



## THE RESEARCH, DEVELOPMENT, EXTENSION AND TRAINING EXPERIENCES OF MARINDUQUE STATE COLLEGE, PHILIPPINES: BASIS FOR EXCELLENCE IN EDUCATION

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### Abstract:

*The study showcases the development of the R&D Unit of Marinduque State College (MSC) which started from almost zero budget into a thriving research institution to produce research outputs that were accepted and presented here and abroad. Documentary analysis was the methodology employed by the researcher reinforced by interview for supplemental data. The paper appraises the last 17 years performance of the College with regard to the number of research outputs made and presented in the local, regional/national and international conferences, the number of faculty members actively engaged in research, the number of published and reviewed papers and funded R&D proposals. Further, the extension activities to different communities in the province are also included in the study as well as the training services conducted by the College. Findings revealed that through the years, the RDE productivity of the College increased in terms of research outputs highlighting the attendance to various conferences, funded projects and published papers. In addition, extension activities and training development evidently contributed to the performance of the College with major increase also in numbers. Now that the College is aiming to become a university, wherein conducting different RDE activities is one factor that is being looked into to attain such goal, this paper is useful for this purpose.*

**Keywords:** Development; Higher Education; Research Productivity; Technology Transfer; Training.

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### 1. Introduction

It is a well-established concept that knowledge is an indispensable factor for development, thus in our so-called 'knowledge society' [1], institutions of learning are continuously serving as conduit of formal and informal knowledge.

It is universally accepted that outmoded teaching styles and outdated subject matters contribute a lot in producing poor quality graduates, thus faculty members in colleges and universities or the so-called institutions of higher learning are advised to carry out relevant research to be partners in the development of one country [2]. With this urgent need, all state universities and colleges (SUCs) are mandated to perform four primordial functions, such as instruction, research, extension and production.

It is believed that proper balanced in these functions will create a balanced human capital equipped with knowledge and skills and values to be productive individuals. Before, there were three primordial functions that SUCs must perform and later on production was added.

It is presumed that the origin of these functions in the Philippines was in early 1900 with the opening of the University of the Philippines College of Agriculture [3], [4]. But, it is believed that this was patterned after those of the land grant colleges and universities in the USA [5].

Parallel to this, in the work of Boyer [6], universities and colleges in the U.S. and Europe centered their activities on teaching (instruction), discovery (research), application and integration. The same functions are related to the functions of the SUCs.

But, among these functions, research is seemed the most primordial, because it is the foundation of new knowledge that can be transformed into skills and in the long run can be shared or disseminated to increase production and finally development [7].

In order to strengthen the role of SUCs toward development of the country, Higher Education Modernization Act of 1998, also known as R.A. 8292, mandates state universities and colleges (SUCs) to establish research and extension centers for the promotion of their development.

This act was complemented by National Budget Circular No. 461 clearly indicating the four functional areas of SUCs that did not limit them into “teaching colleges and universities”, but more into research and development-oriented institutions of higher learning for them to move on into sustainable institutions economically and academically.

In line with this, the Medium-Term Development Plan for Higher Education, 2005-2010 (MTDPHE, 2005-2010) articulates and stresses the role of higher education system in the attainment of the national development goals of the country through its three main functions namely: human resources development (HRD), research, and extension [8].

The MTDPHE recognizes the most pressing challenges faced by the higher education system, in which research was given with such importance, by reorienting R&D works towards systematic and purposive utilization of research outputs in order to generate employment and support poverty reduction, especially in the countryside [8].

With the above premises, this study looked on the research productivity of MSC for the last sixteen (16) years, e.g. 2000-2016, which can be a basis for its bid to become a university.

Specifically, the study looks on the number of research outputs the college-researchers made, the number of papers presented in conferences, number of papers published and reviewed and funded R&D proposals, budget and expenditures, extension and training services unit accomplishment.

## **2. Materials and Methods**

The data that were used in this paper were lifted from the records of the Office of the Vice President for Research and Extension (OVPRE), from the College R&D Information System, through the Center for Scientific Information Management and from the collected information of faculty members who worked in the unit since it was established.

Direct interviews of some of the faculty members were done, because of the limited documentation and written reports in the department.

The historical development was gathered from the minutes of the BOT Meetings and those filed in the Human Resources Management Office, while others were gleaned from the College's annual reports.

Budget Allocations and Expenditures for the Research Unit were requested from the Office of the Budget Officer, and SWOT Analysis was also utilized.

