NO	TITLE	AUTHORS	CONFERENCE
6	MAPPING COCONUT TREES AND ITS PRODUCTION OF VIRGIN COCONUT OIL WITHIN BUTUAN CITY USING SENTINEL-2 DATA	Arturo G. Cauba, James Ian L. Jancinal and Jeremy B. Corvera	44th Asian Conference on Remote Sensing (ACRS) 2023
7	SYNERGY OF OPTICAL AND SYNTHETIC APERTURE RADAR (SAR) SATELLITE IMAGES FOR MAPPING POSTFLOOD RICE CROPLAND RECOVERY: A CASE STUDY - IN KITCHARAO, AGUSAN DEL NORTE PHILIPPINES	Arturo G. Cauba, Wesley Clifford T. Dispo, Pia Lauritz A. Bocboc, and Monalaine M. Bermoy	44th Asian Conference on Remote Sensing (ACRS) 2023
8	USING REMOTE SENSING AND GIS TECHNIQUES TO MONITOR AND ANALYSE LAND USE LAND COVER CHANGES IN BAYUGAN CITY	Arturo G. Cauba, Mark Lawrence D. Alonde	44th Asian Conference on Remote Sensing (ACRS) 2023
9	SPATIO-TEMPORAL SCALES OF LAND COVER AND SHORELINE DYNAMICS IN BANAYBANAY, DAVAO ORIENTAL USING AVAILABLE OPTICAL SATELLITE IMAGERY	Kendel P. Bolanio, Honey Jane Estilo, Laiza Grace Dugal, Romell Seronay	Philippine Geomatics Symposium 2023
10	Hydrological Analysis of Sambunotan Watershed, Dinagat Islands using Remote Sensing and GIS	Engr. Stephanie Mae Salcedo-Albores, Engr. Arnaldo C. Gagula, Engr. Jun Love E. Gesta, Engr. Meriam M. Santillan and Engr. Jojene R. Santillan	2023 Annual Research, Development, Innovation, and Extension In-house Review
11	Multisensor Drone-Directed Rice Plant Diseases Detection using Remote Sensing and GIS	Renardfel Plex Q. Peñaloga, Gerlon A. Farillon, Engr. Monalaine M. Bermoy, Engr. Jun Love E. Gesta and Engr. John Rudmark L. Ebo	2023 Annual Research, Development, Innovation, and Extension In-house Review
12	Application of GIS and AHP in Delineating and Mapping Coal Extent Prospect Areas in Surigao del Sur, Philippines	Nhesa L. Cabigquez, Jan Patrick G. Oropa, Ms. Riva Karyl P. Varela and Engr. Jun Love E. Gesta	2023 Annual Research, Development, Innovation, and Extension In-house Review
13	Utilization of UAS for Modeling and Assessment of Irrigation Canal	Edrian Celis, Jake Tagaro and Engr. Arnaldo C. Gagula	2023 Annual Research, Development, Innovation, and Extension In-house

			Review
14	DETERMINATION AND ASSESSMENT OF ADDITIONAL ROUTES FOR PUBLIC UTILITY VEHICLES IN BUTUAN CITY USING GIS-BASED NETWORK ANALYSIS	Arturo G. Cauba Jr., Julie Ann M. Ybañez	44th Asian Conference on Remote Sensing (ACRS) 2023

Center for Resource Assessment, Analytics, and Emerging Technologies (CREATE)

Papers Presentation

ABE faculty-researchers present research outputs in the 9th International Exchange and Innovation Conference on Engineering and Sciences (IEICES) 2023

Through the Center for Resource Assessment, Analytics, and Emerging Technologies (CRaTe), a total of ten (10) research and review papers were successfully presented by the affiliated faculty members of the Department of Agricultural & Biosystems Engineering (DABE) in the recently concluded IEICES 2023 organized by the Kyushu University – Interdisciplinary Graduate School of Engineering and Sciences (IGSES), Kyushu, Fukuoka, Japan on October 19-20, 2023, via Hybrid Conference Scheme.

The annual conference brings together academics, researchers, and students to share cutting-edge development in the fields of materials, energy, chemical, agricultural and environmental engineering & and sciences. Moreover, the IEICES is a FREE conference partially financially supported by the IGSES Kyushu University, and all the conference papers were subjected to a peer-review (single-blind) process. It can be noted further that the IEICES proceedings are indexed by Scopus since 2022.

