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A GUERILLA RESEARCHER'S JOURNEY IN MANAGING INNOVATIVE PROCESSES: THE CASE OF THE MMSU BIOENERGY R&D MANAGEMENT

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ABSTRACT – This paper discusses the different research and development processes undertaken by a pioneering bioenergy researcher particularly bioethanol towards sustainable community development. Specifically, it describes the innovative processes through a qualitative narration of experiences in coming up with a national bioenergy research and extension for sustainable development (NBioERESD) program. Based on this, the NBioERESD Program provides an avenue of reflective discourse on effective and efficient research management along the areas of generation of resources, human resource development and management, physical facilities management including equipment utilization and dissemination of research and development results.

The significant milestones served as the basis in developing a strategic framework for research and development (R&D) program in an emerging center of academic, research and development excellence in the bioenergy community of interest and practice. The case of the Mariano Marcos State University (MMSU) is discussed in detail to highlight the different aspects of management from planning, coordinating, organizing, implementing and control of program activities and breakthroughs.

Response to global challenges and trends enabled the researcher, program team and its institution to work in achieving the vision, mission and goals coined as ACHIEVE for the next 10 years.

Keywords: Innovative processes, community development, bioenergy, research management, excellence, strategic framework

INTRODUCTION

The journey of a dynamic and innovative researcher never ends in just having conceptualized a simple idea turned into a workable proposal, implemented as planned, generated relevant information, developed a technology and published research results and findings but rather it is beyond these which goes around into a cycle of innovative process. As such, the most important thing is the collective variety of lessons learned and experiences necessary in improving the next step of research management processes.

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As revealed by years of research project implementation, notable research processes captured the growth and development of the researcher including the influencing factors required in coming up with cutting-edge breakthroughs.

The research is a narrative documentation and analysis of the pioneering research work on biofuel specifically the use of nipa feedstock as a source of bioethanol conducted by the so-called Guerilla Researcher. These work activities were used to present and describe the different phases in undertaking a well-coordinated, systematic and organized research.

The main objective was to determine the different activities related to bioethanol research towards the formulation and development of the national bioenergy research and extension for sustainable development (NBioERESD) program in the Philippines. Specifically, it describes the qualities of the guerilla researcher who adheres to the different research processes, earned lessons and experiences which were used and analyzed for improved bioenergy research management framework in the university.

Based on this, the NBioERSD Program provides an avenue of reflective discourse on effective and efficient research management along the areas of generation of resources, human resource development and management, physical facilities management including equipment utilization and dissemination of research and development results.

METHODOLOGY

The life of an innovative bioenergy researcher, particularly dealing with bioethanol, is a challenging one. This section presents the different areas of understanding and capturing the different stages of research processes undertaken by the guerilla researcher including the formulation and development of the national bioenergy research and extension for sustainable development program.

Conceptual Framework

The coordination and management of the bioenergy research and extension for development program is observed as an evolving, dynamic and scientific manner. As a basis for analyzing the different processes and strategies used, the researchers used the developed framework through a constructivist perspective to organize and systematize the different factors in coming up with conclusive interpretation of understanding the “guerilla researcher’s journey” at the same time the different historical events engaged in and participated in by the Mariano Marcos State University (MMSU) Bioethanol Team to establish the National Bioenergy Research and Extension for Sustainable Development (NBioERESD) Program. There are three areas analyzed and interpreted in the research process, namely: the researcher’s sphere, the bioscience research and extension for development sphere, and the NBioERESD Program sphere. All three spheres were analyzed within the concept of research management and coordination.

Narratives shared by the guerilla researcher’s life experiences including the MMSU Bioethanol Team were reviewed and interpreted to organize the different factors detailing significant events in the development of MMSU’s National Bioenergy program as shown in Figure 1.