## **3. Results and Discussions**

### **3.1. Historical Background of the College R andD**

As per Section 2 of Batas PambansaBlg. 377, the former Marinduque School of Arts and Trades (MSAT) was made into Marinduque Institute of Science and Technology on 8 April 1982. It was indicated that along its four-year Secondary Education, two-year Trade Technical and four-year Bachelor of Science in Industrial Technology curricula, research and advanced studies should be promoted along the areas of agriculture, mining, fisheries, engineering, allied technological courses and education.

In 5 January 1990, by the virtue of RA 6833, MIST was converted to Marinduque State College (MSC), which further calls for the enhancement of research as one of the primordial functions of SUCs along with instruction, extension and production. [9].

Furthermore, new campuses and curricular offerings were established when RA No. 7319 was approved on 30 March 1992 for the School of Agriculture in Poctoy, Torrijos, School of Fisheries in Gasan and the transfer of the former Marinduque Community College in Sta. Cruz as MSC-Sta. Cruz.

In view of these developments, the R&D Unit of the College was organized in August 1993 as a separate entity, because before it was fused with the Extension Unit as Research and Extension Unit under the directorship of Mr. Romeo Magcamit.

Due to the separation of the two major functions, Mr. Respicio Javier, the late Vice President proposed that the Research Unit be manned by Mr. Panchito Labay, its first director, in 15 June 1993. The unit started from scratch, wherein papers and even typewriters were borrowed from other offices to do the paper works during the night. Because some of the faculty members were loaded with teaching subjects, wherein some had 30 teaching hours per week, the Director trained the senior education students in the chemistry and biochemistry to do research and fieldwork [10].

In 1995, during the term of Dr. Teodoro Garcia, the second College President, the butterfly research project was proposed and was presented in the budget hearing for SUCs in Batasan Pambansa. The project got the attention of the late Sen. Raul Roco and proposed a Php 2.0M budget for the R&D Unit of the College [10].

The said budget was released in 1995 during the time of the third president of MSC, Dr. Rodrigo Monterey Sr., which created also the Research and Extension Building, renovated from the old ADB Building.

A lot of funded proposal was made by its first Director, wherein two specialized laboratories, the Environment Monitoring Laboratory, was established in 1996 with a funding of Php 0.5M and the Ceramics Laboratory in 1998, which was funded by TESDA, DOLE and DOST worth Php 1.8M, plus the additional Php 0.8M for training of displaced workers, rural mothers and out-of-school youths [10].

In 1999, another proposal named “Perasa Paru-paru” (Money from Butterflies) was funded by World Bank through the DOLE at a cost of Php 0.5M [10].

In 20 July 2000, the MSC-BOT approved Resolution No. 15 creating the Technical and External Affairs Department (TEAD), which integrated the three functional functions. The department was originally composed of research, extension and linking units and the first VP of TEAD was Dr. Carlos Andam. That was also the time that the College became a member of Southern Tagalog Agricultural Resources Research & Development Consortium (STARRDEC) [9].

In that same year, the first research paper of the College in R&D symposium/conference landed as second best paper, which was about butterfly farming by Mr. Panchito Labay. For poster paper presentation, the first winning R&D project was that of Dr. Virginia Sotto, about coconut and malunggay products made into nutritive drinks.

In that same year, the management of the College decided to place the External Affairs under the R&D Department’s supervision in view of its vision to harness the support of the alumni, local and national government agencies, non-government organizations, private companies and international agencies to support the development of the faculty engaged in research and extension activities, the college and the province as a whole [9].

In 2003, the MSC-BOT authorized a Management Review Team (MRT), including a Curriculum Review Team that studied the organization, management and programs of the College. The MRT recommended the realignment of two units of the department, leaving the Research Unit

and Extension Unit under an Office of the Vice President for Research, Extension and Linkages (OVPREAL).

Consequently, the Board approved this recommendation on 16 January 2004 through MSC-BOT Resolution No. 4, Series of 2004 [11]. The latest reorganization was endorsed by Administrative Council (ADCO) in April 2006 and subsequently approved by MSC-BOT placing under its supervision two specialized units and two support services units. The acronym of OVPREAL was likewise shortened to Office of the Vice President for Research and Extension (OVPRE) [9].

During the time of Dr. Isidro Sotto, majority of the R&D Projects were continued under the leadership of the department's first Vice President, Dr. Carlos Andam.

In 2005, per BOT Resolution No. 13, Dr. Romulo Malvar, became the 5<sup>th</sup> President on 25 March 2005 and the first ever re-elected President in 2010. Under his term, income-generating projects related to research were introduced. His major aims are to showcase mature technologies developed by researchers and also to enhance financial viability of the department and the College as well.