The presented research papers are part of the data results of the completed research, development, and innovation (RDI) projects implemented by the center which are funded by the CSU Regular Agency Fund (RAF) FY 2022.





**Center for Resource Assessment, Analytics, and Emerging Technologies
(CREATE)**

Project Implemented

1. Development and Optimization of Cacao Processing Technologies (FLR-HERIP: Php 218, 500.00)
2. Economic Viability and Compressive Strength of Roller Compacted Concrete Pavement (RCCP)

Funds Utilization

Project Title	Approved Budget	Obligated	Remaining Balance	Percent Utilization
Development and Optimization of Cacao Processing Technologies	Php 218, 500.00	209,500.00	9,000.00	96%

Project Activities

1. Conducted Inception Meeting
2. Conducted Field Survey Visits of the Cacao Producing Municipalities
3. Hiring of Agricultural Technician
4. Develop Cacao Processing Technologies
5. To partner with LGUs with high-yielding cacao production

EXTENSION SERVICES

EXTENSION SERVICES

Risk Informed Comprehensive Development Plan for the Local Government Unit of Tubay, Agusan del Norte

The Extension Services Offices together with the Department of Interior and Local Government (DILG) Region CARAGA spearheaded a Risk Informed Comprehensive Development Plan for the Local Government Unit of Tubay, Agusan del Norte. The primary goal of this program is to strengthen LGUs' capacities in Comprehensive Development Planning (CDP) to realize sustainable and self-sufficient communities by mainstreaming Disaster Risk Reduction and Climate Change Adaptation (DRR-CCA).

A 3-day online workshop was conducted on November 27-30, 2023. The different topics were discussed: (1) Rationalized Planning System, (2) Scopes, Concerns and Mandates: Economics Development Sector, Environmental Development Sector, Infrastructure Development Sector, Social Development Sector, and Institutional Development Sector, (3) Guidelines on Mainstreaming DRR-CCA into the Comprehensive Development Plan or the CDP+, (4) CDRA Overview, (5) Ecological Profiling: Building LGU Database, (6) Visioning and Use of Database as Source of Success Indicators, (7) Sector Goals and Objectives: Defining LGU's Sectoral Targets, (8) Aligning Local Goals with Goals of Higher Jurisdictions, (9) Investment Programming: Prioritization and Investment Programs, and (10) Other Implementation Instruments and Authority Levers.

An off-site Coaching will be conducted on December 18-19, 2023, at the Conference Hall of LGU-Tubay. The presentation will also take place.





Butuan Bay Development Alliance



The Butuan Bay Development Alliance conducted the 21st Management Board Meeting on November 21, 2023, hosted by the Local Government Unit of Cabadbaran.

The following are the agenda of the meeting: (1) Operations Report presented by BBDA Operations Team, (2) Baywide Law Enforcement Group presented by the BBDA Executive Director, Ms Marisol Tuso together with Presito Nalam, BBDA TWG Chairperson , (3) BBDA Travel Policy ,(4) Support to Caraga State University offering of BS Marine Biology presentd by Ms. Shirlamaine Irina M. Calagui ,(5) Seaborne Patrol Operation Report presented by the PNP Maritime representative, Mr. Joseph D. Taguic ,(6) Fish Forever Program, presented through online by the Director for Policy and Government Engagement Rare Ph, Dennis Calvan,(7) Renewal of Contract to BBDA Operations Staff for CY 2024, and other matters.

Extension Projects

One externally funded extension project co-implemented by the CAA is the Research and Innovation Towards Achieving Sustainable Economies for Agusan del Norte (RISE-ADN) project of DOST-Caraga is still on-going. The team conducted training on Biochar Production and Soil Health Management in Simbalan, Buenavista, Agusan del Norte. The 22 coffee farmers participated in the training.