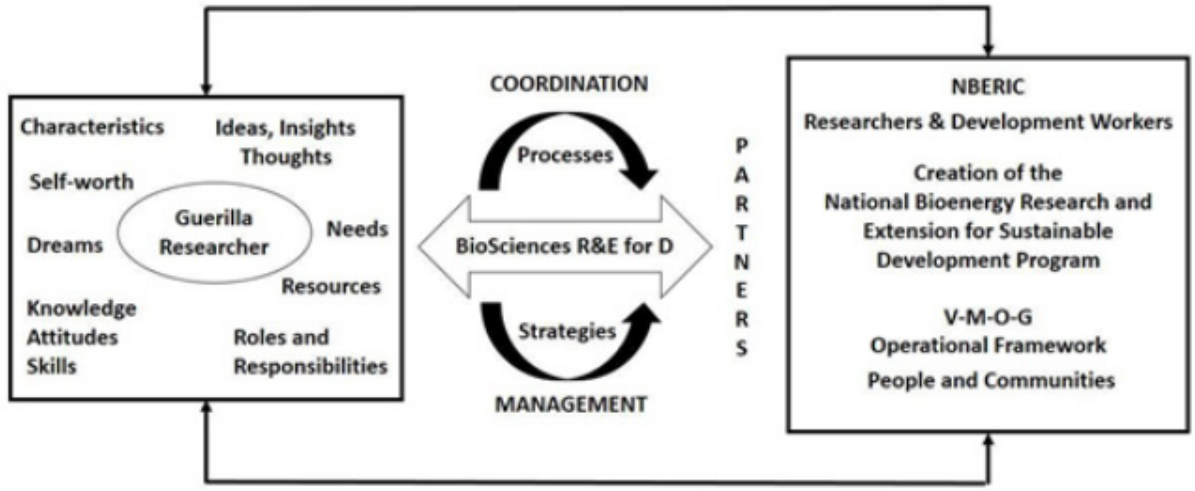

Figure 1. The dynamic interrelationships of the influencing factors in the coordination and management of the bio-scientific research landscape followed/used by the researchers (Agrupis & Aquino, 2018).

Research Methods and Processes Used

The research was undertaken for a period of eight months using a complete qualitative methodological approach to describe and determine the different contributing and limiting factors in doing research. Also, it was analyzed and interpreted with the overarching framework of research management as viewed within the components of technical resources particularly the human resources (researchers, institutional partners, people and communities and the different stakeholders), physical resources (simple laboratory facilities and equipment) and the knowledge optimization to produce quality research results and products.

Specifically, the researchers used key informant interviews, participant observation, content and historical analysis, focus group discussions and case study. The bioenergy research processes and strategies were critically analyzed and systematically interpreted to show the constructivist paradigm through narratives, research reports and documents, activities, life experiences and events of the "guerilla researcher" and the participation of the MMSU Bioethanol R&D Team towards an empowered research team. It used heavily on reflective analysis to describe, analyze and interpret the researcher's journey.

In addition, the collected narratives were coded and categorized into thematic areas highlighting the different components and aspects of research management. Using the theoretical and operational frameworks on Practical Management of Drucker (1973), McKinsey's 7S Management of Waterman and Peters (1980), and social research scientific process of Denscombe (2010) as cited by Aquino (2015) on scientific rationalization perspective, and the researchers' scientific competencies and capacities; the MMSU Bioenergy Research Management System was developed to address the different challenges of bioenergy particularly bioethanol resource generation, community engagement and empowerment, partnership building and research competencies and culture of excellence.

Although several areas of concerns were reviewed along bioenergy, it was limited only to bioethanol research interest because of the extent of the "guerilla" researcher's exposure and availability of quantitative and qualitative research documents obtained.

RESULTS AND DISCUSSION

The Guerilla Researcher

Over the years, the role of a budding researcher evolves in response to the trends and challenges identified, formulated and translated into research, development and extension agenda, plans and programs. One of the RDE Agenda and Plans developed by the Department of Agriculture-Bureau of Agricultural Research (DA-BAR 2017) is the inclusion of nipa and other sources for bioenergy. The document revolutionizes the competence of the guerilla researcher in developing relevant research proposals and projects.

Characteristics of the Researcher

> *"As a guerilla researcher, I can say that I have grown to be independent and innovative in meeting the challenges of my technical field of specialization while maintaining a balance of work and family affairs."* - Shirley C. Agrupis, 2015

The statement presented led to the description and identification of specific traits and characteristics of the guerilla researcher. These were repeatedly mentioned in the implementation of bioethanol research projects as well as confirmation of research partners according to the RESEARCHER'S SELF. Understanding and knowing the self is the ultimate factor in defining a successful and innovative researcher which includes the criteria/qualifications necessary in managing a research project. The description of the guerilla researcher in one statement is "overly prepared in full battle gear."

Specifically, the following are the identified characteristics:

- ***Systematic and organized*** – the researcher follows a step-by-step procedure of scientific inquiry in meeting the challenges amidst climate change, globalization, trends in renewable and bioenergy research and development;
- ***Dynamic, critical thinker and problem solver*** – the researcher responds to situations and conditions that affect the smooth implementation of projects and activities. She thinks rationally and presents ideas and innovation with her research team and partners in order to get things done. In so doing, she decides with objectivity and rationality for the good of the research team, project and activities;
- ***Resourceful and initiator*** – in support to being dynamic and organized, she ensures to find available resources needed to implement the processes and activities of the project. She looks for ways-and-means to guarantee that every step and outputs are delivered on time and of quality. She exudes a vibrant persona to inspire and mobilize people within her circle and network.
- ***High level of emotional attributes*** – positive disposition and outlook is what the researcher possesses. Emotional maturity and independence complement her competence and confidence which enable her to touch base and establish networks that led to the development of new researchable areas in her field of specialization.
- ***A sensitive-yet-charismatic leader*** – she exudes the charm of an accomplished research leader through her projects and activities.
- ***Possess conceptual and methodological attributes in program planning*** – the researcher provides several ideas and innovations coupled with techniques in drawing new areas of quality research.
- ***Practice culture of research excellence and dedication –*** she established a high level of standard in achieving and pursuing quality research which led to recognition and awards.

