



# CPU Research NEWSLETTER

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## CPU Co-sponsors First International Symposium on Moringa

Central Philippine University was a co-sponsor of the First International Symposium on Moringa (ISM) held at Crowne Plaza Hotel, Ortigas Avenue, Quezon City last November 15-18, 2015. The other co-sponsors were Moringaling Philippines Foundation, Inc., the International Society for Horticultural Science (ISHS), Asian Vegetable Research and Development Center - The World Vegetable Center (AVRDC-WVC); and Farm Systems International Organization.

The theme of the event was "Moringa: A Decade of Advances in Research and Development".



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## CPU-CARES Paper Wins 2<sup>nd</sup> During NSAARRD 2016



Dr. Cabarles presenting their paper on "Development of Supplemental Feeds for Free-Rage Native Chicken"

Central Philippine University-College of Agriculture, Resources and Environmental Science's (CPU-CARES) project on the "Development of Supplemental Feeds for Free-Rage Native Chicken" won Second Prize under the Development Category during the National Symposium on Agriculture and Aquatic Resources Research and Development (NSAARRD) held in Los Baños, Laguna last July 27, 2016. The annual competition sponsored by the Department of Science and Technology recognizes the best among the research and development paper entries submitted

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## Co-sponsors... From page 1



Dr. Manuel C. Palada, ISM chairperson and convenor, with Prof. Hope G. Patricio prior to the commencement of regular sessions

According to Dr. Manuel C. Palada, visiting CPU professor and likewise the chairman and convener of the symposium, the ISM brought together 180 researchers, scientists, professors, development workers, business and

industry groups, farmers, students, government, and non-government organizations from 50 different countries for knowledge and information sharing on Moringa - the multi-purpose Miracle tree.

In his welcome message, Prof. Rod Drew, ISHS president, underscored that more than 200 million people are chronically undernourished and suffer from energy and/or protein deficiency. Moringa provides not only higher levels of protein but also high levels of vitamins and nutrients. Similar sentiments were expressed by Dr. John Donough Heber Keatinge, director general of AVRDC - WVC, who added that the symposium highlighted innovative uses for all parts of Moringa and examined ways to expand rural value chains through the processing and marketing of Moringa-based products.

The second ISM event will be in 2019. Some participants from five countries (Kingdom of Saudi Arabia, Indonesia, South Africa, Egypt, and the United States of America) have each offered to host the next gathering. \*

## CPU-CARES... From page 1

by each regional symposium after being declared as regional winner during their previously held Research and Development Symposium.

Dr. Jaime C. Cabarles, Jr., presently the Dean of CARES, was the one who presented the paper in behalf of his fellow researchers, namely: Hope G. Patricio, Froilan Cabarles, Darleen Jane Cañoso, Jenely Martin Saban, Edmundo Calasagsag, Thomas Cabinan, Efrén Cantomayor, Pearly Gersaniva, Chaué Nabuab and Jude Denmark Taladhay. The team received a cash prize and a plaque of recognition given during the awarding program which was also celebrated in observance of the National Science and Technology Week by the Los Baños Science Community.

First Prize was won by a collaborative project of Southern Philippines Agribusiness and Marine and Aquatic School of Technology and the University of Southwestern Philippines based in Davao Occidental and Davao City,



Dr. Cabarles receiving the plaque of recognition from Hon. Fortunato Dela Peña, DOST Secretary, as Dr. Reynaldo V. Eborá, Acting Executive Director of PCAARRD, looks on

respectively, on a study about Coco Sap Production and Technomart Products. Third Prize was on the study about mango production in Bataan Peninsula State University.

It is also worth mentioning that CPU-CARES also won Second Prize some years back under the same category. \*

## CPU CARES professors present papers at the First International Symposium on Moringa

During the First International Symposium on Moringa held at Crowne Plaza Manila Galleria last November 15-18, 2015, two professors from the CPU College of Agriculture, Resources, and Environmental Studies and two CPU alumni were among the 69 paper presenters from 50 different countries. The theme of the event was "Moringa: A Decade of Advances in Research and Development".

Dr. Manuel Palada, also the chairman and convenor of the symposium, talked on "The Moringa Industry in the Philippines: Status, Challenges, and Opportunities" and "Progress in Research and Development of Moringa at AVRDC-The World Vegetable Center."



Dr. Manuel C. Palada highlights the benefits from Moringa

Prof. Hope Patricio, on the other hand, presented two papers, one of which was on "Adaptability and Horticultural Characterization of Different Moringa Accessions in Central Philippines" and the other on "Biomass Yield of Moringa oleifera as Influenced by Plant Density and Frequency of Pruning."



Dr. Mark Olson, world renowned scientist and Moringa champion from Mexico, presents a certificate of appreciation to Prof. Hope G. Patricio for her paper on Moringa adaptability and characterization study

CPU was co-organizer of the symposium together with Moringaling Philippines Foundation, Inc., the International Society for Horticultural Science (ISHS), Asian Vegetable Research and Development Center - The World Vegetable Center (AVRDC-WVC); and Farm Systems International Organization.

"Technology is just a tool. In terms of getting the kids working together and motivating them, the teacher is most important."