Under his term, faculty members started presenting their research papers not only in the national conferences, but more in the international conferences. Thus, in 2006, two paper were presented in the Catholic University of America, Washington DC, through the invitation of Ford Foundation International Fellowships Program.

In 2009, three papers were presented in Mahidol University, Bangkok, Thailand and in 2010; four papers were peer-reviewed and accepted for presentation in London, Great Britain about climate change.

Year 2012 marked the history of MSC with the highest number of papers presented in local, national and international conferences. It was also in the same year when the Research and Extension Manual was approved by the BOT (MSC BOT Res. No. 120 S. 2012) which aims to standardize and intensify the conduct of Rand E among faculty members, personnel and students of the college.

### **3.2. The Faculty Members as the Backbone of R&D**

The faculty members are and always considered as the most important assets of colleges and universities in building their research base and capabilities. They are the driving force behind programs of teaching and research. The university [college] is specifically charged with and expected to make significant contributions through research, thus in the province of Marinduque with the presence of Marinduque State College, being the only state institution, is charged with this function [9].

It is a fact, the faculty members in the colleges and universities have to be considered as scholars and not just mere teaching mentors. Thus, it is a long established belief that research and teaching are complementary to each other [12].

As such, leaders in education have indicated that research activities enhance the faculty members' knowledge and increase their enthusiasm to share such knowledge with the students [13] that all of which enriches the student learning experience.

With these premises, the performance of the faculty members as the human capital in research was assessed.

At present, there are 193 regular and temporary faculty members the College has. It has also 58 contracted instructors distributed in the eight academic schools in the three campuses.

Of this number, only three are considered as full-fledged professors, while 31 are Associate Professors, 36 are Assistant Professors and 43 are Instructors.

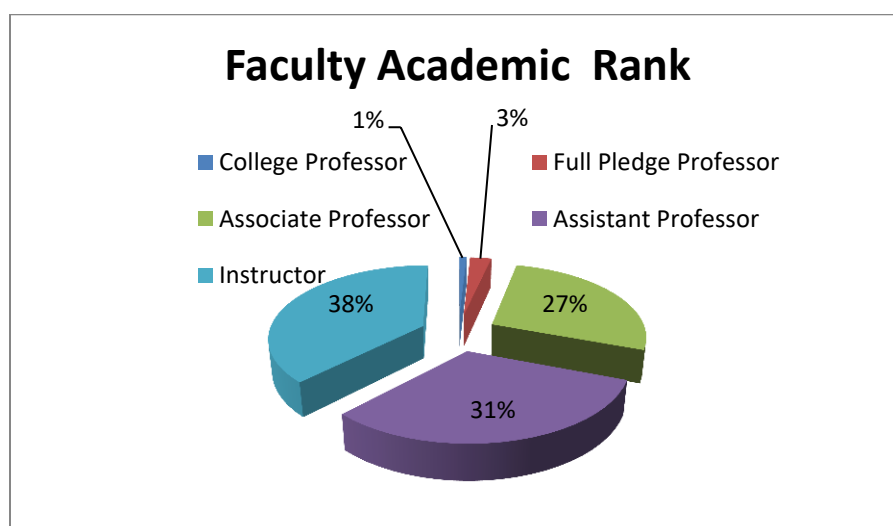


Figure 1: Profile of Faculty Members based on their Academic Ranks

It is indicated that majority of the faculty members in the College are Instructors, but it is nice to say that research can cut across academic ranks, there are instructors who have papers presented in different international and national conferences.

At the start of the R&D Unit, there were only two researchers who were conducting research or have research papers—the R&D Director and one faculty who was the GAD Director then. Their papers were first published in the first research journal of the College in 1994—the BuslongMarinduque.

Even until now, few faculty members are engaged in research, which according to them they did not have time to do so, because some have 24-30 teaching hours per week. Others cited that from 2008 to present, the prevailing policies of the department have affected the faculty members' interests in research. Their stiff policies are presumed not conducive, especially to budding faculty researchers.

With regard to professional degree finished, the College has 21 doctors, 13 of which are PhDs, 6 are EdDs, and 1 is DBA and 1 DPA.

With these numbers, six have accepted and presented research papers in the national and international conferences including two published papers in Mahidol University, Thailand and two in the local research journal.

One faculty member with Master of Science degree abroad and now a full-fledged professor has a total of 18 reviewed and accepted papers internationally, eight papers accepted nationally and six papers presented locally. To date he has 32 published papers, majority of which are about butterflies and the environment, phytochemistry / phytoremediation and related social issues.