Analyzing the Researcher's Traits in Bioenergy RDE Management

Defining the researcher's life was made easy while interpreting the traits in managing the processes in research implementation. These traits were classified into two aspects; positive and negative. The positive traits were used to push further in meeting the requirements and challenges in implementing bioethanol research. The researcher's perspective about conceptualization, planning and programming greatly improved the processes based on the outputs of the research projects. It enhanced the skills and strategies of resource management dealing with human and financial support, maintenance of a small laboratory facility which triggered a slow but progressing accumulation of laboratory equipment.

Furthermore, the positive traits resulted in identifying research sites including people and communities who were interested to be part of the whole bioethanol process. The research sites identified were communities in Pamplona, Cagayan with massive nipa stands. The nipa plantation became the source of raw materials in the production and processing of bioethanol. However, way back in 2006, the guerilla researcher started working on sweet sorghum through the financial support of DA-BAR. The research became revolutionary which started the journey of the guerilla researcher to be adaptive and resourceful to the meager resources available in coming up with viable research results in biosciences, bioenergy and sweet sorghum as an alternative source of raw material.

In addition, the processes led communities to engage more in community-based bioscience research. Institutional partners started coming in to work with the guerilla researcher and Mariano Marcos State University. International and national research institutions like ICRISAT, Department of Energy, Department of Agriculture, Department of Science and Technology including the energy industry committed and offered technical and financial support to start the bioethanol community of interest and community of practice.

Documentation and preparation of quality research outputs came next complemented by reaping of awards and recognitions given by scientific RDE giving bodies to the guerilla researcher on its pioneering research work in Philippine Bioethanol Research and Development. The awards came on after the other from the National Research Symposium of the Department of Agriculture-Bureau of Agricultural Research (DA-BAR), Department of Science and Technology-Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (DOST-PCARRD), Department of Energy (DOE), National Academy of Science and Technology (NAST), and the Commission on Higher Education (CHED) including duly recognized professional societies and associations in the country and abroad. Such awards also triggered an effect on the establishment of research collaboration with international and national academic and research institutes in Japan, United States, India and Philippines Higher Education Institutions.

On the other hand, the collective negative traits of the bioethanol research team led to complemented efforts and addressed issues and concerns to implement the research projects in a holistic manner which as observed did not affect in any way the processes undertaken by the guerilla research as well as the team and its partners.

Significant observations were pointed out by implementing partners such as the laying out of a blueprint for bioethanol RDE program in the university as well as the creation of a sectoral research agenda highlighting the importance of including an innovative science and technological breakthrough using nipa feedstock supported by the Ethanol Producers Association of the Philippines and the Bioethanol Industry in the country (MMSU Annual Reports, 2013, 2015 and 2015) and (MMSU-USAID STRIDE Project Completion Report 2017).

The Learning Process

The guerilla researcher's journey is not completed without the technical and administrative support, management experiences and mentoring of individuals who shaped and molded the competence and confidence in managing the innovative research processes.

The following are the major lessons obtained in pursuing the bioenergy research management processes:

1. Maintain balance and focused research life – as a researcher, life should be given a balance of continuous interaction and relationship with colleagues, partners and family;
2. Taking leadership – as the pioneer researcher, leading by example was the direction followed by the team of bioenergy researchers. She has set the level of standard to adhere to the culture of excellence through creativity, innovativeness, decisiveness and humility;
3. Coordinative and managerial influence – the lessons associated in managing the bioenergy is taking a facilitative and aggressive role to get things done. The research followed a clear plan in achieving and obtaining quality outputs;
4. Adhering to scientific inquiry and maintaining a high level of research ethics – the work of the researcher and her team ensured that all processes must be followed according to plan. However, flexibility, creativity and innovativeness are encouraged without sacrificing ethics in dealing with people, quality work and obtaining desirable outputs and outcomes;
5. Quest for new learning – in support of a culture of excellence, the researcher continued to search for new ideas, processes and strategies in making the bioenergy research more attuned and at par with the rest of the world. Establishment of linkages became natural after several attempts to obtain resources to maintain and operate the projects;
6. Work with existing resources by producing relevant and technological breakthroughs – the simple research laboratory became an inspiration to strive harder to dream big; one day the dream of having a better research facility will come; and
7. Seek guidance and divine intervention – the researcher's self is continually guided by prayers, offering of praise and testimonies directly towards reflection of godly lessons and experiences. These resulted in inspiration to maintain the culture of research excellence.