-Bill Gates

## CPU chosen by Capiz Provincial Population Office to Evaluate the Existence of Teen Centers in their Province

The CPU Research Center was chosen by Capiz Provincial Population Office to conduct an evaluation study to assess the effectiveness of teen centers and their impact in the lives of the youth in their province this last quarter of 2015. The establishment of teen centers is an innovation in the strategies with respect to the implementation of the Adolescent Health Youth Development Program (AHYDP) in the province of Capiz in Region VI. The establishment of teen centers is considered to be the best practice in AHYDP implementation which gave the Capiz Provincial Population Office a national award in 2012 and was also commended by the region and the Province of Capiz as well. This project is a collaborative effort of government organizations (GOs), non-government organizations (NGOs) and local government units (LGUs). Hence, from the inception stage of these teen centers, the support, assistance and coordinated effort of the Regional Population Office (RPO) 6, Capiz Provincial Population Office,

local government units and Department of Education (public high schools) cannot be understated.

According to the Teen Centers: “Best Practice in the Implementation of Adolescent Health and Youth Development Program (AHYDP) of Capiz Provincial Population Office”, these centers were established with the following goals and objectives: to enhance the technical capacity of service providers in giving AHYDP information and counseling; to improve the awareness and knowledge of adolescents on AHYDP issues and concerns; and, to provide a wholesome place aside from their classrooms for the youth to while away their free time or leisure hours, promoting in the process a peaceful and harmonious atmosphere within the school’s campus.

The first teen center in Capiz called “Teen Zone”, was established in 2003 at Capiz State University

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## Research and Development Week held



Central Philippine University through its research arm, the University Research Center celebrated the 13th Research and Development (R&D) Week last March 7-11, 2016. The highlight of the celebration was the Research Symposium for the faculty and the students, now on its 17th and 14th year respectively. The symposium featured the research works of several student research groups from High School Department and the different colleges of the university and the selected members of the faculty and staff from different fields of study.

The student research symposium was, in fact, a competition among student researchers whose works were grouped into different categories. In the Environmental

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## R & D week... from page 4

Management Category of the College of Agriculture and Environmental Sciences (CARES), the work of Lexy Jane Cerrada entitled “Level of Knowledge about and Practices of Solid Waste Management among Households of Barangay Duyan-duyan, Cabatuan, Iloilo” won first place, followed by Shiela Mae Cepeda’s “Knowledge about Solid Waste Management and Solid Waste Management Practices of Households of Barangay Samabalud, Pototan, Iloilo on second place. Hyacinth Ortigas’ research on Solid Waste Management Programs of Bayawan City, Negros Oriental: A Case Study placed third.

In the Agriculture Category, still under CARES, Sherrill Anne Billones’ research on the Growth Performance of Oyster Mushroom (*Pleurotostreatus* Jacq. Fries) Spawn using different Culture Media won first place, seconded by the study on “The Influence of Hot Water Treatment, Lemongrass (*Cymbopogon citratus*, Stpf.) and Basil (*Ocimum sanctum* Linn) Essential Oil on Shelf Life of ‘Carabao’ Mangoes (*Mangifera indica* L.). Third place went to Harlene B. Posadas’ “Brooding Performance of Native Chicken Chicks as Influenced by Inclusion Levels of Natural-Source Methionine in CPU Pre-starter Feeds.”

In the Agriculture Category, still under CARES, Sherrill



Anne Billones’ research on the Growth Performance of Oyster Mushroom (*Pleurotostreatus* Jacq. Fries) Spawn using different Culture Media won first place, seconded by the study on “The Influence of Hot Water Treatment, Lemongrass (*Cymbopogon citratus*, Stpf.) and Basil (*Ocimum sanctum* Linn) Essential Oil on Shelf Life of ‘Carabao’ Mangoes (*Mangifera indica* L.). Third place went to Harlene B. Posadas’ “Brooding Performance of Native Chicken Chicks as Influenced by Inclusion Levels of Natural-Source Methionine in CPU Pre-starter Feeds.”

In the College of Arts and Sciences Chemistry category, the top three research works are the following: “Phytochemical Contents of Flowers, Leaves and Seeds of *Caesalpinia pulcherrina* (kabalyero)” by Angelica B. Arcenal (first), “Proximate Composition of Leaves, Flowers and Seeds of Kabalyero (*Caesalpinia pulcherrina*)

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(CapSU) in Bailan, Pontevedra. This was made possible through the assistance of the 5<sup>th</sup> Country Program Assistance of the United Nation Fund for Population Activities (UNFPA). This was followed by the “Teen Health Zone” and “Rumbuhan” in CapSU Pilar and Mambusao, respectively. Nineteen more teen centers were established in 2004, 24 in 2007 and 6 in 2009 making a total of 52 teen centers in the province of Capiz. These teen centers flourished with the support of the provincial government. It was hoped then that this project could even be replicated

in the private high schools in the province.

Since then, there was the teen center galore in Capiz. According to the students, teen center coordinators and teachers, these teen centers were indeed beneficial to the students or youth of Capiz. Majority of them had a favorable feedback on the importance of these teen centers in the lives of young people, however, no studies had been conducted yet as to prove this, hence this study was commissioned. \*

## R & D week... from page 5

by Neil-Ju Angelle C. Cadio (second), and “Determination of Heavy Metal Content of Asisig Creek by AHS” by Gayle Angelli Eusala (third).