To encourage more researchers to conduct and publish their research works, the PMS-OPES of the College has given research with high points ranging from 24 to 80 depending on the level, whether local, national or international, published in the journal or not.

At present, the College has five duly approved research journals that were approved by the BOT and registered in the National Library with matching ISSN Number. These are The Marinduque State College Journal of Research and Innovation, The Marinduque State College Journal of Engineering, Environment and Technology, Arthropoda Marinduqueña, Marinduque ISLE (Island Sustainable Living and Environment) and The Marinduque Research Review. The Frontiers, the Official Publication of OVPRE evidently stayed in the circulation for four consecutive years, from year 2004 to 2007. The Marinduque State College Journal of Research and Innovation resumed its publication in 2015 with 6 published papers.

### **3.3. Performance of the College R&D**

As far as research productivity is concerned, there is no consensus yet on the alternative measurement on the quantity or number of research paper as a gauge for research productivity. Hence, research productivity in terms of the number of researches and publications still prevails in many research institutions throughout the world. It is also becoming a measure of the strength and productivity of academic institutions, as it is an important element in the equation for excellence [9].

In addition, through the faculty members' research publications in the major journals; they also disseminate their research findings to the target beneficiaries in the community and industry. Such scholarly activity brings visibility and prestige to the researchers and their institutional affiliations [14].

During the first quarter of 2000, the task of organizing a R&D Department was assigned naturally to the Vice President for Research and Extension. The President then that time said that he would like to complete the College. The attempts to organized was evident from the history of the College, for example the designation of an Extension Director and later on a Research Director and even designating other faculty members to assist the Directors, but the initiative did not successfully worked out.

In the same year, the VP for R&D sent 10 faculty members to attend a training-workshop on research proposal preparation writing organized by University of the Philippines Los Baños and the Commission on Higher Education. Two of the faculty members eventually made it to do

research. In the ensuing years, training-workshop was organized in MSC on same topic with resource persons coming from the Philippine Council for Industry and energy Research and Development (PCIERD). Around 30 faculty members attended and 4 of them are doing it now. University of the Philippines Diliman came over and conducted another seminar on research attended by some 25 faculty members. Some of them made it. In addition, the Vice President personally assists faculty members who are showing interest on R & D and this approach seems to be more effective.

In year 2000 and also in consonance with the College's membership in the Southern Tagalog Agriculture and Resources Research and Development Consortium (STARRDEC), the Annual Regional Symposium on Research and Development Highlights was hosted by the College on 24 August 2000 in Boac Campus. Only one research paper and two posters were presented during this symposium, but one landed as second best paper during that occasion.

As a STARRDEC member, the First Agency In-House Review (AIHR) of MSC was conducted in the year 2002. Spearheaded by TEAD of the College, research productivity was noted at 15 studies and one research project proposal from various research and development units in the province including the Philippine Rural Reconstruction Movement (PRRM) and units of the provincial and municipal governments although bulk of the studies reviewed were expectedly done by the faculty members of the College [15].

A total of 28 studies were reviewed during the second AIHR on 26–27 February 2004. Significantly, this feat places MSC in the forefront of R&D in the province of Marinduque. Four studies came from the Department of Education in the province and the rest from MSC's faculty members [15].

In April 2006, the MSC-STARRDEC Agency In-House Review was organized and conducted wherein only seven studies were reviewed.

It is important to note that most of these studies were not provided with funds from the College or from other sources, thus it is an indicator that research has been a passion by the research cultured faculty members.

With such findings, the STARRDEC elevated the membership of the College from associate to regular member. STARRDEC also suggested that the faculty-researchers be given with some form of incentives like honoraria to compensate the good work that they have done for the College and the community, and since 2009, the college become members of the Southern Tagalog Island Research and Development Consortium (STIRDC) and MIMAROPA Health Research and Development Consortium (MHRDC) respectively.

As shown in Figure 2.0, there was a sudden increased in the number of research papers in 2001 and 2004 and dips were recorded in 2006, 2008 and 2010. Interests in research were found evident in the next seven years (2011-2017).