Faculty Extension Engagement (as Resource Person)

NAME	TITLE OF ACTIVITY	IMPLEMENTING AGENCY	LOCATION	DATE
Genesis Jared A. Cutamora	Technology Training on Caraga FIC Equipment and Technologies	Department of Science and Technology (DOST) Provincial Science and Technology Office (PSTO) Province of Dinagat Islands	Caraga Food Innovation Center, Caraga State University, Ampayon, Butuan City	October 17-19, 2023
Crishelo M. Cabillo, PhD Joanne A. Langres, MSc Febie T. Paglinawan, MSc	Training Course on Vegetable Seed Production and Processing	ATI-XIII	Del Monte Lowland Rice Research Station, Del Monte, Talacogon, Agusan del Sur	October 25-27, 2023
Elizabeth P. Parac, PhD Joanne A. Langres, MSc	Addressing Virus Diseases in Abaca Production: A Status Update and Comprehensive Training on Production and Disease Management	CSU-CAA	San Miguel, Tago, and Marihatag, Surigao del Sur	October 18 and November 15-16, 2023
John Mark S. Ramada, MSc Jan Marie Baldoman, MSc Benecar Olaybar, MSc Richel John Cabarles, MSc Isabel Bihag, MSc	CAA-LIFE (Livelihood Improvement through Facilitated Extension): Training on Free-Range Native Production and Management	CSU-CAA	OATC Hall, Caraga State University	November 8, 2023
Reuben James Rollon, MSc Glenn Arthur A. Garcia, PhD Sharyl Mae Daverao, MSc Leo Jude Villasica, PhD	Training on Biochar Production and Soil Health Management	DOST-Caraga	Simbalan, Buenavista, Agusan del Norte	November 17, 2023
Genesis Jared A. Cutamora	Basic Training on Vacuum Fryer, Spray Dryer, and Water Retort Operation	College of Tourism and Hospitality Management, Caraga State University Cabadbaran Campus	Cabadbaran City, Agusan Del Norte	November 30 – December 1, 2023

Impact Assessment of the Project "Strengthening Urban Agriculture: A Strategy for Ensuring Food Availability amidst the Threat of CoViD-19 in the Caraga Region"

The activity on Focus Group Discussion (FGD) and Training of Enumerators was conducted last December 6, 2023, at Archive, H.E.R.O Learning Commons. The primary goal of the activity was to fulfill the requirements under the Community Service component for the AACUP Level IV accreditation of the BSA Program. The specific focus was on the Impact Assessment of the Project "Strengthening Urban Agriculture: A Strategy for Ensuring Food Availability amidst the Threat of CoViD-19 in the Caraga Region". The activity was participated by the different beneficiaries of the project including the different brgy officials in Butuan City, municipalities in Agusan del Norte, and representatives from the Department of Education. Further, there were 5 enumerators deployed in the 6 brgy of Butuan City, the Brgy. Baan Km3, Basag, Obrero, Sumilihon, Taligaman, and Tiniwisan. They are expected to finish the survey on December 18, 2023.



Linkages and Partnerships

- CSU-CCIS meets for another round of discussion with PNP PRO13 for moving forward with the Extension Project - Project LOCAL
- Adela Serra Ty Memorial Medical Center (ASTMMC), spearheaded by the Medical Center Chief II, with Prof. Jayrold P. Arcede and Jayrhom R. Almonteros, attended the round table discussion on the possible linkage, partnership, and endeavor in terms of research and training
- Three-year Memorandum of Agreement (MOA) from 2022 to 2025 with the Department of Science and Technology- Caraga Region and Kaba-ang Livelihood Association.

Trainings and Workshops

Training-Workshop on Geographic Information System (GIS) for Infrastructure Management (November 28, 2023 – December 1, 2023)

The Caraga Center for Geo-Informatics (CCGeo) orchestrated a Training-Workshop on Geographic Information System (GIS) for Infrastructure Management last November 28 to December 1, 2023, to cater the discerning needs of technical professionals engaged in infrastructure project management.

The Training Workshop on GIS for Infrastructure Management delivered a comprehensive technical platform for participants to assimilate fundamental GIS concepts and practical applications. The integration of intricate lectures and hands-on exercises equipped professionals with the technical prowess to adeptly leverage GIS for efficient infrastructure project management. The collective efforts of resource speakers, organizers, and technically engaged participants contributed to the resounding success of the training, fostering a more proficient community in the complex landscape of infrastructure development.