Only the top among the three researches in the Social Sciences category was declared the winner. This single honor was given to the group of Erla Grace Agutaya for their work entitled, Schadenfreude, Sympathy and Empathetic Embarrassment: The Attituded of CPU Students towards Epic Failures. Other members of the group were Lauderdale Robite, Kezia Normaine Pamating and Tobias Mandolado, Jr.

In the Medical Technology and Life Sciences category, the top two of the four papers presented were awarded the first and second place respectively: “Antiangiogenic Screening on Babana (*A. Musicata*), San Pedro (*S. multifide*), and Manunggal (*I. rumphii*): Pontential to Combat Cancer Proliferation” presented by John Erickson H. Salarda and “Cnidarians in Cabaling Beach, Jordan, Guimaras” presented by Claress Laguna.

The study on Factors Influencing the Level of Compliance with Medical Regimens among College Students at Central Philippine University presented by Ian Clark Tamonan bested all other papers in the Education related category. Coming in the second place was the work of Ella Lee Galve’s group on Factors Related to Grammar Skills Proficiency on Subject-verb Agreement among Freshmen College Students at Central Philippine University, followed by the study on Level of Knowledge in Algebra of High School Students at Central Philippine University by the group of Erna Mae Salazar.

Meanwhile, among the College of Engineering student researches the paper presented by Angelo Listano entitled “Wireless Network Projector Module (Wi-NetPro)” garnered first place, followed by Angelette Shahar Cornel’s “A Package Development on Shipping Containers for Fresh Mangoes of Leon Mango Growers and Producers Association (LMGPA) for Export Shipment” and Joshua Alexander Villanueva’s “Drowsiness Recorder and Indicator with Virtual Electroencephalogram (DRIVE): A Brain Equipment Safety Interface” on the second and third place respectively.

The College of Business and Accountancy had the most number of research papers presented with a total of nine, but only the top three were awarded: “Barriers to Growth and Competitiveness of Salon and Barber Shops in Iloilo City” by Ginmar Duga, “Acceptability of the Implementation of Comprehensive Perimeter Boundary Ordinance among Commuters, Drivers, Business Sectors and General Public” by Jayzelle Gelario, and “Entrepreneurial Propensity of College of Business and Accountancy at Central Philippine University” by Glaiza Christ Darato, in the first, second and third place, respectively.



For the High School Special Science Class category, the paper presented by Aila Rose Asuelo entitled, “Antioxidant Property of Three Indigenous Fruits” ranked first, followed by Ross Frange’s “The Molluscicidal Efficacy

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## R & D week... from page 6

of Borax (*Sodium tetrabonatedecahydrate*)” came second, and Isabella Hidrosollo’s “Antibacterial Activity of Tamarind (*Tamarindusindica*), Guava (*Pesidiumguajava*), and Kamias (*Averrhoabilimbi*) in Leaf Extracts against *Staphylococcus aureus*” place third.

Aside from the students, several members of the faculty and staff also presented their university-funded research. The topics were on different fields on study such as social science, mathematics, electronics and engineering, chemistry, biology, and agriculture. The presentors and their respective topic were the following: Prof. Hope G. Patricio, “Biomass Yield of *Moringa oleifera* as Influenced by Plant Density and Harvest Population”, Prof. Aries Roda D. Romallosa, “Comparative Study of Muscovado Sugar Mills in Antiques and Sultan Kudarat (PEF)”, Prof. Ma. Mercy A. Japitana, “Extent of Deterioration and Formation of Toxic Substances in Cooking Oil (Coconut Oil) when Heated Repeatedly above Smoke Point”, Dr. Reynaldo N. Dusaran, “Citizen Satisfaction Index System (CSIS) for an LGU in the Province of Iloilo (2015).

Dr. Merle L. Junsay, “The Effect of Reflective Journal Writing to Students’ Critical Thinking and Mathematical

Communication Skills”, Prof. Ernesto S. Saquibal, Jr., “Ilonggo Perceptions on the Extent of Patronage Practices and their Attitudes toward Intra-Familial Succession in Iloilo”, Mr. Rex S. Rubidy, “Contruction and Testing on Improvised Leaf Electroscope (ILE)”, and Prof. Caesar Rico S. Acanto anf Prof. Ramon A. Alguidano, Jr., “Design, Construction and Testing of Microprocessors-Based Electronic Load Controller for Micro-hydro System.”.

Dr. Lejo C. Braña, an alumnus of CPU, was the guest presenter and he shared his study, entitled, “Total Performance-A Holistic Approach to Research and Development.”

The symposium for the faculty and staff ws held at the Knowledge for Development Center on March 11, while the students’ symposia was held at different venues in the university on March 8-9, 2016.

The R & D Week is an annual celebration spearheaded by the University Research Center to heighten the awareness about research, to provide an avenue for students and faculty and staff to share their research outcomes, and arouse the interest in research of the academic community. \*

## Philippine Health Research Ethics Training



## URC conducts data processing seminar

In response to the growing number of university students engaged in research, the University Research Center (URC) under the leadership of Dr. Reynaldo N. Dusan, sponsored a seminar-workshop on data processing, analysis and interpretation last December 5 and 12, 2015 at the College of Computer Studies, Mary Thomas Computer Laboratory I, Central Philippine University.



were quantitative, thus required data processing, analysis and information. It was hoped by the URC that through the activity, the students had learned skills necessary in doing research eventually would be able to produce quality research works that would be beneficial to the university and the society as well.