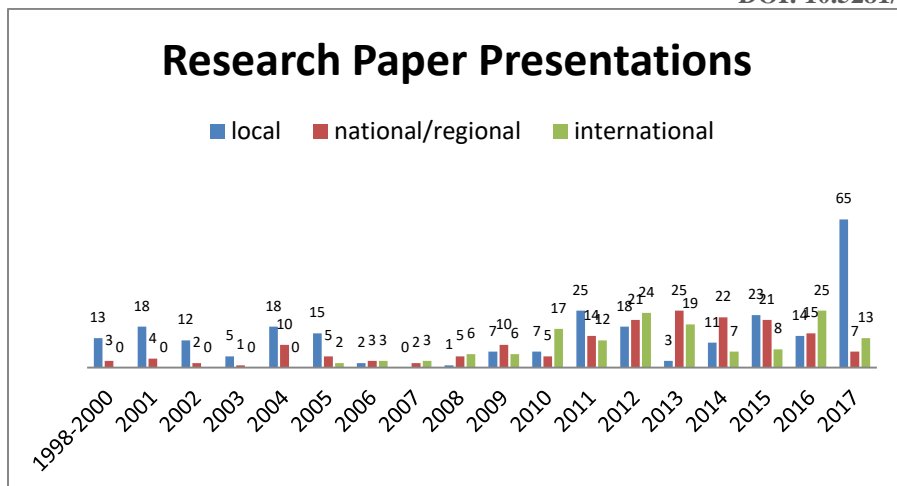


Figure 2: Research papers accepted and presented in the local, regional/national and international conferences

This can be presumed from the changes in the policies of the R&D Department during those periods. When the agency in-house review (AIHR) was stopped somewhere in 2006, the faculty members did not present anymore their papers in the local committee.

One faculty-researcher commented that the created local committee's comments are not supportive to their outputs but rather discouraging and intimidating, especially to the budding researchers. Thus, at the start of 2006, they targeted more the national and international conferences rather than presenting their works before the local committee.

Despite the non-compliance of the faculty-researchers to the policies being imposed by the present leadership of the Department, they were not battered by such restrictions, because research according to them is already their passion. They feel that research is a part of their academic commitment to the students, to the community people and to the College. As they conduct research, their creativity and analytical thinking is enhanced which they share these findings to the students.

With regard to utilized research outputs, the butterfly research outputs are the most accepted ones as these are applied by 220 farming households and traders who are engaged in this livelihood.

The root crops research, especially arrowroots and other traditional root crops that are made into bakery products is also gaining prominence, side-by-side by the phytochemical research on herbal medicines, like "tawak", snake anti-venom concoction and "og-og plant and the phytochemical research on traditional plants as "pharm vegetables". Among the research outputs that gain national prominence also is the breadfruit flour production into baked delicacies, which is one of the offshoots of Dr. Malvar's research ideas.

It can be noted that in year 2011-2017, under the leadership of the new Vice President for Research, Extension and Development Department boosted its performance.

Presentations were held through joint activity for Pre-University Symposium and 1st College Wide Research Review. Papers tackling climate change, poverty alleviation, mitigation and postharvest were highly recognized that year. Among the presentations, the chosen best papers were about butterfly research, buntal industry and language and communication.

In the year 2012, the collaborative efforts from the academic community and research environment continue for the College to strengthen its accountability to be a research-oriented university. Presentation of paper in Indonesia highlights this year and two research project proposals were approved and granted funding by DA-BAR and DOST this year especially under agriculture and food security particularly arrowroot and nito projects. Research on food and environment garnered awards for this year.

In the year 2013, the endless support of the OVPRE made the College got 7 research awards in international, national and even regional presentations. Three health researches were also approved and funded by the MIMAROPA Health Research and Development Consortium which focused on essential intrapartum, ixora cultivar and food products from malunngay, coconut flour and ginger. One student research also made it to the PCIEERD Electronic Design Competition from the School of Engineering. The tamarind project proposal was also submitted to PCIEERD and was subjected to revisions. The OVPRE is really fruitful in terms of linkaging and projects which make the College bear more projects and collaboration with other agencies and SUCs.

In year 2014, 4 regional awards were received. That year also, the R&E Department conducted the Capability Enhancement Seminar-Workshop in Research Proposal Writing wherein there were 8 research proposals generated from the faculty researchers who attended the workshop.

In year 2015, local presentations were made through the 6th College Wide Research and Extension In-house Review and the 1st Marinduque Science and Technology Conference. Among those papers presented in different conferences, papers about food, environment and fisheries garnered 6 research awards.

As MSC continues to boost its RDE productivity in the year 2016, presentations in Thailand, Japan, Indonesia and Malaysia highlighted the accomplishment for this year. This is the MSC's R&D response in the ASEAN integration challenge we are facing now aside from the targets for PBB and SUC Leveling.