New Extension Programs

Extension Project	Technology Transfer “Sago Processing Technology”-Phase 2
Duration (Start and End date)	September 1, 2023 to June 30, 2024
Funding Agency	Caraga State University- Extension Services Office
Beneficiaries	Kaba-ang Livelihood Association
Cooperating Agency	Department of Science and Technology- Caraga Region
Project Leader	Engr. May Rose B. Osoteo
Extension Workers	Engr. Aljon E. Bocobo Engr. Armdin A. Valmoria Engr. Neil Caesar M. Tado
Project Cost	P 12, 500.00 (as approved by CSU ESO)

Extension Project	Geotourism Advancement of the Province of Surigao del Norte
Duration (Start and End date)	March 15, 2023 to December 31, 2023
Funding Agency	Caraga State University- Extension Services Office
Beneficiaries	Surigao del Norte PPDO and LGUs
Cooperating Agency	None
Project Leader	Riva Karyl P. Varela
Extension Workers	Patrick Sam M. Buenavista Nichole Anthony D. Pacle Maria Isabela R. Pedrola Engr. Monalaine M. Bermoy Engr. Carmel S. Burlat
Project Cost	P 27,300.00 (as approved by CSU ESO)

Technology Transfer “Sago Processing Technology”-Phase 2 Activities

The project team together with the other faculty members of the Department of Agricultural and Biosystems Engineering conducted last October 16, 2023, an inception meeting to plan out the retrofitting activity and the monitoring activities that will be conducted to fit the deployed technology to the needs of the members of the Kaba-ang Livelihood Association of Barangay Baan, km 3, Butuan City and to continuously monitor the status of utilization of the deployed technology

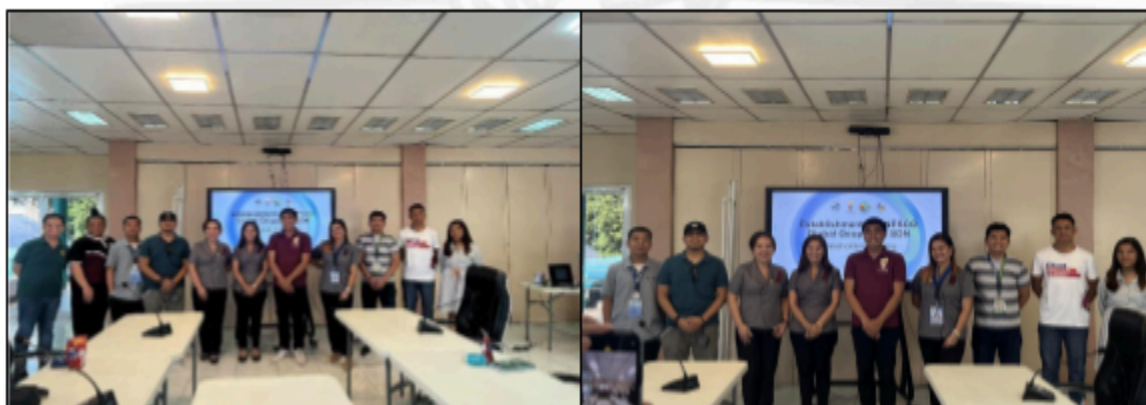
After the inception meeting, the project team together with members of Kaba-ang Livelihood Association and some ABE students conducted a retrofitting activity for the Sago rasping machine that was previously deployed to the association. The activity was done to replace one of the electrical motors of the machine and to fit the machine based on the needs of the recipients.

On the 24th of November 2023, another set of ABE students accompanied the project team at Barangay Baan, km 3 in Butuan City to conduct a monitoring activity. During the activity, Hon. Agnes Sas, the president of the Kaba-ang Livelihood Association discussed on what they want to improve the machine's performance.



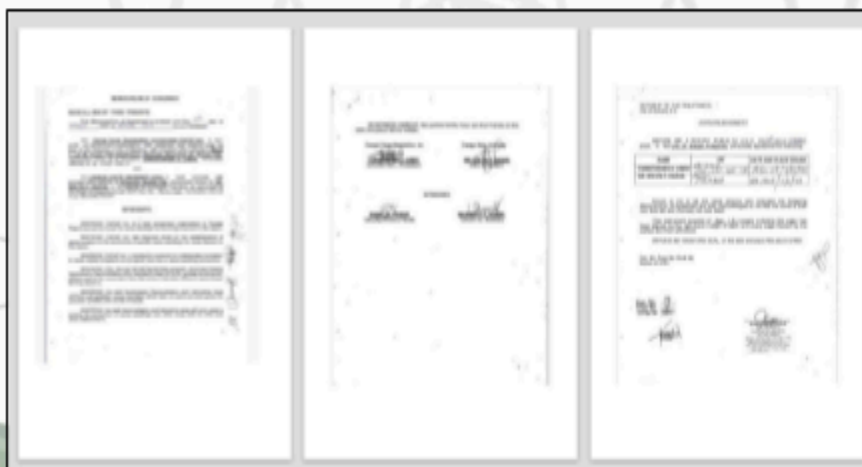
Geotourism Advancement of the Province of Surigao del Norte

The Stakeholder's Meeting was conducted as a follow-up after the endorsement of the provincial government of SDN for the proposed Geopark. In this meeting, further discussion on selecting potential sites for UNESCO Global Geoparks, as crafting the project framework and initial steps of the MOA and preparing for the capacity building training workshop. This meeting was attended by the SDN Provincial Planning and Development Office, the Provincial Environment and Natural Resources Office, the Provincial Tourism Office, the Mines and Geosciences Bureau, and the CSU-Department of Geology.