The lessons learned in the process of bioethanol research were analyzed and interpreted based on the holistic system of research management (Cuyno 1998). These were further analyzed from the perspective of community development by revealing the effective roles of a development worker. Specifically, the roles and responsibilities of the guerilla researcher and her team is aptly coined as MOLDERS in development work (Aquino 2010). The acronym MOLDERS was used in analyzing the lessons learned which briefly mention the work necessary in doing the research management in relation to community development work which the present bioenergy program is anchored.

- ***Management*** – people's capability particularly the different competencies in doing research;
- ***Organizing*** – people's prerogative to organize which research process is the initial stage of activities;
- ***Leadership*** – wider base of decision-making to set the direction of the research work;
- ***Development Planning –*** participatory process with all key players and stakeholders to encourage commitment, responsibility and accountability;

- ***Evaluation*** – participatory evaluation system as a regular work to document life experiences and lessons learned especially the researchers insights;
- ***Research*** – documentation of development of innovative models, practices and programs
- ***Shared Knowledge*** – Dissemination of Technologies and Innovations for productivity, profitability and sustainability

The MMSU Bioenergy R&D: Past, Present and Future

Sustainable use of energy and selection of cleaner energy sources are effective ways to achieve green growth and address global environmental challenges. To support this, a number of laws have been passed by the Philippine Program to support the use of renewable energy including the Electric Power Industry Reform Act (2001), which promotes the use of local and sustainable energy sources to replace imported fossil fuel sources; the Biofuels Act (2006), which encourages the use of biomass fuels; and the Renewable Energy Act (2008) and the Climate Change Act (2009), which provide a legal basis for the tackling of climate change through sustainable development. These have resulted in a significant degree of cooperation among private companies producing renewable energy, many of which have contracts with the Philippine Government.

Unfortunately, due to limited expertise in the field, there is a dearth of bioenergy research being done in the country, specifically in state universities and colleges. Given these limitations, a unifying unit is required to pool all the efforts in manpower complementation, facilities development including research, extension, development and commercialization of bioenergy with more focused, outcome-based and client-oriented strategies and initiatives.
Through the years, MMSU has worked in developing clean, renewable and sustainable energy to boost sustainable development and energy security and reduce carbon emissions in communities not to mention its pioneering innovations in research and development, education and training.

In 2005, MMSU took the role in bioenergy which resulted to its pioneering work on sweet sorghum in renewable energy research and development and extension initiatives; development of technology in producing 95% azeotrope ethanol (MMSU 95hBe) from sweet sorghum (2009); making of 20% gasohol blend using 95% azeotrope ethanol without phase separation (2010) paving the birth of MMSUhBE20 (2011); and bulk production of 95% hydrous ethanol for MMSUhBE20 gasohol formulation to run spark ignition engines (2012). In 2013, PhilRice awarded MMSU a 6-month research grant to adapt the MMSU 95% bioethanol production technologies using nipa sap as feedstock in support of their fossil-fuel free rice farming program. Based on these development works, institutional, technical and support services were provided by the Department of Energy (DoE), Department of Science and Technology (DOST) – Balik Scientist Program, Department of Agriculture (DA) and USAID STRIDE, Fullbright Visiting Fellows, to name a few.

With the increasing demand for bioenergy research, development, extension and education, MMSU's critical role is necessary to come up with a comprehensive, integrative, holistic, organized and systematic plans and programs that cultivate dynamic partnerships, globalization, competitiveness and internationalization. The inclusion of relevant and responsive institutions to the call of unified bioenergy research and development is a start in drum beating a higher educational institution-led Model in Energy Self-sufficiency that propels productivity, profitability and sustainability.

The initial phase of the program is to operationalize the bioenergy research and education

innovations for sustainable development highlighting the development of capacities and competencies of individuals, institutions and communities and empowering them to the fullest. As the program progresses, all activities will be institutionalized to revolutionize and revitalize all efforts of key players and stakeholders especially those working in rural areas where the resource-base of the raw materials as well as the needed capability for progress are necessary for socio-economic development.

MMSU's bioenergy research and development is a reflection of the guerilla research team's journey as they experienced the birth pain of producing and processing of bioethanol; and expand through their strong will and free-spirit yet creative, risk taking, resourcefulness and passion into action. To top it all, the remarks of the original guerilla researcher made the difference...

> *"There is no sweeter blessing gained in this undertaking than reaping the first drop of bioethanol in a makeshift yet comfortable research laboratory. While we are working with our candle lights in the wee hours just to produce our outputs, we know that we can do it to show there is an exciting place in this part of the country where we call ourselves, the guerilla researchers; yes we made it and can do more. Now we are working hard to be challenged that there is no looking back but moving forward as we never sit on our laurels." Shirley Agrupis, 2018*

Shaping the MMSU Bioenergy Research Management

In response to the increasing challenges and interests in bioenergy, MMSU established and created the National Bioenergy Research, Development and Extension (NBioERDE) network composed of State Universities and Colleges (SUCs) in the country executed through a covenant of partnership (COP) signed on 26 January 2018 during the 40th Foundation Day Celebration at the University Hostel, MMSU, City of Batac, Ilocos Norte.