In year 2017, presentations in Japan and Taiwan about native pig and shrimp highlighted the accomplishment for this year. This year has the highest number for paper presentation because the College accomplished all the PBB targets where majority of the papers were about management and education. The endless effort and dedication of the VP for Research, Extension and Development made it to top the target for this year.

### **3.4. Research Fundings and Support**

To materialize the research projects, the College commits itself by providing funds as well as incentives to researchers. Research projects and other expenses for the unit are funded by the

government and the college. The budget allocated to those came from Fund 101 as per DBM line item budget and Fund 164 from the income of the College.

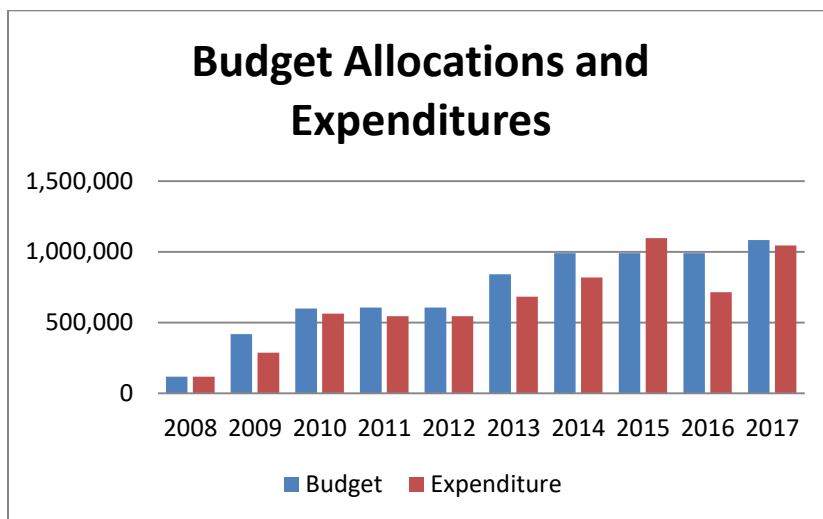


Figure 3: Budget Allocations and Expenditures of the Research Unit from the Fiscal Year 2008 to 2016

There is an increase of expenses for the last five (5) years since researchers are engaged with different research activities (Figure 3.0). As of year 2016, there were expenditures exceeded the total budget allocated for the unit. This proves that the unit dynamically performs their task as they were engaged with local, national and international research activities.

The College classifies researches according to their source of fund: a) College Funded through R and E Program, b) Outside Funded (College Supported Programs that were endorse to other funding agencies and c) Commissioned/Directed R and E Programs where the researcher where directly commissioned by other funding agencies.

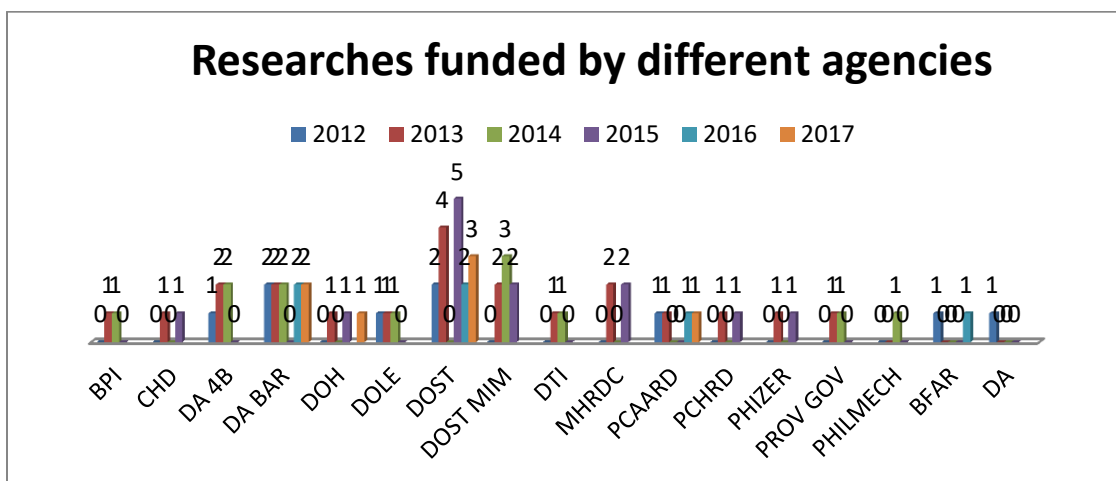


Figure 4: Number of Researches Supported by Other Agencies for the year 2012 to 2017