Linkages and Partnerships

CSU-CoFES, through Agroforestry program, successfully linked and partnered with the CaCao Inc., for the establishment of Cacao Nursery in the AF Demo and Laboratory Area, located at the southeastern part of the university's farm. It was approved during the BOR meeting last May 6, 2023. The MOA was already signed by both parties. The establishment or construction of the nursery was already finished.



Other Accomplishments

DA – Caraga Region

Through the initiative of the college, DA-Caraga established a vegetable nursery in the CSU – AF Demo and Lab Area at the CSU farm. The construction of the nursery and the MAO was still going on.

LGU Nasipit, Agusan del Norte – DA-ATI

LGU Nasipit, Agusan del Norte, DA-ATI, and CSU endeavors to have a partnership in the establishment of the Farmers Information and Technology Services (FITS) Center in the municipality. This is to enhance the dissemination and services of the LGU about AFNR-related information, activities, and programs. MOA for this partnership is still in process.

Agroforestry Demonstration and Laboratory Area (AFDLA) (CSU-CoFES-AF Program, DA, PCIC-CC, CaCao Inc.)

Continued development and improvement in the AFDLA was conducted. Crops were already planted, and harvested by the students. However, for the perennial crops, only calamansi, coffee, some cacao, and some hedgerows were planted. Two nurseries for cacao and vegetables were also constructed in the area. This was in partnership with PCIC-CC, CaCao Inc, and DA- Caraga Region. Banana tissue cultured seedlings were already in the area. This was given by DA-RFU 13 through its satellite field office in Talacogon, Agusan del Sur.



CHALLENGES, OPPORTUNITIES, and WAYS FORWARD

Challenges, Opportunities, and Ways Forward

Technology Transfer and Licensing Office

CHALLENGES MET	RECOMMENDATION
The first ever budget allocation for the office from GAA, through the FLR-funds, was initially designed for a 1-year operation but was urgently compelled to be utilized before November 2023 ends.	Proposed a meaningful activity to exhaust the funds. Hence, the birth of idea for the LIKHA Summit 2023.
Most of the designated College IP Coordinators (CIPCs), endorsed by the College Deans, have overlapping designations leading to under-performance and under-participation to capdev activities.	Continue capacitating new faculty members to have more reserves and potential members to take on the job.
The targeted IP Awareness activities were affected due to budget constraints at the colleges, and some are not yet accomplished.	Encourage a culture of conducting activities that do not require snacks/meals. Accomplish the remaining targets via webinars.
RAISE Fund release is delayed due to accounting clearance issues for the project "National Integrated Banana R&D Program -Proj. 2.4 Adoption of S&T Based Integrated Crop Mgt. (ICM) and Good Agricultural Practice (GAP) for Cardaba Banana in Caraga" by Dr. Rowena P Valera, as well as due to some issues on the Org. Structures and Certification of Smallest Units.	Persistent follow-up and provision of requirements
No Administrative staff has been designated to the TTLO;	Follow-up the status of request, and temporarily fill-in the role gaps.
Delayed implementation of various capacity-building activities, including the <i>Local Inception Meeting, Year 1 Operational Planning, etc.</i> , tentatively scheduled on Year 1 Quarter 1 (October - December 2023)	Create comprehensive activity plans/activity designs for the upcoming RAISE Project 1 capacity development (capdevs) activities, allowing ample time for both the implementation of the activity itself and any necessary pre-activities.
No fund utilization for Year 1 Quarter 1 (October - December 2023)	Prepare the PRs or any other essential documents required to request the procurement of all necessary supplies and materials for operations and activity execution.