The seminar workshop aimed to help students understand data processing and the steps involved in it, determine the different schemes of data processing that are appropriate for a given set of data, and enable them to learn how to code data and create data files. It is observed that most researches conducted by students in the university

The seminar workshop was well-attended by 84 students from the Colleges of Education and Business and Accountancy, and the Department of Languages, Mass Communications and Humanities. \*

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## HS wins poster making contest

The poster entry for the study “Larvicidal Efficacy of Aqueous Tobacco (*Nicotianatobacum*) Leaf Extracts against Housefly (*Muscadomestica* L.)” of the High School researchers led by Nikko Limua bested all the other entries during the 13th Research and Development Week Poster Making Contest last March 7-11, 2016.

Coming in second is the poster for the study “Antiangiogenic Screening of Babana (*A. Municata*), San Pedro (*S. multifide*), and Manunggal (*I. rumphii*): Potential to Combat Cancer Proliferation by John Erickson Salarda and

company of the College of Nursing, Allied and Health Sciences, and the poster from the College of Arts and Sciences-Social Sciences for “*Schadenfreude*, Sympathy and Empathetic Embarrassment: The Attitudinal of CPU Students towards Epic Failures” ranked third.

A total of seven entries were submitted from the different colleges and the High School Department of the University. \*

## **BIOMASS YIELD OF *MORINGA OLEIFERA* AS INFLUENCED BY PLANT DENSITY AND HARVEST FREQUENCY**

Manuel C. Palada, Hope G. Patricio, and Diaden E. Garcia

### **ABSTRACT**

This study was conducted to determine the leaf biomass yield of *Moringa (Moringa oleifera)* as influenced by plant spacing and frequency of harvesting. *Moringa* plants were grown at four plant spacing and densities: a) 1 m x 1 m (10,000 plants per hectare-pph); b) 1 m x 0.5 m (20,000 pph); c) 0.9 m x 0.37 m (30,000 pph) and d) 0.5 m x 0.5 m (40,000 pph), and harvested at three frequencies: 4, 6, and 8 weeks. The field trial was established in a factorial randomized block design with three replications. *Moringa* seeds cultivar PKM-1 were directly sown in various plots on 12 December 2013. Optimum soil moisture for germination and seedling growth was maintained and complete fertilizer was applied at one tablespoon per plant three weeks after emergence. Seed germination and plant height were recorded on periodic basis. Initial harvest for

all treatments was performed 116 days after sowing. Thereafter, harvesting frequencies were followed according to treatments. Results showed that the effect of plant density, harvest frequency, and interaction between plant density and harvest frequency were significant. Overall, fresh leaf biomass increased as plant population increased from 10,000 to 40,000 pph. There was a positive correlation between plant density and biomass yield. Similarly, the longer the harvest frequency the higher was leaf biomass. Based on this study and growing conditions, the optimum plant density for fresh leaf production can be from 20,000 to 30,000 pph. Although leaf production was low at 4-week harvest interval, this frequency may be desirable when there is a need for monthly supply of *Moringa* raw material for processing into leaf powder and other by-products.

## **EXTENT OF DETERIORATION AND FORMATION OF TOXIC SUBSTANCES IN COOKING OIL (COCONUT OIL) WHEN HEATED REPEATEDLY ABOVE SMOKE POINT**

Ma. Mercy A. Japitana

### **ABSTRACT**

This study was conducted to determine the stability and the toxic substances formed when cooking oil (Refined, Bleached and Deodorized-Cocount Oil or RBD-CNO) is subjected to heat treatments. Four treatments were used in the study: the untreated (UN), T1 was heated once, (T2) heated twice with intermittent cooling and (T3), heated thrice with intermittent cooling. There were three replicates for each treatment. The samples were analyzed for fatty acid profile, free fatty acid value, peroxide value and the amount of PAH present. The mean of the results obtained for all treatments were subjected to one way analysis of variance (ANOVA). The fatty acid profile showed that only

the linoleic acid decreased in quantity constantly up to the third heating, significant at 5% a. Free fatty acid and peroxide values showed an increasing trend, which were significant at 5% a. Out of the 22 PAH analyzed, only 1,6,7-trimethylnaphthalene showed an increasing trend, significant at 5% a. To compare treatment of linoleic acid showed a significant difference between UN and T1, UN and T2, UN and T3 but treatments T1, T2 and T3 were not significantly different from each other at 5% level of probability. For both the free fatty acid and peroxides values, UN, T1, T2 and T3 showed a significant difference compared to each other at 5% level of probability.