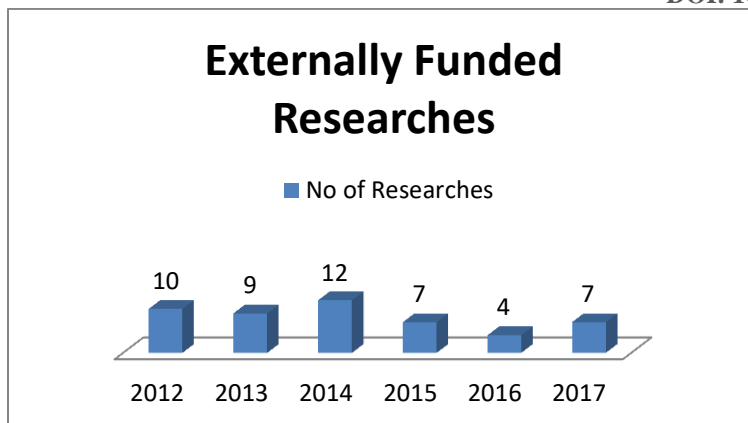


Figure 5: Number of Researches Funded by Other Agencies from the Year 2012 to 2016

Marinduque State College collaborates with various government and non-government agencies. They host research projects authored by MSC researchers. They monitor and coordinate its funding and implementation. Figures 4.0 and 5.0 show the number of researches supported by other agencies for the year 2012 to 2017. The major researches funded by different agencies include the oyster mushroom, solar salt, bagoong and patis, nito which are funded by DOST-MIMAROPA, arrowroot and breadfruit which are funded by DA-BAR, cocogingay (coconut, malunggay and ginger) food products funded by PCHRD-MHRDC, native pig funded by DOST-PCAARRD, ixora cultivar funded by CHD IVB and intrapartum implementation by Pfizer. The new projects approved in 2017 were the abalone project funded by DOST-PCIEERD and the carbon neutral garden and oxygen project in collaboration with DOH.

So far, the native pig program of the College has garnered the major outsourcing activity wherein it started with 52 million pesos and counting. Being the lead agency, the program has 7 participating SUCs/agencies all over the country which include the Benguet State University, Kalinga State University, Eastern Samar State University, Isabela State University, Nueva Viscaya State University, University of the Philippines Los Baños, Bureau of Animal Industry. To date, the project is constructing the Native Pig Artificial Insemination Laboratory and Native Pig Research Center.

### 3.5. Performance of Extension and Training Services

Increasingly, high performing organization today are recognizing the need to use best training and development practices to enhance their competitive advantage [16]. Through the years, the Extension Unit also made the R&E Department excel by conducting different extension and training to communities in the province. Most of the extension projects are about butterfly conservation, food processing and tutorials.

Under the new leadership, the Training Services Unit has conducted different trainings since 2016. There were 7 trainings conducted in that year which include research proposal writeshop, campus security management, supervisory course track, cocolisap training and proposal packaging.

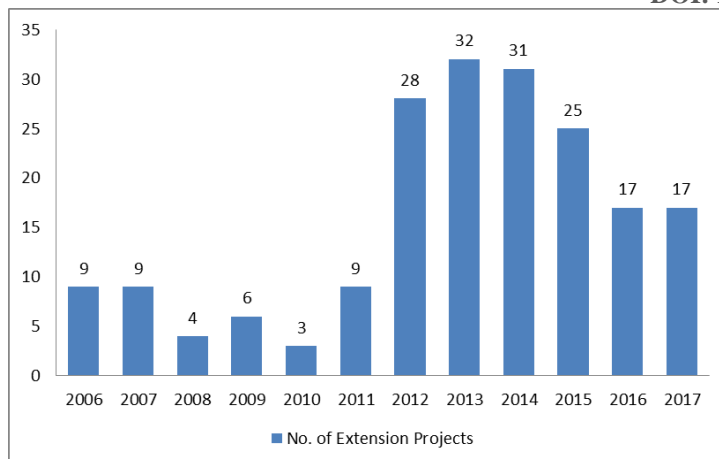


Figure 6: Number of Extension Projects from the year 2006 – 2017

In 2017, the workshop and training provided by the Unit include campus safety management, social media communication, test question and art of questioning, personality development, proposal writing workshop, industrial automation, Open Data for Research Advocacy and Policy Reforms, sexual harassment and other educational seminars. To date, the Training Services Unit are profiling the needed training by the faculty members and staff in line with the development plan of the College to equip them with necessary skills and knowledge to be able to perform their functions efficiently.