Technology Transfer and Licensing Office-Innovation & Technology Support Office

CHALLENGES MET	RECOMMENDATION
The facilitated technologies for IP Commercialization with SRS Trading Inc. have adverse issues. The UM has already expired, while the other one has been degraded from patent to UM.	Promote the expired UM for Extension activities Follow-through of application development until granting of IP protection
Difficulty to commercialize IP protected technologies due to low Technology Readiness Level (TRL) and mismatch with potential adopter's needs.	Encourage researchers, through RDI Centers, to identify and address actual community-based gaps/problems, and employ different strategies to conduct research development to increase TRL of technology outputs.
Slack disclosure initiatives from RDI Centers / Researchers	Strategize and confer with OVPRIE to obligate RDI Centers/Colleges to substantially disclose IP Assets for protection prior to publication
Swayed commitment	<ul style="list-style-type: none"> Conduct a yearly activity that promotes inner reflection and renewed commitment (ex. spiritual retreat)
Constricting Workspace	<ul style="list-style-type: none"> Workspace for all CIPCs
'Food-stalls' Entrepreneurial experience' of CBA graduating students	<ul style="list-style-type: none"> CBA may design a clear set of learning activities that promotes entrepreneurship while upholding creativity and innovation

Future Plans

- IP Valuation Seminar-Workshop
- Promote 'ato ini' – patronization of internally-made innovative food products
- Push for the commercialization of research-based food innovations
- Commence operations with TBI
- Construct FTBI and Tech Park
- Hire permanent Technical Staff and Drafter/s

RAISE Project 1 Year 1

- Development and implementation of Communication Plan
- Technology Commercialization Development Workshop
- Participation in the National Pitch Festival
- Regional Promotional Activities
- Regional Policy and Technology Transfer Protocol Review Workshop
- Regional IP Audit and Inventory Workshop
- Regional Inception Meeting
- Operational Planning for Year 1



Research & Development Publication Office

CHALLENGES MET	RECOMMENDATION
<u>Low</u> acceptance of reviewers	Opportunities for mentoring on publication Ethics
<u>Slow pace</u> of revision by authors	Opportunities to improve mechanism/ process flow for Research Ethics

Future Plans

- Upgrading of JESEG and jASSH website
- Revival of other CSU journals to finally take flight
- Application for indexing in ACI and Scopus
- Research Ethics Manual finalization and presentation for approval

Center for Resource Assessment, Analytics, and Emerging Technologies

- Lack of research staff to transact center documents. It is recommended to install staff in the research centers for document keeping.
- Allotment of funds for office operations.

Future Projects in 2024:

1. Impact Assessment of Farm-to-Market Road (FMR) in the Philippines in partnership with CHCI

Fund Source: DA-BAFE: Php 10 M

2. ACMEC Pro+: Advancing Commercialization and Mechanization for Enhanced Commodity-Based Processing in Caraga Region

Fund Source: DOST Caraga: Php 3.43 M

Action towards Greater Advancement of Knowledge

CHALLENGES MET	RECOMMENDATION
Delayed completion on the program of activities	More strategic planning and monitoring
Lack of time/trainings on research proposal packaging for possible external funding. Need more in-depth mentoring for research dissemination	Trainings on enhancing technical and fundamental strategies in collaborative research

CARAGA CENTER FOR GEO-INFORMATICS

Future Plans

- HYDROLOGICAL STUDY OF MANOLIGAO WATERSHED IN
- DINAGAT ISLAND CONSERVATION PROGRAM (1 year, NGO
- Funded, 800,000.00+) – KAISAHAN INC.
- Bamboo Project (9 months, PGAN Funded, 600,000.00+)
- RESIST Crime Project (1 year, DILG-RPOC Funded, 1.8M)
- EO4minEx Project (2 years, Collaboration with ITC Cambodia)
- GeoTech4Agri Project (6 months, Students Outputs)
- 12 research papers presented in different conferences (mentioned in the previous slides) are under review for publication a Scopus-indexed.
- Training on GIS for Irrigation Management (NIA Region VI), First Quarter next year.