The COP serves as the binding agreement of understanding by the participating SUCs while adhering to the national bioenergy research and extension for sustainable development program operational framework and guidelines.

The NBioERDE Network is led by MMSU and actively supported by Aklan State University (ASU), Cagayan State University (CSU), Central Luzon State University (CLSU), Marinduque State College (MSC), Pangasinan State University (PSU), Western Philippines University (WPU), and the University of Antique (UA). These partner members were called the "magic seven" as the representation of seven glowing stars that bring new hope and aspiration to the bioenergy research and extension for development in the country. MMSU's leadership will bring these institutions to greater heights. As observed, the number seven is rightfully symbolic as "LUCKY SEVEN" because the pioneer bioethanol guerilla researcher is the 7th president of the university.

> *"The challenge to all of you is to work together. We believe that this is just the beginning of a more exciting and relevant work in keeping up with our time. MMSU taking the lead in bioenergy research and development will certainly make the difference. I am confident that you will all do well with this partnership. I will surely support all the way." - Senator Sherwin Gatchalian, 2018*

Establishment of the Covenant of Partnership

Purpose. Establishment, creation and development of the COVENANT OF INSTITUTIONAL

PARTNERSHIP supportive to the National Bioenergy Research, Development and Extension (NBioERDE) Network duly recognized and supported by all implementing and partner agencies for the operationalization and institutionalization of a comprehensive, unified and integrated program in the development, commercialization and knowledge dissemination and exchange of technologies and resources.

Program. The NBioERDE Network shall coordinate, manage and implement the programs, projects and activities of the Bioenergy Research, Development and Extension through the "One-Program Community of Interest (COI) and One-System Community of Practice (COP)" Platform and Modality of Sustainable Development.

Goal. To develop and empower communities through bioenergy research, development, extension, education and training for sustainable development

Ultimate Outcome. Transformed and Empowered Communities using Bioenergy Technologies through Innovative Knowledge Management and Business Entrepreneurship for Sustainable Development

The National Bioenergy Research and Extension for Sustainable Development Program

The development of the National Bioenergy Research and Extension for Sustainable Development (NBioERESD) Program is anchored on the initiative of the guerilla researcher of seeking financial support from Senator Sherwin Gatchalian who allocated and gave MMSU with a beefy amount to establish the National Bioenergy Research and Innovation Center (NBERIC) that will implement the program. Even without the NBERIC structure in place, the MMSU bioenergy team and its partners are operating and implementing full blast towards achieving a sustainable production and processing of bioethanol by communities and identified stakeholders.

Strong coordination and management led by the guerilla researcher define the success of the NBioERESD Program. The details of the program are presented and described below:

> Goal: To develop a cadre of applied community of interest (COI) and community of practice (COP) on bioenergy research, development, extension, education and training for sustainable development
>
> Objectives
> General:
> - To institutionalize a nationwide bioenergy development program that supports reliable, sufficient and sustainable community development
>
> Specific:
> - To develop a national bioenergy research, development and extension agenda, plans and programs for all
> - To provide a common platform and modality of bioenergy development initiating and enhancing creativity, innovativeness, competitiveness, progress and dynamic partnership
> - To determine and identify innovative and challenging potentials of bioenergy technologies, services and outputs for production, profit and marketing
> - To establish, create and capacitate all key players and stakeholders (researchers, educators, development workers, policy makers, and communities) in bioenergy for countryside development through bioenergy research, development, extension, education and training

- To strengthen institutional capacities and competencies of all involved in bioenergy for institutional partnerships and community development

Expected Outputs

- Comprehensive and unified National Bioenergy Research, Development and Extension Agenda, Plans and Programs (NBioERDEAPP);
- Developed common platform (One-Program COI and One-System COP) and modality (SUC-led Model in Energy Self-sufficiency) of bioenergy development enhancing creativity, innovativeness, competitiveness, progress and dynamic partnership;
- Utilized innovative and challenging potentials of bioenergy technologies, services and outputs for production, profit and marketing;
- Capacitated and empowered key players and stakeholders (researchers, educators, development workers, policy makers, and communities) in bioenergy for countryside development through bioenergy research, development, extension, education and training; and
- Revitalized and strengthened institutional capacities and competencies of individuals, institutions and communities involved in bioenergy RDE for institutional partnerships and community development.

Operational Program Framework

The program is implemented through a development platform and modality of "One-Program Community of Interest (COI) and One-System Community of Practice (COP)" for key players and stakeholders in bioenergy research, development, extension and education at the national, regional and local levels. It is supported by technical and financial support services provided by national, regional and local government units as well as non-government organizations and interest groups and the private sector.