## **ILONGGO PERCEPTIONS ON THE EXTENT OF PATRONAGE PRACTICES AND THEIR ATTITUDES TOWARD INTRA-FAMILIAL SUCCESSION IN ILOILO**

Ernesto S. Saquibal, Jr. and Ma. Lindy B. Saquibal

### **ABSTRACT**

The study examined politics in Iloilo by looking into *Ilonggo* voters' perceptions of patronage practices of local politicians, and how these conditions influence their attitude towards dynastic politics or intra-familial succession in the local level. A total of 384 respondents were surveyed through face-to-face interview. Chi-square and Gamma tests were used to determine the significant relationships between variables. Findings of the study reveal that the use of patronage has contributed to the election success of the Governor, Congressman, Mayor and Punong Barangay to *Some Extent* (40.8%) and to a *Great Extent* (18.3%). One in four (24.5 %) of the respondents were *Not Sure or Uncertain* of its effect while 11.8 percent noted that its effect is *Negligible*. With regard to their attitude towards 'dynastic' politics or intra-familial succession, one in five (22.1%) among the *Ilonggo* voters holds a *positive attitude* compared to three-fourths (74.5 %) who exhibit a *Neutral Attitude* towards these politicians. These findings thus suggest that the *Ilonggo* voter perceived that the extensive use of patronage has generally contributed to the election success of local politicians in the Province. These findings validate an earlier study on political patronage in Iloilo City by Saquibal (2008) that local politicians are more inclined to implement patronage projects which are "easily visible" such as infrastructure projects, e.g. roads, drainage systems, artesian wells and water hand pumps, and have "more immediate, tangible 'personal' impact on

constituents in the form of social welfare services, i.e., medical assistance and assistance to victims of calamities, as well as personal assistance, i.e., burial assistance, e.g., free coffins and funeral services. For sure, many of these projects do not respond to the long-term needs and problems of constituents, and have only a 'fleeting' impact on their lives. Often, these patronage projects served as functional 'promotional' tools from where local officials draw their political strength and support comes election time. Moreover, the *Ilonggo* voter exhibits a *generally ambivalent* attitude, but not a *negativistic* one, with respect to candidates from 'dynastic' families. Respondents are more inclined to support 'dynastic' politicians that exhibit good personal qualities and performance while in public office. There is high consensus to reject candidates who are perceived to be corrupt. However, the practice of patronage cannot account for respondents' attitude towards dynastic politics. Since the data was gathered primarily through a survey, thus limiting itself to quantitative results and analysis, it is recommended that in-depth interviews with key informants, i.e., local officials and community leaders be employed to come up with more meaningful analysis. Replicating this study in other cities and provinces in the Philippines and examining other variables might yield better understanding of Filipino electoral politics in the local level.

## **THE EFFECT OF REFLECTIVE JOURNAL WRITING TO STUDENTS' CRITICAL THINKING AND MATHEMATICAL COMMUNICATION SKILLS**

Merle L. Junsay and Edgardo P. Gerada

### **ABSTRACT**

The objective of this quasi-experimental study was to investigate the effects of reflective journal writing to the students' critical thinking and mathematical communication skills. There were two teaching strategies under investigation in this study: the lecture-discussion approach and the reflective journal writing approach. A total of 60 participants, 30 prospective teachers from two comparable classes underwent the two teaching approaches. The students' critical thinking and mathematical communication skills were measured using researcher-made tests, which were content-validated and reliability tested. The lecture-discussion

approach involved five phases: introduction, presentation, comprehension monitoring, integration, and review and closure. The reflective journal writing approach involved initializing, exploring, and connecting processes. Findings revealed that the performance of students in mathematical communication skills exposed to reflective journal writing approach was significantly higher than the performance of students exposed to the lecture-discussion approach. In contrast, there was no significant difference in the mean gain scores in critical thinking for both lecture-discussion and reflective journal writing groups.

## **CONSTRUCTION AND TESTING OF AN IMPROVISE LEAF ELECTROSCOPE (ILE)**

Rex S. Rubidy

### **ABSTRACT**

This study aimed to construct and test the improvised leaf electroscope (ILE) for Physics Laboratory experiments. It was only limited on the construction and testing of ILE. The finished products replaced the existing electroscope and provide hands – on learning experience to the students. The Improvised Leaf Electroscope was made of Erlen Meyer flask as chamber. Its major parts were the following: a) the metal rod which will serve as the stem and the knob b) cork stopper which will hold the aluminum leaves mounted on the metal rod, and c) aluminum foil which will serve as the leaves. The materials needed are locally available and less expensive. Nine samples of ILE were constructed in order to

test which samples can produce the highest approximate angle of deflection. Three various ways of test were made with three trials for each testing. Results reveal that copper rod is the best metal stem to use with an approximate measured angle of deflection of  $26^{\circ}$ . The appropriate length of the rod is 6 inches with  $46^{\circ}$  approximate measured angles of deflection. And the suitable width of aluminum leaves is 0.5 cm with  $30^{\circ}$  approximate measured angle of deflection. In order to improve the operation of the ILE, it is highly recommended to produce a good quality of plastic rod and woolen cloth in order to attain maximum results and not to depend on the imported rod and cloth

## **DESIGN, CONSTRUCTION, AND TESTING OF MICROPROCESSOR-BASED ELECTRONIC LOAD CONTROLLER FOR MICRO-HYDRO SYSTEM**

Caesar Rico S. Acanto and Ramon A. Alguidano, Jr.