#### 4. Conclusions and Recommendations

Research is really the crux of human development, a human product that spawns more products that can bring changes to the socio-cultural, economics and environmental dimensions of development. Thus, it is considered as one of the prime functions of SUCs, which strike the difference between a teaching college or university and a performing college or university.

According to the results of the study, the following observation might be considered by the Administration: For the Marinduque State College to reap more the benefits of research toward its bid for university hood, it is important that the cited R&D projects have to be continued. These projects of the College can have a “trademark”, which is unique and not in duplication with other SUCs and can help the College to have its own niche as far as R&D is concerned. These are also the resources that can be found in the province, which can be further enhanced to gain an international prominence.

A research policy that is conducive to the researchers must be agreed between and among the present leaders of the department and the faculty-researchers in order to remove the differences between them. The policy should be made empowering, encouraging and energizing, because autonomy, accountability and creativity are peculiar characteristics of cultured researchers. Research productivity can be made spontaneous and naturally occurring when conducive policies and environment for the researchers are in place. Faculty, personnel and students must be encouraged to engage themselves in research activities. Have them join research capability activities

Budget allocated for research unit and its activities are limited considering the number of research activities and paper presentations in and out of the country. Full support from funding agencies is a big factor for the realization of MSC researches.

The college’s research journals and scientific papers gave realizations to the principle “unpublished research is not a research”, for research papers must be published for wide dissemination. Research projects must be well monitored and recorded through documents and reports, since through SWOT analysis, we came up with the following intervention:

Objectives	Key Result Areas	Performance Measures
1. To conduct research on food & agriculture sustainability for poverty alleviation	<ul style="list-style-type: none"> <li>a. Organic &amp; Indigenous / Traditional Food Production</li> <li>b. Supply and Demand Positioning in the Market</li> <li>c. Generation of Income &amp; Livelihood</li> <li>d. Graduate employability &amp; Tracer studies</li> </ul>	<ul style="list-style-type: none"> <li>a. Flagship projects on 4 traditional agri. crops, 5 fishery products &amp; 4 studies on native pig &amp; chicken prod</li> <li>b. 5 studies on market positioning</li> <li>c. 3 studies on related livelihood</li> <li>d. 3 employability &amp; tracer studies</li> </ul>
2. To improve environmental security of the island province of Marinduque	<ul style="list-style-type: none"> <li>e. Forestry &amp; Aquamarine Conservation</li> <li>f. Rehabilitated/Vegetated Mined-out Areas</li> <li>g. Alternative Energy</li> <li>h. Ecotourism Development</li> </ul>	<ul style="list-style-type: none"> <li>e. 4 studies on conservation</li> <li>f. 2 developed technologies on rehabilitation</li> <li>g. 3 studies on alternative energy</li> <li>h. 2 studies on ecotourism</li> </ul>

Figure 6: MSC Research Objectives. KRAs and PMs

Objectives	Strategies	Programs & Activities
1. To conduct research on food & agricultural sustainability for poverty alleviation	<ul style="list-style-type: none"> <li>a. Baseline Data Analysis (Previous R&amp;D Outputs)</li> <li>b. Training Needs Analysis of possible research/technology adopters</li> <li>c. Resource Generation</li> <li>d. Capacity Building</li> <li>e. Supply &amp; Demand Positioning</li> </ul>	Flagship projects on Rimas (breadfruit), arrowroot & other rootcrops, nito & handicraft materials, native pig & chicken and fishery products development (bagoong, salt, dried fish, <i>manakla</i> shrimps, etc.). Employability & tracer studies
2. To sustain environmental security of the island province of Marinduque	<ul style="list-style-type: none"> <li>a. Natural Resources Data Assessment</li> <li>b. Capacity Building</li> <li>c. Resource Generation</li> <li>d. Ecotourism Niche Building</li> </ul>	Flagship projects on butterfly research & related livelihoods, bamboo farming & other forest resources conservation, development of ecotourism sites, clean energy and waste utilization

Figure 7: Objectives, Strategies and Programs/Activities

As shown in Figures 6.0 and 7.0, the research unit focuses on two main objectives: 1. *To conduct research on food and agriculture sustainability for poverty elevation* through the following programs: utilization of local food resources such as root crops (Rimas, arrowroot), meat (Native Pigs and Chicken) and fish products (Bagoong, Dried Fish, Manakla, abalone). and 2. *To improve environmental security of the island province of Marinduqeto* be realized by the following activities: butterfly research and related livelihood, utilization of forest resources, ecotourism and pro-environmental projects.

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