Center for Nanoscience and Technology for Research and Entrepreneurship

- A low number of funded research;
- The low productivity in publications, innovations, patent applications, etc.;
- Low number of research collaborators;
- A very small number of faculty members are involved in research activities;
- Limited funds;
- No extension activities/projects yet

Future Plans

- Increase the number of funded researches by involving or affiliating faculty with research interests to increase the research productivity of the CeNTRE;
- Forged more collaborations with other universities (local and international);
- Conduct regular meetings and workshops on crafting research proposals.;
- Continued capability building through training on the use of facilities available in the CeNTRE;
- Increase the number of publications, patents, innovations, etc.;
- Increase the number of collaborations with local and international research institutions.;
- Conduct extension activities

Caraga Food Innovation Center

Future Plans

- Training on four (4) Contract R&D products to DOST ADN and Municipality of Jabonga (Dec. 91-21, 2023)
- Training at DTI ADS for Calamansi Marmalade (Dec. 18, 2023)
- TACOFACO Contract R&D for two (2) Coco Products
- Model Network Cooperative

Mathematical and Statistical Computing and Research Center

Challenges Met

1. No Seed fund for visitors to spend on food, local fare, and accommodation
2. No funds to go abroad just to sign MOU/MOA
3. When training workshops, people cannot devote quality time due to many meetings and events
4. Researchers specifically at the Math dept became admin full time, it lessened the time to research
5. Too many activities, less time to write papers!
6. Encourage people to do IMs, help from AGAK?

Future Plans

- Expand the training, more numbers of faculty to be trained for data analysis
- Then afterward, go higher in terms of capacity building (AI, ML, Sci+ML, Digital Twin, Bayesian Statistics)
- Empower people to do projects, I mean interdisciplinary projects
- At least 3 lms, LG, for 2024 to propose
- At least 2 affiliated faculty doing postdoc by 2024
- At least 2 affiliated faculty doing visiting professorship(outbound/inbound)-(JFajardo @ UPLB, Nanang at GMU)
- SEAMS in statistics, epidemiology, and Algebra by 2025

Information and Communication Technology Center

Challenges Met

- Undermanned in Research Side
- No Allocated Research Budget for the Center
- Deloading of Affiliate Researcher

Future Plans

- Starting to engage in Research
- Trying to collaborate with Envi-Sci, Agriculture, ECE

Center for Renewable Energy, Automation and Fabrication Technologies

Challenges Met

- There was no formal turnover by previous CRAFT Director, Reports, and Paper Tray of 1st and 2nd quarter was missing.
- Development of CRAFT One-Stop Shop Website (*Phase 1*)the

Center for Renewable Energy, Automation and Fabrication Technologies

Future Plans

- Improve its capabilities in **Automation** and **Process Control Systems** but also to actively engage and align its operations with the growing importance of **Renewable energy**.
- **CRAFT** likely follows practices in both **fabrication and technology**, with a strong emphasis on integration, sustainability, and collaborative research to ensure it remains a leader in the field of **prototyping**, not limited to **packaging and labeling**.
- **CRAFT Beyond**: Delve into the development of low-cost biomedical machines tailored for CARAGANON's. This initiative aligns with the broader goals of making healthcare technologies more accessible and addressing the unique challenges of healthcare in CARAGA.

Center for Research in Environmental Management and Eco-Governance

Challenges	Recommendations
1. Some environmental and eco-governance related projects are not anchored to CREME	Open discussion with the faculty affiliated to CREME

Mindanao Institute for Mineral Resources Management Research and Training

Challenges Met

- Procurement Process (PPMP for identified consultants) Repair of AAS instrument to be used for chemical analysis will not be pushed through as some instrument's part are no longer serviceable. Funds will be realigned next year for chemical analysis.
- Change of Implementation Date – some of the projected activities (conduct of several trainings) were moved to 2024.
- Original partner mining company has decided not to continue for 2 on-going projects.

Future Plans

2 Research Proposals will be submitted to DOST-PCIEERD and DOST-NRCP (Mid 2024, awaiting Call for Proposals)

Conduct mining-related training and workshops

Expand partnerships (MGB, EMB, LGUs) as possible technology adaptors of any technology developed by the center

Caraga-Center for Agri-Forestry Research and Entrepreneurship

Challenges Met

1. Publication of research-anchored studies
2. Translation of Research studies into Extension activities, primarily to the Farmers
3. Unclear setting of Target Accomplishments per Center Allocation
4. Budget Allocation

Future Plans

Center Development Plan (3 Year Plan)	
Year	General and Tentative Proposed Activity
2023	Translation of previous research activities into extension program and strengthen farmer community to research center partnership
	Strengthen the research laboratory capacity of the Center in coordination with research projects and students
	Crafting of new research proposal for the succeeding years
2024	Engage in international research collaborations for proposal making and mobility
2025	Strengthen ties with local government agencies and other research centers in SUC's and private companies

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