### **ABSTRACT**

Electricity is one of the most important needs in today's modern life. Almost every aspect of our life is influenced by the use of electricity. In an archipelagic country like the Philippines, bringing electricity to every home from the grid is a big challenge. Inaccessible areas must utilize standalone system to provide electricity to the communities. One of such system is the micro-hydro power (MHP) which uses water to power the turbine that drives the generator to produce electricity. One problem of standalone system is the variation of voltage and frequency when the system experiences variation of load. The increase of voltage and frequency is damaging to the connected load. To eliminate this problem, the micro-hydro system requires an electronic load controller (ELC) to maintain the voltage and frequency of the system at a varying load condition. The ELC has the

ability to detect fault in the power system providing a redundant protection to the circuit breakers and fuses. However, the availability of electronic load controller in the Philippine market is limited. The existing designs are imported and difficult to repair and maintain. This study aims to develop a locally fabricated Electronic Load Controller using microprocessor as its controller. The implementation of the design reduced the number of discrete components used in the construction making the design easy to maintain and repair. The use of microprocessor also allowed easy replication and on site repair. The ELC design was able to operate the MHP at the voltage level between 180V to 240V which is a safe operating voltage for electrical loads.

## CITIZEN SATISFACTION INDEX SYSTEM (CSIS) FOR A LOCAL GOVERNMENT UNIT IN THE PROVINCE OF ILOILO (2015)

By

Reynaldo N. Dusaran, Margen A. Java and Carolyn L. Yoro

Paper presented at **Thai Nguyen University in Vietnam** last July 16-28, 2014 and **13<sup>th</sup> Research & Development Week**, 17<sup>th</sup> CPU Faculty Research Symposium, March 11, 2016, Knowledge for Development Center, Henry Luce III Library, Central Philippine University

### EXECUTIVE SUMMARY

#### **About CSIS**

The Citizen Satisfaction Index System (CSIS), a component of the Local Governance Watch program, is seen as a starting point for citizens and civil society organizations to exact accountability from local authorities on service delivery performance. The institutionalization of the CSIS was in the context of the Department of Interior and Local Government's (DILGs) direction towards opening up more spaces for people participation in governance, to ensure more transparent, accountable and highly performing local governments.

The CSIS aims to undertake the following objectives: (1) to gather citizens' perspectives or views on the reach and quality of basic public services; and (2) to provide information handle for citizens and the civil society to allow an informed engagement in the workings of a local government.

Since CSIS was proven to be an effective tool in measuring the Local Government Units (LGUs) performance of their basic public services, it was initially implemented in selected sites in the country. One of the selected sites was a component city in the Province of Iloilo.

#### **Objectives**

The objectives of the study were to: 1). describe the socio-demographic profile of the respondents and their households, and 2) determine the awareness, availment, satisfaction and importance of the different public services provided by the local government unit, specifically on, a) health programs and services, b) basic education services, c) social welfare services, d) governance and response, e) public works and infrastructure, f) environmental management, g) agricultural support services, and, h) tourism promotion services.

### METHODOLOGY

The methodology used in the survey was based on the CSIS manual provided by the Department of Interior and Local Government. This study covered only Passi City, a component city in the Province of Iloilo. A multi-staged probability sampling design was used to determine the 150 target respondents in the LGU. The sample barangays for 30 spots were determined in coordination with the DILG CSIS Consultant. In each sample spot, sample households were selected using systematic sampling with a random start and in each sample household, a Kish Grid was used to determine the sample respondent from qualified household members. As basis for data gathering, the CSIS instrument prepared by the DILG was used. To facilitate better understanding of the respondents, the questions were translated into local dialect. This survey involved 25 out of the 51 barangays of Passi City for a total of 30 spots with five target respondents per spot. To ensure full and equal coverage of the survey area, the survey team was divided into two of 5 interviewers per team under a supervisor. All the data collected were processed using the Statistical Package for the Social Sciences (SPSS) Version 17. Data analysis was purely descriptive with the use of frequency and percentage distribution. The item and area net scores for the different items and service delivery areas were determined using the procedure in the CSIS Manual 2015.

### KEY FINDINGS

*Demographic Profile.* Based on the sampling technique used, half of the respondents were males with another half as females. They had a mean age of 47.71 years, married (74.0%), mostly household heads (44.0%), had been with the household for an average of 29.85 years, mostly high school graduates (24.0%), working (60.0%), and residing within the barangay or city (59.3%) with a mean monthly income of Php 4,824.71.

The households were composed of 3 to 6 members (62.7%) with a mean of 4.41 members. The households had a mean of 2.31 males and 2.19 females. Mean age of members was 39.72 years and mean monthly total household income was Php 10,088.55.

The majority (84.0%) of the households were not current beneficiaries of *Pantawid Pamilya* Pilipino Program (4Ps) and most of the households own their house and lot (43.3%). Their houses have floors generally made of concrete (40.0%), and walls made of strong materials (40.0%).

As to their basic utilities, the households generally owned flush/water-sealed toilets (86.0%), use deep well/artesian well water for drinking (39.3%), had own electricity connection (73.3%) and regarded television (81.3%) as primary source of news or the radio (56.0%) as source of news other than the television.

*Level of Awareness with Service Delivery Areas.* Among the different service delivery areas, governance and response had the highest awareness score (86.12), followed by health programs and services (79.83) and education programs and services (75.29). On the downside, tourism promotions service had the lowest awareness score (37.00), followed by agricultural support services (50.78) and public works and infrastructure (70.90) (see Table 39). The mean awareness score (67.84) for all service delivery areas is considered HIGH.