It is coordinated and managed by a Program Director supported by a Program Leader. At the local level, identified institutional partners will serve as Project Leaders and or their representatives in the implementation of plans and programs related to bioenergy including institutional capacity building activities.

Also, the program follows collegial, proactive and participatory implementation strategies focused on resource-and technology-based, client-oriented, outcome-based institutional partnerships between and among individuals, institutions and communities involved. At the same time, it adheres to the principles of community development enhancing the developed platform and modality for an integrated, holistic, dynamic and systematic operation.

Participatory implementation, regular collegial review, monitoring and evaluation shall be installed to support the developed Bioenergy Research, Development and Extension Agenda, Plans and Programs to ensure that all activities are aligned and implemented accordingly to using appropriate and timely release of funds subject to existing accounting and auditing procedures, rules and regulations.

In order to sustain operation, all implementers shall identify, prepare, and develop plans, programs, activities and innovations through effective and efficient technical and budget planning. All developed plans and programs shall support the initial activities and later on be institutionalized using sustainability plans for succeeding institutional activities.

All pertinent outputs and outcomes of the program and project activities shall be subjected

to technology assessment and intellectual property which in turn be a joint ownership of and duly recognized of all those involved in the developed technologies (product, process, service, system and practice).

Program Platform and Modality

The "One-Program Community of Interest (COI) and One-System Community of Practice (COP)" platform and modality is a combined intervention highlighting the strengths of involved institutions emphasizing on existing and available resources in creating innovations in research, development, extension and education towards teaching-learning processes. The Community of Interest (COI) of key players and stakeholders shall be guided by the participatory principles in localizing and creating awareness for productivity, profitability and sustainability. The implementing partner institutions will use the MMSU Model in Energy Self-sufficiency for sustainable development in the communities.

In support to COI, the Community of Practice (COP) shall be guided by technology development and commercialization principles following the transfer of reliable, acceptable, and applicable interventions technologies for business and enterprise development. Both the COI and COP principles will encourage active involvement for an empowered key player and stakeholders at all levels of program implementation using the NBioERDE Agenda and Programs and System Operation.

Operational Program Structure

The program is managed and implemented using the operational program structure. The MMSU spearheads/orchestrates the coordination and management of the NBioERESD Program with the identified SUCs in the country. It is headed by a Program Director. A Program Management Unit (PMU) is slowly being established to be manned by a Program Leader together with the PMU support staff in the implementation of the different program components. Figure 2 shows the operational program structure of the NBioERESD Program for the smooth development planning, implementation, monitoring and evaluation of bioenergy sustainable development.
In order to properly implement the Program, MMSU through the Program Director created the Program Advisory Committee (PAC) that oversee the technical and management of the program in the areas of Bioenergy Research and Development, Institutional Development including capacity building and competencies, Community-based Innovation, and Business and Entrepreneurship.

Alongside the PAC, the NBioERESD Support Service (BioERESDSS) Providers will work to enhance the technical and social development mechanism of the Program coming from national partner institutions like Commission of Higher Education (CHED), Department of Energy (DOE), Department of Science and Technology (DOST), Department of Agriculture (DA), Department of Trade and Industry (DTI), Department of Environment and Natural Resources (DENR), Department of Education (DepEd), Department of Social Welfare and Development (DSWD), Department of Interior and Local Government (DILG) and the Department of Health (DOH). At the same time, non-government organizations, interest groups and private sectors are also tapped to provide technical expertise and specialization.