*Level of Availment of Service Delivery Areas.* Among the different service delivery areas, health programs and services had the highest availment score (65.67), followed by public works and infrastructure (57.10) and environmental programs (49.60). On the other hand, tourism promotions service had the lowest score (9.00), followed by agricultural support services (23.56) and social welfare services (35.56). The mean availment score of 42.24 for all service delivery areas is considered FAIR.

*Level of Satisfaction with Service Delivery Areas.* The data indicate that among the service delivery areas, highest level of satisfaction was on education programs and services (90.43), followed by health programs and services (89.33) and agricultural support services (89.00). The service delivery area with the lowest level of satisfaction was on tourism promotions service (79.40), followed by public works and infrastructure (79.95) and governance and response (81.38). The mean satisfaction assessment score for all areas (85.36) is regarded as VERY HIGH.

*Needs Assessment/Level of Importance of Service Delivery Areas.* In terms of the level of importance of the different service delivery areas, the data revealed that based on the importance score, health programs and services had the highest level of importance (91.25), followed by social welfare services (89.72) and environmental programs (89.10). The service delivery area with the lowest level of importance was tourism promotions service (77.20), followed by agricultural support services (85.67) and public works and infrastructure (87.50). The mean importance score for all service delivery areas was 87.20 and is considered as VERY HIGH.

## CONCLUSIONS

Based on the findings of the survey the following are concluded:

1. The respondents had a mean age of 47.71 years, married, mostly household heads, had been with the household for an average of 29.85 years, mostly high school graduates, working within the barangay or city with a mean monthly income of Php 4,824.71.

2. The households were composed of 3 to 6 members with a mean of 4.41 members, 2.31 males and 2.19 females, with a mean age of 39.72 years and mean monthly total household income of Php 10,088.55.

3. The respondents' households were not currently *Pantawid Pamilya* Pilipino Program beneficiaries, own their house and lot and their houses have floors generally made of concrete and walls made of strong materials.

4. The households generally owned flush/water-sealed toilets, use deep well/artesian well water for drinking, had own electricity connection and regarded television as primary source of news or the radio as source of news other than the television.

5. General level of awareness of the different service delivery areas is considered high, except for tourism promotions service, agricultural support services and governance and response which were considered as low, fair and very high, respectively.

6. General level of availment of the different service delivery areas is regarded as fair but high in health programs and services; low in agricultural support services and social welfare services; and very low in tourism promotions service.

7. General level of satisfaction of the different service delivery areas is very high which is true in all areas except in tourism promotions service and public works and infrastructure in which their level of satisfaction is high.

8. General level of importance of the different service delivery areas is considered very high, which is true in all areas except in tourism promotions service which is considered as high.

9. The need-satisfaction analysis show that all the services delivery areas fall under the high need-high satisfaction quadrant which implies that all the service delivery areas had demonstrated higher levels of satisfaction and were also considered as highly important by the respondents.

## GENERAL RECOMMENDATIONS

Based on the findings and conclusions of the survey, the following are recommended:

1. Since the income of the respondents as well as that of the households is relatively low, income and livelihood programs should consider improvements in income of the residents. Expansion of the beneficiaries to the conditional cash transfer program can be an immediate option.

2. Since the majority of the households are still dependent on deep well/artesian well and river/stream as sources of their drinking water, coverage of community water systems should be expanded to provide a safer source of drinking water to the majority if not all of the residents.

3. Since more than half of the respondents had members who got sick and more than half of the members who got ill were sick of influenza, incidence of illness in the city can be effectively reduced if preventive measures against influenza can be institutionalized by the local government in cooperation with the different sectors. Efforts must also be made in order for the residents to effectively avail of the health programs and services provided by the local government towards the prevention of this illness.

4. Given the very wide attendance of residents in public elementary and high schools due in large part to the proximity of their residence to the school and low if not free tuition, efforts must be made to sustain the educational programs and services to maximize its impact to the community.

5. Since a good portion of the respondents reported prevalence of crimes in their locality, crime prevention program should be sustained to keep the incidence of crime to a very minimal level if not to a zero crime rate.

6. Although the general level of awareness of the different service delivery areas is considered high, level of awareness in agricultural support services is only fair and low in tourism promotions service. Efforts must be made by the concerned units to ensure higher level of public awareness of their programs and services to facilitate availment of their programs and services, particularly in agricultural support services and tourism promotions service.

7. Although the general level of availment of the different service delivery areas is regarded as fair, level of awareness for agricultural support services and social welfare services is considered as low and very low for tourism promotions service. Mechanisms on how the public can effectively avail of specific programs and services should be reviewed and improved to

facilitate effective availment of these programs and services, most particularly on tourism promotions service, agricultural support services and social welfare services.

8. Since the general level of satisfaction of the different service delivery areas is very high which is true in all areas except in tourism promotions service and public works and infrastructure in which their level of satisfaction is only high, delivery of specific programs and services should be further improved to ensure higher levels of satisfaction, particularly in areas with lower levels of satisfaction.

9. Since the general level of importance of the different service delivery areas is considered very high, which is true in all areas except in tourism promotions services, efforts must be made to effectively deliver the services to ensure that the need for specific services maybe responded to effectively. Concerned agencies of the LGU should likewise review why their programs and services in their respective areas are regarded as less important over the other programs and services to plan out strategies to increase the level of importance of their service delivery areas.