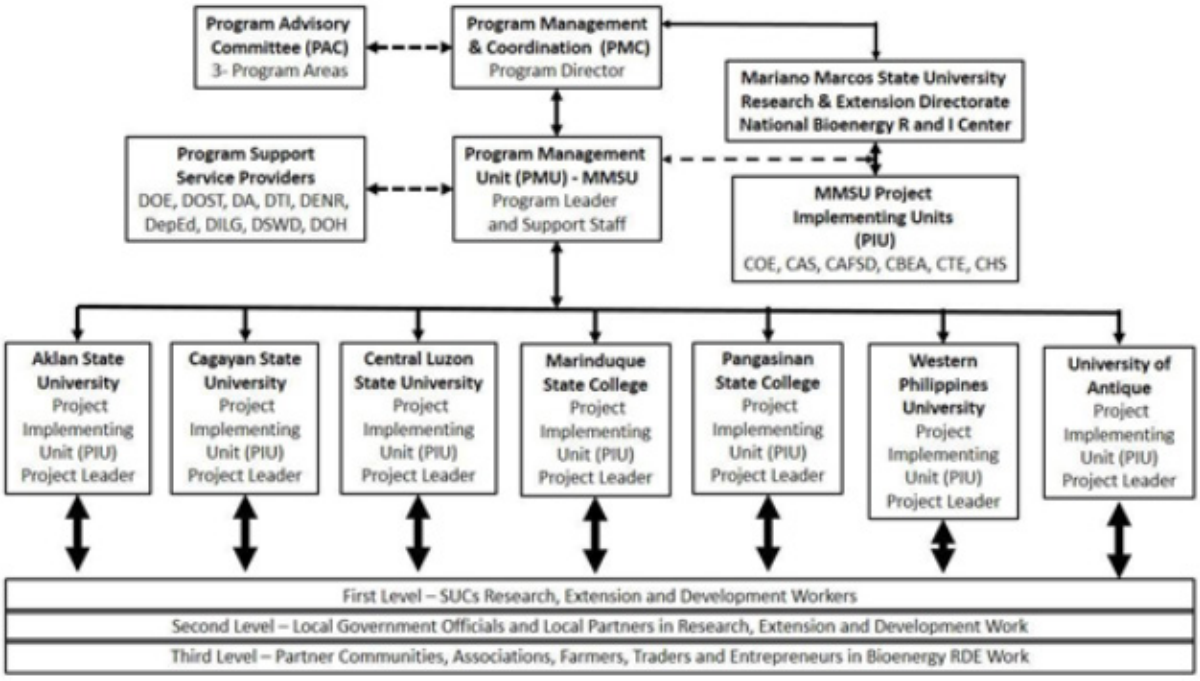

Figure 2. Operational program structure of the NBioERESD Program

Through the different implementing units of the University, the Research and Extension Directorates and involved colleges will have equal opportunity in the Bioenergy Research and Extension for Development Program together with their respective regional/provincial SUC counterparts in the country especially for science-and technological-based and community-based bioenergy sustainable development.

BioERED Technical Team shall be established and created directly under the PMU based on the identified implementing units at the field level to ensure program activities are synchronized and implemented as planned. The head of the partner institution shall create the institutional BioERED Technical Team which serves as the focal unit for coordination and implementation of project activities at the local levels.

The key players and stakeholders of the BioERED Program shall be implemented in three levels. The first level are the SUC-based research and extension arms; second level are the different local implementing colleges and units; and the final level are the clientele-partners and beneficiaries at the community or field areas where the innovations and development interventions are provided, administered, implemented, monitored and evaluated.

The operational program structure is set to be followed according to agreed technical and financial requirements of all implementing units subject to existing procedures, rules and regulations. Furthermore, it could be subjected to review and revision provided that it follows standard protocols and procedures duly agreed by all concerned and involved institutions and communities.

CONCLUSION

One's life journey is never complete without the ups and downs. The innovative processes and lessons learned by the guerilla researcher together with her team revealed that anything is possible. The characteristics and traits surely helped put in place the overall NBioERESD Program to where it is right now. Other evolving processes must be continuously documented by the participating researchers as they all believe this is a revolutionary work in Philippine research and development.

The challenges of the researcher paved the way to be on top as noted that the simple researcher became the head of a dynamic higher education institution. Through her passion and dedicated work she coined the acronym ACHIEVE to set the tone in her administration. After all, the guerilla work to respond to global challenges and trends enabled the researcher, program team and its institution to work in achieving the vision, mission and goals coined as ACHIEVE for the next ten years. ACHIEVE revolves as innovative processes followed by all at Mariano Marcos State University through innovative scientific research and extension for development system in implementing the National Bioenergy Research and Extension for Sustainable Development Program for the years to come.

Finally, the results of this qualitative research resulted in the development of a new construct of bioenergy research management interaction based on the derived influencing factors affecting the guerilla researcher's response to the innovative processes done in the new program of bioenergy in the university and country as a whole which flows in an orderly and cyclical manner (Figure 3).