10. Since all the services delivery areas fall under the high need-high satisfaction quadrant, which implies that all the service delivery areas had demonstrated high levels of satisfaction and were also considered as highly important by the respondents, the LGU should maintain if not improve further its services delivery in all the areas with special emphasis on tourism promotion services and public works and infrastructure.

11. The different recommendations of the respondents to further improve the delivery of the different programs and services of the local government unit should be looked into and duly considered for relevant action. \*

”**YOUR WORK** is going to fill a large part of your life, and **THE ONLY WAY** to be truly satisfied is to do what you believe is **GREAT WORK**. And the only way to do great work is to **love what you do**. If you haven't found it yet, **KEEP LOOKING, AND DON'T SETTLE**. As with all matters of the heart, you'll know when you find it.”

*Steve Jobs*

## Completed Institutional Researches

1. **Adaptability and Horticultural Characterization of Different *Moringa* Accessions under Local Conditions (Study II – Adaptability Trial, Greenhouse Study)**  
- By Hope G. Patricio (completed August 2015)
2. **Ilonggo Perceptions on the Extent of Patronage Practices and their Attitudes Toward Intra-Familial Succession in Iloilo**  
- By Ernesto S. Saquibal, Jr. and Ma. Lindy B. Saquibal (completed October 2015)
3. **Tracer Study for the CARES Graduates from 2006-2010**  
- By Reynaldo N. Dusaran (completed October 2015)
4. **Efficacy of Different Green Manures and Commercial Organic Fertilizers on the Growth and Yield of Potted Leaf Lettuce and Cabbage and Their Residues on Lettuce and Pechay**  
- By Ma. Victoria C. Seredrica (completed November 2015)
5. **Students' Satisfaction on and Perceived Importance of Institutional Services of Central Philippine University**  
- By Florabel S. Suarez and Gift D. Tragico (completed November 2015)
6. **The Effect of Reflective Journal Writing to Student's Critical Thinking and Mathematical Communication Skills (completed January 2016)**  
- By Merle L. Junsay and Edgardo P. Gerada
7. **Extent of Deterioration and Formation of Toxic Substances in Cooking Oil (Coconut Oil) when Heated Repeatedly Above Smoke Point**  
- By Ma. Mercy A. Japitana (completed March 2016)
8. **Impact Survey on the CPU Integrated Outreach Activity for Barangay Ilongbukid, San Rafael, Iloilo**  
- By Aries Roda D. Romallosa, Hope G. Patricio and Margen A. Java (*draft report*)
9. **Design, Construction, and Testing of Microprocessors-Based Electronic Load Controller for Micro-Hydro System**  
- By Caesar Rico S. Acanto and Ramon A. Alguidano, Jr. (*draft report*)
10. **Tracer Study for the CPU College of Theology Graduates from 2006-2010**  
- By Excelyn C. Landero, Rea Angelica F. Villeza and Grace C. Reyes, (*draft report*)

## Ongoing Institutional Researches

1. **Perceived Stress and Coping Behaviors in Clinical Practice of Nursing Students' in Central Philippine University**  
**Researchers:** Carolyn L. Yoro, Ma. Analiza G. Balgos, Cynthia J. Mendoza, Rosita N. Saldajeno, Susan A. Sumande and Janette E. Yap

## Completed Externally Funded

1. **Establishing Baseline Information for Organic Agriculture in Panay and Guimaras, Philippines**  
- By Reynaldo N. Dusaran and Manuel C. Palada  
Funding Agency: Department of Agriculture, Regional Field Office 6 (completed September 2015)
2. **Monitoring and Evaluating the Impact of Teen Centers Among Adolescents in the Province of Capiz**  
- By Margen A. Java, Reynaldo N. Dusaran, Raquel L. Polec-ee and Gift D. Tragico  
Funded by Local Government Unit of Capiz (completed April 2016)

## Ongoing Externally Funded Researches

1. **Identification, Collection, Propagation, and Processing of Herbal Plants for Organic Native Chicken Flock**  
- By Jaime C. Cabarles, Jr.
2. **Performance Evaluation of Selected "Bisaya" Chickens as Potential Breeding Stocks**  
- By Jaime C. Cabarles, Jr.

# Director's Desk



By DR. REYNALDO N. DUSARAN

## Team for a Theme in Research

As an autonomous university, the quest for maintenance of this status is a must. One of the areas to maintain this status which is considered as weak is the area of research. To address this concern, it is imperative that more faculty members have to be involved in research. It has to be likewise recognized that greater faculty involvement in research will mean more research output, more papers for presentation and more papers for publication.

To facilitate greater involvement of faculty members in research, a thematic approach in research will be pursued with a team for each theme organized. Given a theme, faculty researchers from different relevant units/colleges of the university will be identified and organized. As a process, the team should be able to identify specific researchable areas related to the theme which can be handled by specific members of the team. Through this approach, most if not all the research concerns for a theme could be addressed in one setting and thereby allowing a more comprehensive understanding of the theme understudied. This approach will also paved the way for a thematic presentation of research outputs and thematic bases for the publication of research papers.

It is also seen that through this approach the

team members would be able to help each other in developing their proposals and research reports by sharing theories, literatures, methodologies and other commonalities brought about by the commonality of the theme but still maintaining the scholarly integrity of each specific research output. Through this approach, hopefully more faculty members will be involved in research.

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