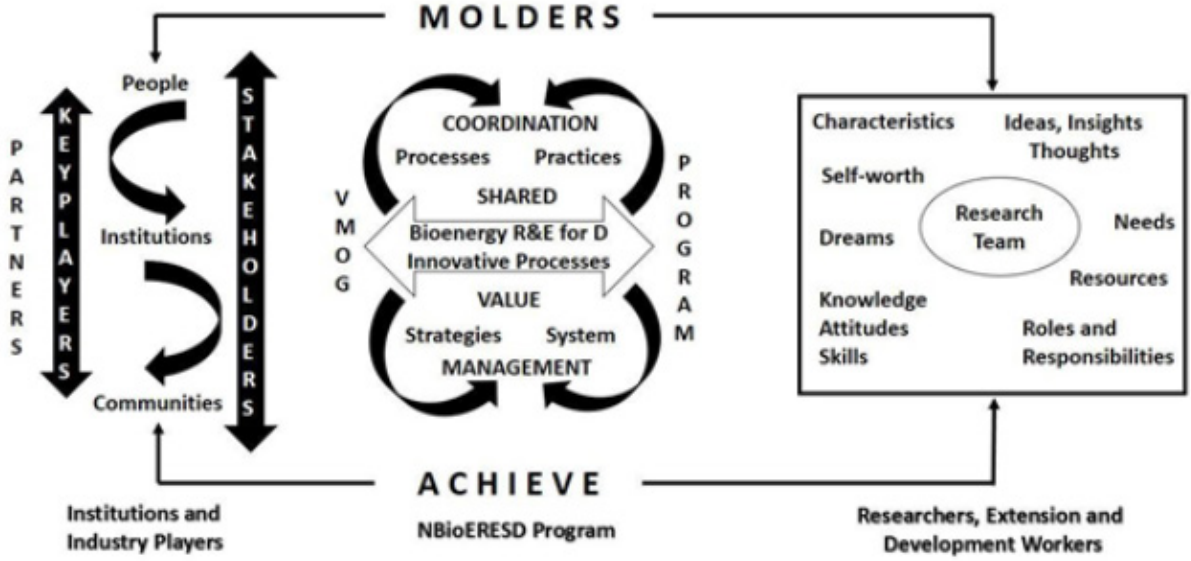

Figure 3. Development of a new construct of bioenergy research management interaction based on the derived influencing factors affecting the guerilla researcher's response to the innovative processes (Aquino and Agrupis 2018).

REFERENCES

Aquino, M. U. 2010. Community Development Teaching-Learning Module for CD 201. Benguet State University – Open University, La Trinidad, Benguet, Philippines.

Aquino, MU. 2015. Training Module on Social Research Methodology. Powerpoint Teacher-Learning Material. FRAMES Development Program, La Trinidad, Benguet, Philippines.

Agrupis, S., R. Ulep, N.Mateo, R. Ascano, M.C. Birginias, M. Valencia,M. Remulacio, M.P. Lucas, H.L. Layaoen, and F. Abenes. 2011. MMSU Hydrous Bio-ethanol I: Production, Characterization and Testing. Paper presented at the NSARRD, PCARRD, Los Baños, Laguna.

Agrupis, SC. 2018. Opening Remarks given during the NBioERESD Program Covenant of Partnership Signing held on 26 January 2018 at the University Hostel, MMSU, City of Batac, Ilocos Norte.

Agrupis, SC et.al 2017. Village scale Production of MMSU Hydrous Ethanol as R&D in Biofuel Traials and Feedstock for Anhydrous Ethanol Production Terminal Report. MMSU and Department of Energy Partnership. MMSU, City of Batac, Ilocos Norte.

Cuyno, R. 1998. Training Modules on Research Management. Overview of the Philippine Research Systrem. Research Management Center, University of the Philippines Los Banos, College, Laguna.

_____ DA-BAR 2016. Research and Development, and Extension Agenda and Programs (RDEAP 2016-2022), Diliman, Quezon City.

Denscombe, M. 2010. Ground Rules for Social Research. Guidelines for good practice. Open University Press. McGraw-Hill Education, McGraw-Hill House, Shoppenhangers Road, Maidenhead Bershire, England SL6 2QL

Ducker, P. 1973. Management: Tasks, Responsibilities and Practices. Routledge Publication. USA.

Gatchalian, ST. 2018. Inspiration Message shared during the NBioERESD Program Covenant of Partnership Signing held on 26 January 2018 at the University Hostel, MMSU, City of Batac, Ilocos Norte.

McDonald, D. 2014. “The Firm: The Story of McKinsey and Its Secret Influence on American Business”.

Simon and Schuster – via Google Books.

_____ MMSU Annual Reports for 2008, 2010, 2011, 2013, 2015 and 2016. MMSU, City of Batac, Ilocos Norte.

_____ MMSU-USAID STRIDE Project Completion Report. 2017. MMSU, City of Batac, Ilocos Norte. _____ National Bioenergy Research and Extension for Sustainable Development Program Operational Framework. 2018. National Bioenergy Research and Innovation Center, MMSU, City of Batac, Ilocos Norte.

Peters, T. (1980). The Planning Fetish. Manager’s Journal,” Wall Street Journal.

_____ Republic Act 9367 Document. 2006. The Biofuels Act of 2006. Congress of the Republic of the Philippines.

_____ Republic Act 9729 Document. 2009. The Philippine Climate Change Act of 2009. Congress of the Republic of the Philippines.

_____ Republic Act 9136 Document. 2001. Electric Power Industry Reform Act of 2001. Congress of the Republic of the Philippines.

_____ Republic Act 9513 Document. 2008. Renewable Energy Act of 2008. Congress of the Republic of the Philippines.

Waterman, R. H., Peters, T. J., & Phillips, J. R. 1980. Structure is not organization. Business Horizons, 23(3), 14-26.